

When 'I' is replaced by 'we', even 'illness'  
becomes 'wellness': Exploring pharmacists'  
interprofessional practice to better prepare  
pharmacy students for interprofessional  
collaborative working

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## Declaration

This work has not been submitted in substance for any other degree or award at this or any other university or place of learning, nor is being submitted concurrently in candidature for any degree or other award.

Signed:  (candidate) Date: 19/12/2018

### STATEMENT 1

This thesis is being submitted in partial fulfillment of the requirements for the degree of PhD.

Signed:  (candidate) Date: 19/12/2018

### STATEMENT 2

This thesis is the result of my own independent work/investigation, except where otherwise stated. Other sources are acknowledged by explicit references. The views expressed are my own.

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### STATEMENT 3

I hereby give consent for my thesis, if accepted, to be available online in the University's Open Access repository and for inter-library loan, and for the title and summary to be made available to outside organisations.

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## Summary

The drive to increase interprofessional teamwork in the healthcare environment has gained significant traction in recent years. This has partly been as a consequence of UK inquiries that have cited breakdowns in communication and teamwork as contributory factors leading to poor patient outcomes. One method to prepare practitioners for interprofessional teamworking is interprofessional education (IPE). The General Pharmaceutical Council specifies that IPE must be embedded within UK Master of Pharmacy (MPharm) programmes. However, there is a paucity of literature examining IPE related to pharmacy and limited knowledge of pharmacists' interprofessional interactions with healthcare professionals (HCPs). This makes it challenging for pharmacy educators to design IPE sessions that are reflective of practice. To address this, a mapping process was undertaken to identify IPE sessions that are delivered in UK MPharm programmes (17/29 schools responded). This identified significant variation in IPE sessions delivered in terms of learning outcomes addressed, topics covered, and the range of student HCPs involved. A mixed method study was then undertaken to explore pharmacists' interprofessional interactions in practice. A questionnaire was disseminated to pharmacists in Wales via community pharmacies (61.9% response) and hospital pharmacy departments (estimated 59.1% response). Analysis of returned questionnaires identified that although the extent of interprofessional collaboration varied pharmacists in both sectors most frequently interact with doctors and nurses. Semi-structured interviews were undertaken with pharmacists from both the community (n=14) and hospital (n=15) sectors to explore the nature of interactions. Using deductive and inductive thematic analysis, the nature of pharmacists' interactions with HCPs was elucidated, facilitators and barriers to interactions were determined and suggestions for IPE developed. Findings from these studies resulted in a series of recommendations for pharmacy educators and policy makers to facilitate pharmacists' interprofessional collaboration in practice and aid the development of relevant IPE that is of value to learners.

## List of Abbreviations

ACT	Accredited checking technician
BMA	British Medical Association
BP	Blood pressure
CAIPE	Centre for the Advancement of Interprofessional Education
CAS	Common ailment scheme
CBA	Controlled before and after study
CKD-MBD	Chronic kidney disease- mineral bone density
CPD	Continual professional development
CRM	Crew resource management
CSPPS	Cardiff School of Pharmacy and Pharmaceutical Sciences
CVD	Cardiovascular disease
DH	Department of Health
DMR	Discharge medicines review
D/T	Dispenser / technician
FY1	Foundation doctor - year 1
GDC	General Dental Council
GP	General practitioner
GMC	General Medical Council
GPhC	General Pharmaceutical Council
HCTM	Healthcare team member
HCP	Healthcare professional
HCPC	Health and Care Professions Council
HV	Health visitor
iOSCE	Interprofessional objective structured clinical examination
IPE	Interprofessional education
IPI	Interprofessional interactions
LHB	Local Health Board (in Wales)
MCA	Medicines counter assistant
MDT	Multidisciplinary team
MUR	Medicines use reviews
MPharm	Master of Pharmacy
MS Word	Microsoft Word 2011® version 14.4.9
NASA	National Aeronautics and Space Administration
NHS	National Health Service
NMC	Nursing and Midwifery Council

OSCE	Objective structured clinical examination
OT	Occupational therapist
RCT	Randomised control trial
RPS	Royal Pharmaceutical Society
SALT	Speech and language therapist
SCR	Summary of Care Records
SD	Standard deviation
SPSS	IBM SPSS statistics data editor® version 20
SW	Social worker
TOSCE	Team objective structured clinical examination
UHB	University health board
UK	United Kingdom
US	United States
UTI	Urinary tract infection
WHO	World Health Organisation

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## **Chapter 1 - Context of the thesis**

## 1.1. About this study

In recent years the World Health Organisation (2010) and the UK Department of Health (2013c) have recognised the need to improve interprofessional collaboration in order to provide patient-centred care. This desire was further increased following the publication of a number of UK inquiries (including those by Francis (2013), Andrews and Butler (2014), Kirkup (2015) and Carter (2016)) that cited breakdowns in communication and teamwork as contributory factors leading to poor patient outcomes. One method which aims to enhance interprofessional collaboration and teamworking in the healthcare environment is the provision of interprofessional education (IPE) through undergraduate and postgraduate studies (World Health Organisation, 2013). Although IPE is now a required element of the undergraduate UK pharmacy curriculum (General Pharmaceutical Council, 2011), there is still a paucity of published guidance and literature about IPE involving pharmacists or pharmacy students and similarly, a limited knowledge of pharmacists' interprofessional practice. This makes the design of IPE sessions that are meaningful, relevant and reflective of practice challenging for pharmacy educators. This study aimed to bridge these gaps. To do this an initial mapping process was conducted to determine the provision of IPE across UK schools of pharmacy. An online questionnaire was disseminated to IPE educators across all UK schools of pharmacy. This was followed by a mixed method study to identify and explore pharmacists' interprofessional interactions in practice. As this thesis was conducted within Wales (at Cardiff University) there was a specific focus on the experiences of pharmacists based within NHS Wales, which although devolved from other UK NHS organisations (i.e. NHS England) is still guided by procedures and policies produced by the Department of Health. This study initially utilised a self-complete questionnaire to determine both community and hospital pharmacists' perceived frequency of interactions with other healthcare professionals and wider healthcare team members (jointly termed HCTMs). Semi-structured interviews were subsequently undertaken with a range of pharmacists from both sectors to further explore these interactions, determining the nature of specific interactions with healthcare professionals (HCPs) pharmacists frequently interacted with (including the topic of interactions and the mode in which they took place), any facilitators and barriers to these interactions and suggestions for IPE. The ultimate aim of this thesis was to produce a series of recommendations for pharmacy educators and policy makers to facilitate pharmacists' interprofessional collaboration in practice and aid the development of relevant IPE that is of value to and supports learners. Whilst the Welsh NHS has some autonomy in its delivery its practice is primarily governed by the Department of Health and therefore it is likely that data gathered from these pharmacists based within

Wales may reflect that of pharmacists based within other UK principalities such as England, Scotland and Northern Ireland.

## **1.2. Organisation of the thesis**

Background literature informing the development and conduct of this study is presented in chapter 2. The chapter: outlines recent policy and practice changes that have resulted in a need for greater interprofessional collaboration across healthcare, with a particular reference to that between pharmacists and other healthcare professionals; examines existing literature related to pharmacist-HCP relationships, identifying gaps in knowledge; discusses the evidence surrounding why interprofessional collaboration is not currently the norm across healthcare environments; and explores the methods that have been used to try and improve interprofessional collaboration, with specific reference to the use of interprofessional education in the field of pharmacy. The chapter concludes by presenting the aims and specific objectives of the study.

Chapter 3 determines the current landscape of interprofessional education in schools of pharmacy across the UK. An exploration is undertaken of the types of sessions taking place in universities; who these sessions were conducted with; the timing of sessions and the topic explored; and methods used in assessing sessions or student progress.

Chapter 4 is the first of three chapters which explores pharmacists' interprofessional interactions in practice. This chapter focuses on the study design and methods used. It provides detail on the mixed method approach used within the studies (quantitative questionnaire and qualitative interviews); methods of sampling and selection; design and piloting of the research instruments; data collection strategies and recruitment; and the handling and analysis of data.

Chapter 5 presents the findings from a mixed method analysis exploring community pharmacists' interactions with other HCPs. An examination is made of the data gathered from a quantitative questionnaire to determine the HCPs that pharmacists most frequently interact with and explores the factors that influence such interactions, for example demographic and geographical characteristics. The chapter also details an analysis of data gathered from a series of interviews with community pharmacists. Here deductive and inductive thematic analysis identified the reasons community pharmacists interact with HCPs; the benefits these interactions can have for patients and the HCPs themselves; any barriers to, and solutions for, working interprofessionally with other HCPs; and the mode with which interactions take place.

Chapter 6 presents the findings from the mixed method analysis exploring hospital pharmacists' interactions with other HCPs. The same areas as chapter 5 were explored, however with the focus on hospital pharmacists' interactions with HCPs.

Chapter 7 concludes the thesis, providing an overview of the findings across the studies and discusses the similarities and differences between community and hospital pharmacists' interprofessional interactions. This chapter also, discusses implications for practice, education and further research, provides a series of recommendations for educators and policy makers that may serve to improve interprofessional collaboration and education, and describes how this thesis has directly impacted the authors own professional practice.

## **Chapter 2 - General introduction**

## 2.1. Chapter overview

Working as part of a team is an essential element of modern life in a number of domains. From an early stage in life we are encouraged to integrate into a variety of teams including for example in sports teams, communities of learning in schools and as we embark on our careers in the workplace. The overarching philosophy of the team is for individuals to work together, utilising each individual's skills to achieve a common purpose (Reeves et al., 2010a). This shared responsibility across the team to effectively achieve desired outcomes is synergistic producing further reach than when individuals act alone (Reeves et al., 2010b). Ultimately, a team's successes and failures allow for collective reflection and improvements in teamworking and outcomes (Jelphs et al., 2016).

In the healthcare setting, a range of professions work in concert to deliver patient care. In general, patients do not see the inner workings of such teams and arguably this is not an issue as long as their health needs have been met. However, when effective teamwork breaks down, the consequence may be that patient related outcomes are negatively impacted.

Within the United Kingdom (UK) healthcare is predominantly delivered through the National Health Service (NHS), a free at the point of use service that provides treatment for patients related to all aspects of their health and social care (Department of Health, 2010). In total the NHS employs 1.7 million people, which range from health and social care professionals to administrative and support staff, making it the world's fifth largest employer (Nuffield Trust, 2017). With such a range of professions working within the NHS to deliver a common mission, it is recognised that interprofessional teams must work together efficiently and effectively in order to optimise patient outcomes across the multitude of services delivered (Department of Health, 2013c; Carter, 2016). Effective interprofessional teamwork in this context maximises the utilisation of a range of HCPs (both generalists and specialists) working together to find solutions to simple and complex patient problems. However, coordination of interprofessional teams on such a large scale provides a challenge for the NHS because of a range of factors including the ingrained separation of HCPs in location, specialism, professional identity and values, and educational experiences (see section 2.4). Ultimately, the effective operation of teams in the healthcare environment can have significant consequences on patient morbidity and mortality. Indeed, a number of recent enquiries including those by Francis (2013), Andrews and Butler (2014), Kirkup (2015) and Carter (2016) have demonstrated negative consequences on patient outcomes directly related to ineffective teamwork (see section 2.3).

In this introductory chapter, an overview of interprofessional collaboration is provided, highlighting benefits to practice, barriers and facilitators to collaboration across a range of healthcare settings and the potential role of interprofessional education (IPE) in developing interprofessional practitioners. As the thesis will primarily address the role of the pharmacist in interprofessional teams, the introduction will include a focus on this area. Literature cited in this chapter was identified through a review process outlined in Appendix A.

## 2.2. Overview of key terminology

Before exploring the concepts of interprofessional collaboration and education it is important to acknowledge the terminology referred to throughout this thesis. In recent years there has been an expansion in research on interprofessional teamworking and education in the field of healthcare. As a consequence, there has been a proliferation of terms related to these concepts without a clear consensus on their use. Indeed, many studies use a range of terms to describe the same concept or conversely use the same terms to describe different concepts, something that has been highlighted in a number of review articles (Hall and Weaver, 2001; D'Amour et al., 2005; Reeves et al., 2010b; Jelphs et al., 2016). This thesis uses a common set of definitions, highlighted in **Table 2.1**, that have been defined by Barr et al. (2005), Jelphs et al. (2016) and Reeves et al. (2010a) and reflect those used in the Journal of Interprofessional Care.

Whilst there are a range of terms used throughout the literature this thesis primarily focuses on the interprofessional collaboration and teamworking that take place between health and social care professionals (HCPs) (rather than academic disciplines) in order to understand the ways pharmacists' work towards a common goal. The difference between interprofessional teamworking and collaboration is based on the level of integration of HCPs, whereby teamworking implies this occurs in a fully integrated manner, something which is in contrast absent in collaborative working. Whilst 'teamworking' may be desired (see section 2.3) limited research and varied terminology use makes the differentiation between the two (teamworking and collaboration) often difficult to determine, resulting in the terms often being used interchangeably to highlight professions working in partnership to achieve a common goal. The term interprofessional interaction (IPI) is also used within this thesis to highlight there is some element of engagement between HCPs however it does not reference the extent of this engagement. 'Interaction' therefore could range between teamworking (where HCPs have worked together, sharing knowledge and skills to solve issues in an integrated manner) to information transfer (where HCPs have communicated information however did not directly work together during this exchange).

**Table 2.1.** A glossary of the definitions used throughout this thesis identified within Barr et al. (2005), Reeves et al. (2010a) and Jelphs et al. (2016)

<b>Term</b>	<b>Definition</b> (* = definition adapted for use within this thesis)
<b>Healthcare professional (HCP)</b>	*Occupational professional groups who in general provide health and social services to others, such as pharmacists or social workers. It can be used as a term of self-ascription to avoid the need to apply regulatory criteria which differ between groups
<b>Healthcare team member (HCTM)</b>	*All professional and non-professional groups (i.e. administrative staff such as GP receptionists) who are associated with the delivery of healthcare, inclusive of all healthcare professionals
<b>Discipline</b>	Comprises of different academic disciplines (psychology, sociology, mathematics) rather than from different professions such as pharmacists, doctors, social workers etc.
<b>Collaboration</b>	An active and on-going partnership, often between people from diverse backgrounds, who work together to solve problems or provide services
<b>Teamwork</b>	An active and on-going partnership, often between people from diverse backgrounds, who share a team identity and work closely together in an integrated and interdependent manner to solve problems and deliver services.
<b>Interaction</b>	Any activity that involves direct engagement/communication with another person irrespective of the topic, frequency or nature (i.e. collaboration/teamwork)
<b>Information transfer</b>	*This is where an interaction has occurred (see above) however is purely focused on the transfer of information, with no direct collaborative working undertaken to jointly solve problems or provide services
<b>Interprofessional</b>	A term which describes any activity undertaken where there is a strong propensity for team members to interact across boundaries to actively work towards jointly solving a problem
<b>Multiprofessional</b>	Similar to 'interprofessional' but implies lower levels of cross boundary interactions, lower levels of collaboration and more 'side by side' working
<b>Transprofessional</b>	Similar to 'interprofessional' but implies complete integration of professionals across sectors utilising the same conceptual and methodological approaches thus promoting generic working: a process whereby the activities of one professional group are undertaken by members of another
<b>Intraprofessional</b>	Any activity which is undertaken by individuals within the same profession
<b>Uniprofessional</b>	Any activity undertaken by one profession alone
<b>Interprofessional collaboration</b>	A type of interprofessional work which involves different health and social care professions who regularly come together to solve problems or provide services.
<b>Interprofessional teamwork</b>	A type of interprofessional work which involves different health and/or social professions who share a team identity and work closely together in an integrated and interdependent manner to solve problems and deliver services.
<b>Interprofessional education</b>	An educational tool used where members (or students) of two or more health and/or social care professions engage in learning with, from and about each other to improve collaboration and the delivery of care

### **2.3. The need for interprofessional collaboration within UK healthcare practice**

Since its foundation in 1948, the NHS has been the centerpiece of health and social care in the UK. At its heart is the provision of a comprehensive service that is based on clinical need, available to all and free at the point of use (Department of Health, 2010). Across the UK the NHS is devolved and managed by each of the four independent countries: NHS Wales, NHS England, NHS Scotland and the affiliated Health and Social Care (HSC) in Northern Ireland. Whilst each of these nations have responsibility for the specific delivery of patient care the Department of Health (DoH) has a strong influence over the final policies across all four nations. Therefore, although this project primarily focuses on pharmacists who work within NHS Wales and thus references specific Welsh policy documents, NHS Wales often adopts the DoH guidance aligning them with the other three UK nations.

The NHS constitution published by the Department of Health (2009) states, among other principles, that it aspires to maintain the highest standards of excellence and professionalism by working in partnership across professions in the interests of patient care. However, in recent years a number of reviews have identified that the NHS is failing in some instances to reach these high standards and such reviews have frequently cited a failure in interprofessional teamworking as a contributory factor leading to poor patient care (Francis, 2013; Andrews and Butler, 2014; Kirkup, 2015).

The earliest of these reviews was conducted by Francis who investigated the Mid-Staffordshire NHS Foundation Trust between 2005 to 2008 over serious failings that led to the “appalling suffering of many patients” that included patients left in excrement, lack of privacy and dignity (even in death), patients denied requests for help, and food and water left out of reach (Francis, 2013). One key factor identified within the report which was paramount to the trusts failure to provide adequate patient care was the lack of effective interprofessional teamwork. A failure in communication between care sectors and HCPs was highlighted as preventing the active sharing of vital patient related information. Of note, there was an underlying assumption by many HCPs that monitoring, performance management and interventions were the responsibility of someone else due to a lack of understanding of roles and responsibilities. This was found to have significantly contributed to poor patient care. Furthermore, a fundamental lack of openness and transparency between HCPs was identified which ultimately limited sharing and communicating of information. This led Francis to recommend that “there needs to be effective teamwork between all the different disciplines” (pg.110).

Following publication of the Francis report, the Department of Health (2013c) responded with the publication of the 'Patients First and Foremost' document that underlined the importance of ensuring that the values and behaviours of HCPs were not siloed but rather they ensure a culture of open and effective teamwork. This was the first DoH publication to directly highlight the need for improved interprofessional teamworking across healthcare settings and was a clear priority with the then government health minister outlining a number of "Statements of Common Purpose" within the report that HCPs, alongside other care givers, must be committed to in order to improve UK healthcare delivery; the first statement of common purpose was "working together for patients" (pg. 9). The key feature underpinning these statements is that by getting HCPs to interact and collaborate in an interprofessional manner on behalf of the patients, individual strengths will be combined, professional knowledge shared, and healthcare teams will harbor a collective responsibility for the provision of quality patient care. This was reinforced in a supplementary document entitled 'Integrated Care and Support: Our Shared Commitment' also published by the Department of Health (2013a). The document stated that interprofessional teamworking needed to occur across all healthcare boundaries and settings to create a culture of cooperation and coordination between health, social care, public health and other local services. Similarly, the document stated that there must be an end to the institutional divide between physical and mental health services, and primary and secondary care. The desire to remove professional silos and better integrate interprofessional teams was neatly summarised; "too often, we don't communicate properly with each other, don't work together as a team or don't treat people as whole individuals. As a result, care and support is often fragmented, delayed or duplicated, which can result in missed opportunities to prevent needs from escalating and intervening early. This leads to poorer outcomes and experiences for the people who use our services" (pg. 6) (Department of Health, 2013a). The drive to integrate professions throughout health, education and social care and across both primary and secondary care was also highlighted in the 'Health and Social Care Act 2012' released by the Department of Health (2012) the year prior to the 'Integrated Care and Support' document, further cementing the DoH's desire to enhance collaboration across all aspects of care.

In 2014 attention was once again drawn to failings in interprofessional teamworking in a report published by Andrews and Butler (2014) that detailed an independent review of two hospitals within the Abertawe Bro Morgannwg University (ABMU) Health Board in Wales. This was a consequence of concerns that were raised relating to patient safety. Andrews and Butler found that there was (amongst other areas) poor professional behavior, lack of suitably qualified and educated staff, a disconnection between front-line staff and

managers, and confusion over leadership responsibilities and accountabilities. The report once again made a series of recommendations that reiterated the need for more cohesive interprofessional collaboration and greater levels of shared patient responsibility and accountability at all levels of patient care, with one recommendation specifically stating the need to make sure that “professional staff operate in cohesive clinical teams” (pg. 12). The ABMU board were also recommended to “develop more cohesive multidisciplinary team practice in the medical wards at the two hospitals, built around shared responsibility and accountability for patient care and standards of professional behaviour” (pg. 13) (Andrews and Butler, 2014).

In 2015, a review was published by Kirkup that detailed failings in the provision of care at the maternity and neonatal services within the University Hospitals of Morecambe Bay NHS Foundation Trust between 2004 and 2013. This review identified a number of serious failings within the trust which resulted in the unnecessary deaths of mothers and babies including (amongst other areas): substandard clinical competence; extremely poor working relationships, particularly between different staff groups, such as obstetricians, paediatricians and midwives; and failures of risk assessment and care planning that resulted in inappropriate and unsafe care. Kirkup also indicated that there was a culture of poor working relationships between HCPs that meant they were unable to work together effectively leading to repeated instances where HCPs failed to communicate important clinical information about individual patients to one another. He also cited a toxic “them and us culture” (pg. 13) as having a detrimental effect on team dynamics, and subsequently concluded that the breakdown in interprofessional collaboration was a key factor in unwarranted patient deaths.

Following these independent enquiries, the DoH published a further response entitled ‘Learning not blaming: The government response to Freedom to Speak Up, the Public Administration Select Committee report on clinical incidents, and the Morecambe Bay Investigation’ (Department of Health, 2015). Here they specifically noted the need to identify and develop measures that will promote effective interprofessional team working, believing that the removal of “inflexible demarcations between professional groups” (pg. 98) could help improve interprofessional care. This was reinforced in a review of the operational productivity of 136 NHS England acute hospitals conducted by Carter (2016) which found unwarranted variation in a range of key resource areas such as: clinical staff, pharmacy and medicines; diagnostics and imaging; procurement; back-office functions; and estates and facilities. One key finding Carter identified across trusts was the challenges related to delayed transfer of care and barriers to greater collaboration and cooperation,

which he found could “inhibit trusts’ ability to improve performance and result in sub-optimal clinical quality and efficiency across the local health economy” (pg. 8) (Carter, 2016).

Against a backdrop of these failings where interprofessional teamwork has not been effective, the potential benefits of interprofessional collaboration in the healthcare setting have been reported. For example, O’Leary et al. (2012) produced a general review article summarising the interprofessional working undertaken across hospitals, highlighting that teamworking across professions was critically important in the provision of safe, effective hospital care. They further surmised that hospitals with high teamwork ratings experienced higher patient satisfaction, lower hospital costs and higher staff retention, findings reiterated in the seminal ‘Working in Teams’ book by Jelphs et al. (2016). Of note, interprofessional interactions have been shown to have positive impacts in a number of domains including affording HCPs: (i) the opportunities to learn from one another (Freeth et al., 2008), (ii) recognise respective roles and responsibilities (Barrett et al., 2005; Freeth et al., 2008; Jacobsen et al., 2009) and (iii) build social relationships which make the work environment more pleasurable (Reeves et al., 2010b; Jelphs et al., 2016).

It is not just in the UK where the need for interprofessional working has gained traction. A number of recent publications by the World Health Organisation (WHO) have stressed the need for efficient and effective interprofessional collaboration across healthcare sectors in order to improve the delivery of patient care (World Health Organisation, 2010; World Health Organisation, 2013). The WHO stated in its ‘Framework for Action on Interprofessional Education & Collaborative Practice’ that having a strong, flexible and collaborative health workforce is one of the best ways to confront highly complex health challenges. Here it stated that interprofessional collaboration could benefit: family and community health; HIV/AIDS tuberculosis, and malaria; health action in crisis (i.e. in a provision of care in a humanitarian crisis); health security (i.e. responding to epidemics and pandemics); non-communicable diseases and mental health (i.e. working collaboratively to prevent and manage complex chronic conditions such as dementia, malnutrition and asthma); healthcare systems and services (i.e. through maximising the strengths and skills of HCPs, enabling them to function at the highest capacity, helping manage the strains placed on healthcare as a consequence of a shortage of healthcare workers)(World Health Organisation, 2010). The report highlighted that interprofessional collaborative practice can improve: access to and coordination of health-services; appropriate use of specialist clinical resources; health outcomes for people with chronic diseases; and patient care and safety, as well as decrease: total patient complications; length of hospital stay; tension and

conflict among caregivers; staff turnover; hospital admissions; clinical error rates; and mortality rates.

Collectively then, there is a national and international mandate for HCPs to build interprofessional healthcare teams in order to most appropriately utilise the skills and knowledge of a range of individuals to provide healthcare that meets the demanding needs of patients.

#### **2.4. How do pharmacists fit within the interprofessional team?**

One profession that has experienced a significant shift in roles and responsibilities over recent years is the pharmacy profession. Pharmacists, representing the third largest healthcare profession in the UK (General Pharmaceutical Council, 2018d), primarily practise within the community or hospital setting although there are specialist roles for example in the pharmaceutical industry or in academia and roles within the primary care sector which have seen significant growth in recent years (NHS England, 2014b; Welsh Assembly Government, 2015; General Pharmaceutical Council, 2018b). Pharmacists occupy a unique role as experts in medicines (NHS Health Education England, 2018) ensuring their safe supply from the dispensary setting and advising patients and HCPs on their safe and effective use (General Pharmaceutical Council, 2018d). Significantly, the independent report for the DoH conducted by Carter (2016) highlighted the need for greater incorporation of pharmacists within interprofessional teams in order to better utilise their clinical skills and improve patient care through their unique insight into medicines.

The General Pharmaceutical Council (GPhC) is responsible for regulating pharmacists, pharmacy technicians and pharmacies across the UK to assure and improve standards of care for people using pharmacy services. Therefore, although the NHS is devolved into the four independent UK nations (NHS England, NHS Wales, NHS Scotland and the affiliated Health and Social Care (HSC) in Northern) minimum standards must be met by pharmacists and pharmacies across the UK. This said, the drive to enhance the interprofessional integration of pharmacists has had a number of consequences for the role of the pharmacist in Wales including the development of new community pharmacy led services such as: discharge medication reviews (DMRs), smoking cessation services and flu vaccinations amongst others (Community Pharmacy Wales, 2018); greater access to patient care records (NHS Wales, 2018c); new hospital roles for example increased numbers of pharmacist prescribers and more time spent on patient facing medicines optimisation activities (as recommended by the Hospital Pharmacy Transformation Programme detailed by Carter (2016)); and integration of pharmacists in GP practices where they undertake

patient consultations to monitor and rationalise patients repeat prescriptions, improve medication adherence and conduct specialist reviews (particularly if they are prescribers) to optimise patients medications in a variety of clinical areas (i.e. anticoagulation, diabetes, etc.) (Primary Care Workforce Commission, 2015; Welsh Assembly Government, 2015). Although this has enabled pharmacists to expand their roles and responsibilities there has been a concomitant challenge for both pharmacists and other HCPs in understanding the position of the pharmacist within the interprofessional team. This lack of understanding of roles can be a significant barrier to interprofessional collaboration as HCPs are unaware of the ways pharmacists can benefit the interprofessional team (see section 2.4) (Hughes and McCann, 2003).

The apparent ambiguity of the pharmacists' role in both the public and professional conscious is not a new phenomenon. In a study conducted by Elvey et al. (2013), UK pharmacists (n=43) based within community, hospital and primary care settings were interviewed and found to have varied perceptions of their roles. The authors identified nine separate pharmacist identities: (i) the scientist; (ii) the medicines adviser; (iii) the clinical practitioner; (iv) the social carer; (v) the medicines maker; (vi) the medicines supplier; (vii) the manager; (viii) the business person; and (ix) unremarkable character. Elvey concluded as a result that pharmacists' have a lack of clear direction and ownership of what makes them unique as a health profession. Elvey also suggested that these varying perceptions also showed flexibility in pharmacists' view of their professional role. A similar finding was demonstrated by Schindel et al. (2017) using a mixed method approach (a survey (n=416) with Canadian community and hospital pharmacists and focus groups/interviews with a total of 75 participants including community and hospital pharmacists, pharmacy technicians, other HCPs and members of the public) which identified that: participants perceived that the pharmacist's role was transitioning to focus more on patient care; the varying consistency in pharmacists' uptake of more developed professional roles was reflected in the range of beliefs and expectations voiced by the general public; and pharmacists with expanded scopes of practice were assuming greater responsibility. Schindel also found that pharmacists viewed interprofessional collaboration and the development of strong relationships with other HCPs as essential for practice.

Although the role of the pharmacist in interprofessional practice is generally underexplored, there has been some attention on the interactions between community pharmacists and GPs. These include a UK study employing social network analysis to determine practitioner perceptions of interactions through interviews with both community pharmacists and GPs by Bradley (2012); mailed questionnaires determining

community pharmacists' attitudes towards becoming more active members of the interprofessional team in Canada by Dobson et al. (2006); a mixed methods study (small numbers of interviews and questionnaires) with community pharmacists and GP pairs to describe and identify the extent of the collaborative working taking place in the USA by Snyder et al. (2010); semi-structured interviews conducted in Australia with both community pharmacists and GPs to determine the extent of interactions and the impact pharmacy services have on these interactions by Van et al. (2011); uniprofessional focus groups with community pharmacists and GPs within Northern Ireland to explore the barriers between collaboration by Hughes and McCann (2003); and a survey distributed to community pharmacists and GPs in rural Australia to determine areas of commonality and barriers to collaboration by Norton et al. (2003). The results of these studies are detailed within chapter 5 (which explored community pharmacists' interprofessional interactions). However, in summary the studies generally show that although pharmacists and other HCPs recognise the value in engaging across professions IPIs are generally limited due to a range of barriers within practice. In addition, in chapter 6 the small number of studies addressing hospital pharmacists' interactions with hospital doctors and nurses are described. These include key informant interviews and reflective journaling from pharmacists, doctors and nurse practitioners to explore the interprofessional working relationships when providing team-based care in hospitalised medical patients in Canada by Makowsky et al. (2009b); focus groups with Australian nursing, pharmacy, and medical recent graduates to determine their perspectives and experiences of interprofessional collaborative practice and medication safety by Wilson et al. (2016). The findings from these studies generally echoed the studies that focused on community pharmacists interactions discussed above, with hospital pharmacists and HCPs once again recognising the benefits of interprofessional collaboration yet having limited interactions in practice.

Whilst these studies represent an exploration of some of the IPIs that pharmacists undertake with specific HCPs, it is evident from the literature that to date there has not been a synthesis of the broader requirements for pharmacists to engage in IPIs, the mechanism by which pharmacists undertake such IPIs and the barrier and facilitators to such IPIs.

## **2.5. Evidence underpinning interprofessional collaboration**

Interprofessional collaboration is a priority within the healthcare environment largely due to a hypothesis that it can improve patient care (World Health Organisation, 2010; Department of Health, 2013c). Whilst a range of individual studies have been conducted, to date there are no high quality generalisable studies which definitively evidence the specific benefits of interprofessional collaboration on improving patient outcomes. For example,

one method the DoH uses to assess NHS performance is the Outcomes Framework (Department of Health, 2013b; Department of Health, 2016). The framework is used to review measurable patient outcomes (such as patient survival for example in cancer, quality of life for people with dementia, time spent in hospital by people with long term conditions, etc.) in order to assess the success of services (Department of Health, 2013b; Department of Health, 2016). The framework however does not contain any specific measure of interprofessional teamwork and therefore it is difficult to isolate the specific impact this has on such outcomes.

In a recent Cochrane review, Reeves et al. (2017) assessed the impact of interprofessional collaborative interventions on patient outcomes. The review identified nine randomised controlled trials (RCT) that were suitable for inclusion, however all were considered to have low or very low certainty of evidence (see **Table 2.2a-c** for a summary of the studies). These studies were all conducted in high-income countries (Australia, Belgium, Sweden, UK and USA) in primary, secondary and tertiary care settings and had a follow-up of up to 12 months. Eight studies compared and evaluated an interprofessional care intervention with usual care and one study compared one type of interprofessional meeting with another (Wilson et al., 2004). Strasser et al. (2008) found that the functional status in stroke patients may be slightly improved by externally facilitated interprofessional activities and Cheater et al. (2005), Deneckere et al. (2013) and Schmidt et al. (1998) found that HCPs' adherence to recommended practices may be slightly improved with externally facilitated interprofessional activities or interprofessional meetings. In addition, interprofessional checklists (Calland et al., 2011), interprofessional rounds (Curley et al., 1998; Wild et al., 2004) or externally facilitated interprofessional activities (Strasser et al., 2008) were seen to slightly improve overall use of resources, reduce length of hospital stay, or reduce costs. Furthermore, Wilson et al. (2004) found that when compared to multidisciplinary audio conferencing, multidisciplinary video conferencing may reduce the average length of treatment and may reduce the number of multidisciplinary conferences needed per patient and the patient length of stay. All of these findings had a low certainty of evidence. Reeves concluded in the systematic review that it was unclear whether continuity of patient care or collaborative working were improved by externally facilitated interprofessional activities due to the very low-certainty for these outcomes. Of note none of the studies included reported on patient mortality, morbidity or complication rates.

**Table 2.2a.** Summary of the studies (n=9) included in the Cochrane review conducted by Reeves et al. (2017) which assessed the impact of interprofessional collaborative interventions on patient outcomes

Author	Study design, outcomes assessed and the impact of intervention on outcomes
<b>Black et al. (2013)</b>  Australia	<p><b>Method:</b> Cluster-randomised trial to test the effectiveness of an intervention involving non-GP staff in GP practices, on the quality of care for patients with diabetes or cardiovascular disease</p> <p><b>Participants:</b> General practitioners, nurses, practice managers, receptionists, and other administrative staff. 60 general practices were randomised to receive a 6-month teamwork intervention immediately (intervention, n = 637) or after 12 months (control, n = 548)</p> <p><b>Interventions:</b> To assist non-GP staff (e.g. nurses, administrative staff (practice managers, receptionists) to work as a team with GPs, the intervention included a number of activities including: the use of structured appointment systems, recall and reminders, planned care, the use of roles, responsibilities, and job descriptions, as well as communication and meetings</p> <p><b>Outcomes assessed:</b> Quality of care (12 month follow up)</p> <p><b>Impact of intervention on outcomes:</b> It is uncertain if externally facilitated interprofessional activities increases patient-assessed quality of care because the certainty of this evidence is very low. It is uncertain whether externally facilitated interprofessional activities improve collaborative working, team communication, and co-ordination because the certainty of this evidence is very low.</p>
<b>Calland et al. (2011)</b>  USA	<p><b>Method:</b> An RCT of an interprofessional collaborative intervention aimed to determine the effectiveness of procedural checklists for surgical teams during 47 laparoscopic cholecystectomies. General surgeons were randomly assigned to an intervention (i.e. the use of the checklist) or a control group</p> <p><b>Participants:</b> Ten general surgeon teams consisting of surgeons, anaesthetists and nurses. Twenty- three patients in the control group and 24 in the intervention group. Eighteen patients dropped out between the randomisation and the analysis</p> <p><b>Intervention:</b> An intraoperative procedural checklist including preoperative, intraoperative, and post- operative items</p> <p><b>Outcomes assessed:</b> Clinical process or efficiency outcomes: length of operation, discharge status, readmission rates and technical proficiency. Collaborative behavioural outcomes: team behaviours (e. g. team communication and co-ordination)</p> <p><b>Impact of intervention on outcomes:</b> Interprofessional checklists may slightly improve overall use of resources, length of hospital stay, or costs (low certainty). It is uncertain whether externally facilitated interprofessional activities improve collaborative working, team communication, and co-ordination because the certainty of this evidence is very low</p>
<b>Cheater et al. (2005)</b>  UK	<p><b>Method:</b> An RCT where 22 multidisciplinary teams from five acute care hospitals were randomised to an intervention group that participated in a facilitated programme on multidisciplinary audit or a control group</p> <p><b>Participants:</b> Nurses, doctors and other HCPs (e.g. pharmacist, social worker, physiotherapist), service support staff (e.g. ward clerk, care assistant), and managers. A range of specialties (e.g. surgery, medicine, and nephrology) were included. There were 11 teams with a total of 77 participants in the intervention group and 11 teams with a total of 64 participants in the control group</p> <p><b>Intervention:</b> Five facilitated meetings over 6 months with activities designed to support multidisciplinary teams to undertake an audit</p> <p><b>Outcomes assessed:</b> Collaborative audit activity</p> <p><b>Impact of intervention on outcomes:</b> The use of interprofessional activities with an external facilitator or interprofessional meetings may slightly improve adherence to recommended practices and prescription of drugs (low certainty). It is uncertain whether externally facilitated interprofessional activities improve collaborative working, team communication, and co-ordination because the certainty of this evidence is very low</p>

**Table 2.2b.** Summary of the studies (n=9) included in the Cochrane review conducted by Reeves et al. (2017) which assessed the impact of interprofessional collaborative interventions on patient outcomes

Author	Study design, outcomes assessed and the impact of intervention on outcomes
Curley et al. (1998) USA	<p><b>Method:</b> Randomised trial - Firm trial: patients and staff from inpatient medical wards at an acute care hospital were randomised to one of six medical wards. Three wards were allocated to the intervention group that implemented daily interdisciplinary work rounds, and three wards were allocated to the control group that continued traditional work rounds</p> <p><b>Participants:</b> Interns and residents in medicine, staff nurses, nursing supervisors, pharmacists, nutritionists, and social workers. There were 567 patients in the intervention group and 535 patients in the control group</p> <p><b>Intervention:</b> Daily interprofessional ward rounds</p> <p><b>Outcomes assessed:</b> Length of stay, total charges, orders for administration of aerosols</p> <p><b>Impact of intervention on outcomes:</b> Interprofessional rounds may slightly improve use of resources, length of hospital stay, or costs (low certainty)</p>
Deneckere et al. (2013) Belgium	<p><b>Method:</b> A post-test-only cluster-RCT of 30 teams caring for patients with COPD. 17 intervention teams and 13 control teams examined how the use of CPs improved team-work in an acute hospital setting</p> <p><b>Participants:</b> Doctors (i.e. orthopaedic surgeons or pneumologists), head nurses, nurses, and allied health professionals (i.e. physiotherapists and social workers). 581 participants: 346 in the intervention teams (N = 17) and 235 in the control teams (N = 13)</p> <p><b>Intervention:</b> The intervention involved the development and implementation of care pathways including 3 components: 1) feedback on team's performance before implementation; 2) receipt of evidence-based key-indicators for implementing care pathways in practice to review; 3) training in care pathway development. Control teams: usual care</p> <p><b>Outcomes assessed:</b> Conflict management, team climate for innovation, level of organised care, emotional exhaustion, level of competence, relational co-ordination</p> <p><b>Impact of intervention on outcomes:</b> The use of interprofessional activities with an external facilitator or interprofessional meetings may slightly improve adherence to recommended practices and prescription of drugs (low certainty). It is uncertain whether externally facilitated interprofessional activities improve collaborative working, team communication, and coordination because the certainty of this evidence is very low</p>
Schmidt et al. (1998) Sweden	<p><b>Method:</b> A RCT of 33 nursing homes, 15 experimental homes and 18 control homes, to examine the effects of monthly facilitated multidisciplinary rounds on the quality and quantity of psychotropic drug prescribing.</p> <p><b>Participants:</b> Doctors, pharmacists, selected nurses, and nursing assistants 1854 long-term residents: 626 in experimental homes and 1228 in control homes</p> <p><b>Intervention:</b> Pharmacist led team meetings once a month over a period of 12 months</p> <p><b>Outcomes assessed:</b> Proportion of patients receiving drugs, number of psychotropic drugs, use of non-recommended hypnotics, use of non-recommended anxiolytics, use of non-recommended antidepressant drugs</p> <p><b>Impact of intervention on outcomes:</b> The use of interprofessional activities with an external facilitator or interprofessional meetings may slightly improve adherence to recommended practices and prescription of drugs (low certainty)</p>

**Table 2.2c.** Summary of the studies (n=9) included in the Cochrane review conducted by Reeves et al. (2017) which assessed the impact of interprofessional collaborative interventions on patient outcomes

Author	Study design, outcomes assessed and the impact of intervention on outcomes
<b>Strasser et al. (2008)</b>	<p><b>Method:</b> A RCT, in which patients with a stroke were treated by 31 teams from 31 Veteran Affairs rehabilitation units before and after a multifaceted intervention, aimed at improving interprofessional collaboration</p> <p><b>Participants:</b> Medical doctors, nurses, occupational therapists, speech-language pathologists, physical therapists, and case managers or social workers. 464 participants: 227 in the intervention teams (N = 15) and 237 in the control teams (N = 16). Patients with a stroke were randomly assigned to each group</p> <p><b>Interventions:</b> Intervention teams: received the following multifaceted intervention: (i) an off-site workshop emphasising team dynamics, problem-solving, and the use of performance feedback data; (ii) action plans (specific team performance profiles with recommendations) for process improvement; (iii) telephone and video conference consultations to sustain improvement in collaboration. Control teams only received specific team performance profile information</p> <p><b>Outcomes assessed:</b> Functional improvement (as measured by the change in motor items of the FIM instrument), length of stay (LOS), rates of community discharge</p> <p><b>Impact of intervention on outcomes:</b> Externally facilitated interprofessional activities may slightly improve stroke patients' functional status and may slightly improve overall use of resources, length of hospital stay, or costs (low certainty). It is uncertain if externally facilitated interprofessional activities improves continuity of care because the certainty of this evidence is very low</p>
<b>Wild et al. (2004)</b>	<p><b>Method:</b> A RCT in which patients in inpatient telemetry ward in a community hospital were randomised to the intervention medical team, which conducted interdisciplinary rounds or to the control team, which provided standard care</p> <p><b>Participants:</b> Resident doctors, nurses, a case manager, pharmacist, dietician, and physical therapist. Eighty-four patients were enrolled: 42 in intervention and 42 in standard care</p> <p><b>Intervention:</b> Daily interprofessional rounds vs standard care</p> <p><b>Outcomes assessed:</b> Length of hospital stay</p> <p><b>Impact of intervention on outcomes:</b> Interprofessional rounds may slightly improve overall use of resources, length of hospital stay, or costs</p>
USA	
<b>Wilson et al. (2004)</b>	<p><b>Method:</b> A RCT comparing multidisciplinary audio conferencing and multidisciplinary video conferencing with a team that worked at two hospitals</p> <p><b>Participants:</b> Medical staff specialists, medical registrars, nurses, speech pathologist, occupational therapists, social worker, medical students. Fifty patients were randomly assigned to each group</p> <p><b>Interventions:</b> Interprofessional audio conferences and video conferences. At each conference session, the audio conferences were conducted before the video conferences, with the same interprofessional team</p> <p><b>Outcomes assessed:</b> Number of audio conferences held per patient, number of video conferences held, length of treatment</p> <p><b>Impact of intervention on outcomes:</b> No significant impacts identified</p>
Australia	

### 2.5.1. Evidence underpinning pharmacists' interprofessional collaboration

With the role of pharmacists expanding to take on more advanced clinical roles another Cochrane review, this time conducted by Nkansah et al. (2010), focused on health-related outcomes of newly implemented clinical pharmacy interventions (such as medication counselling and optimisation services). However, the authors found that improvements in clinical outcomes (i.e. improvements in blood pressure, cholesterol levels, asthma score, etc.) as a result of pharmacist interventions were not always statistically significant and importantly had little (if any) explicit focus on the collaborative aspect of interventions. As a follow-up to this study, Geurts et al. (2012) undertook a systematic review that primarily focused on medication review and reconciliation that were carried out through the cooperation of pharmacists and GPs. Some 83 studies were included in the review which varied in terms of the interprofessional interventions assessed as well as in the rigour of the studies. Although many of the included studies reported positive outcomes in terms of patient satisfaction and the resolution of drug-related problems, just three of these studies (Makowsky et al., 2009a; Roughead et al., 2009; Roughead et al., 2011) reported significant improvements in objective outcomes such as hospital (re)admissions, and these had a low certainty of evidence. One of these studies was conducted by Makowsky et al. (2009a) who undertook a multicentre, quasi-randomised, controlled clinical trial where 220 patients received 'team care' through proactive clinical pharmacist services (medication history, patient-care during participation in rounds, resolution of drug-related issues, and discharge counselling) versus 231 patients that received standard care. They found that team care patients experienced fewer readmissions at 3 months (36.2% vs. 45.5%) but not at 6 months.

Another study conducted by Roughead et al. (2009) reviewed the impact of collaborative GP-pharmacist home medication reviews on time until the next hospitalisation in patients with heart failure in Australia. Here an intervention group received a service that included a GP referral, a home visit by an accredited pharmacist to identify medication-related problems, a pharmacist report with follow-up undertaken by the GP. In total 273 patients received the collaborative home medication review service and 5444 did not. Unadjusted results showed a 37% reduction in rate of hospitalisation for heart failure at any time and adjusted results showed a 45% reduction among those who had received a home medicines review compared with the unexposed patients. Whilst there was a reduction in patient hospitalization, the collaborative interprofessional nature of the interventions was unclear as it seemed to represent a care schedule that had side-by-side input from two professions rather than them collaboratively working together for the patient.

Roughead later repeated this study but this time reviewed the impact of GP–pharmacist collaborative home medication reviews on bleeds that led to hospitalisation in patients on warfarin (Roughead et al., 2011). The intervention once again represented a loose definition of collaborative working with HCPs working side-by-side rather than collaboratively. Here the 816 patients who received the home service were compared with 16,320 who did not. They found a 79% reduction in risk of hospitalisation for bleeding between 2 and 6 months, however this was not sustained over time (adjusted results).

A number of further RCTs and reviews of RCTs have been conducted related to a range of ‘collaborative’ pharmacist interventions. However, many of these studies lack explicit descriptions of the collaborative nature of the interventions. The descriptions often excluded the frequency, mode (face-to-face, by phone, written, etc.) and content of interprofessional interactions making it unclear as to whether true interprofessional collaborative working (where HCPs worked together to achieve improved outcomes) had occurred or whether the collaboration was simply the transfer of information between professionals. Furthermore, it was often the case that the trials compared a service conducted by another HCPs (absent of a pharmacist) with a pharmacist intervention that was classed as ‘collaborative’ due to the requirement for the pharmacist to inform another HCPs of the action or decision they had taken. Nevertheless, a number of studies discussed below concluded that having pharmacists make interventions in collaboration with other HCPs could benefit a range patient outcomes.

One of these studies was an RCT conducted by Tsuyuki et al. (2016) which highlighted that a community pharmacists’ cardiovascular disease (CVD) intervention comprising of a Medication Therapy Management review from their pharmacist and CVD risk assessment and education (predominantly conducted solely by the pharmacists apart from when communicating with doctors following each patient contact – when first conducting pharmacist CVD intervention then at a three month review) significantly reduced the risk for CVD events (adjusted value of 21% reduction). A similar finding was reported in an earlier study by Tsuyuki et al. (2002) which assessed pharmacists’ role in the management of cholesterol. This study found that such were the improvements in patients’ cholesterol from the intervention (where it was stated that community pharmacists provided education, management and referral to GPs) the study was ended early to fully incorporate the intervention into practice, however once again the ‘collaborative’ nature of this involved a simple referral to GPs for further management.

A similar theme was observed across a number of systematic reviews of RCTs featuring pharmacist led interventions, including a review of pharmacist care in heart failure (HF) by Koshman et al. (2008), in management of dyslipidemia by Charrois et al. (2012) and blood pressure (BP) control by Santschi et al. (2014). It was concluded across these reviews that pharmacists' working collaboratively with other HCPs had a positive impact on patient outcomes, however it must be noted that these conclusions were often based on studies where there was no explicit comparison of interventions that were delivered solely by the pharmacist versus those that featured collaborative pharmacist-HCP interventions, where some comparison did occur there was no significant difference in outcomes, and the term 'collaboration' was rarely explicitly defined with many often seeing collaboration as information transfer between HCPs.

In one study Lalonde et al. (2011) aimed to explore the views of patients and doctors on pharmacists' engaging with doctors in the collaborative management of patients with dyslipidaemia. Whilst patients felt they received better follow-up care when pharmacist were involved in their care and doctors felt the collaborative management of patients' cholesterol was safe and effective, doctors were concerned that shifting some of the management activities to pharmacists may negatively impact their own relationship with the patient highlighting a potential issue with pharmacist-doctor interprofessional collaboration. A number of other studies also highlighted potential issues with pharmacist collaborative practice, one of which was an RCT conducted by Bryant et al. (2011) in New Zealand where authors compared a control group with patients receiving a clinical medication review conducted by community pharmacists in collaboration with GPs (pharmacists met with the patient's GP to discuss recommendations about possible medicine changes) which was followed-up 3-monthly. The authors found that although medication reviews helped improve medication appropriateness, patients' quality of life in the domains of emotional role and social functioning were seen to decrease significantly. Authors suggested that this may have been because participants possibly felt abandoned as 27 out of 44 pharmacists either withdrew or did not start the study citing time commitments required to conduct the intervention/study. Authors additionally concluded that the lack of community pharmacist participation suggested that community pharmacies may not be the appropriate environment in which to expand collaborative clinical medication reviews within primary care.

Furthermore, a number of other RCTs which explored joint pharmacist-doctor care found that these collaborative care methods had no improvement on a number of patient outcomes. For example in an RCT conducted by Holland et al. (2005) in the UK authors found that a pharmacist led home based medication review service (which included two home visits by a pharmacist within two weeks and eight weeks of discharge to educate patients and carers about their drugs, remove out of date drugs, inform general practitioners of drug reactions or interactions, and inform the local pharmacist if a compliance aid is needed) had no improvement on quality of life and in fact increased hospital admissions compared to the patients not receiving the service. Of note, the interprofessional nature of the service here simply involved information transfer to GPs regarding drug reactions and interactions rather than a truly collaborative service. In addition, another UK based RCT conducted by Richmond et al. (2010) recruited 760 patients across 24 GP practices to compare usual care with those receiving collaborative pharmaceutical care undertaken by community pharmacists who interviewed patients, developed and implemented pharmaceutical care plans together with the patient's GP, and thereafter undertook monthly medication reviews (both pharmacists and GPs attended training before the intervention). The study found that the intervention did not lead to any statistically significant change in the appropriateness of prescribing or health outcomes. Furthermore, in a similar RCT conducted by Sellors et al. (2003) in Canada comparing usual care with interventions where pharmacists conducted face-to-face medication reviews with the patients and then gave written recommendations to doctors to resolve any drug-related problems, found that although doctors accepted pharmacist recommendations, no significant improvements in patient outcomes or medication costs were observed.

With the literature evidencing the benefits of pharmacists collaborative practice having equivocal results, a low certainty of evidence and a lack of clarity related to the extent of the collaborative nature of each intervention, further work is needed to help evidence the value of interprofessional interactions involving pharmacists on patient outcomes.

## **2.6. Why is interprofessional collaboration not already the norm?**

Although the incorporation of interprofessional collaboration is being driven both national and international deficiencies in interprofessional practice have been evidenced (also see section 2.3) with the Department of Health (2013a) stating that this can result in time-delays, duplication of work, wasted resources, frustration and the delivery of poor patient care. Reasons for this lack of collaboration may therefore be explained by a number of barriers cited within the literature including: lack of access to HCPs due to the time

pressures HCPs face (Baxter and Brumfitt, 2008) and physical separation (McDonough and Doucette, 2001; Jenkins et al., 2016); historical cultural separation of HCPs (Hall, 2005; Kvarnström, 2008; Xyrichis and Lowton, 2008); lack of understanding or poor perception of professional roles and responsibilities (Hughes and McCann, 2003); negative perceptions and stereotypes (Jelphs et al., 2016); poor communication between HCPs (Long et al., 2003; Freeth et al., 2008); professional hierarchy and power relationships (Baker et al., 2011); specific characteristics of pharmacists that oppose collaboration (i.e lack of confidence; fear of new responsibility; paralysis in the face of ambiguity; need for approval; and risk aversion)(Rosenthal et al., 2010a).

Arguably, the most significant barrier to change is that the healthcare environment is still very much organised in a uniprofessional manner. It is an environment characterised by practitioners regulated by distinct governing bodies and by initial training and education of professionals that is unique to each different healthcare profession with limited opportunity for shared interprofessional learning. In a review of the literature conducted by Hall (2005) she summarised that the historic separation of HCPs (whether it be for practical, cultural or financial reasons) instils natural barriers to interprofessional working. She therefore stated that successful interprofessional practice required sensitivity to the varying historical, educational and social norms and values across HCPs.

The lack of understanding and poor perception of one another's professional roles has been identified as a key barrier to interprofessional working in practice, for example in a series of interviews with both GPs and community pharmacists' in Northern Ireland, Hughes and McCann (2003) identified that GPs' perception of pharmacists as 'shopkeepers' resulted in limited collaboration between the respective professionals. Furthermore, a questionnaire distributed to all HCPs employed by East London and the City Mental Health Trust conducted by Larkin and Callaghan (2005) found that whilst HCPs were clear of their own roles they felt other members of the team did not recognise or understand these roles resulting in sub-optimal interprofessional collaboration. The need for HCPs to understand other professions roles and responsibilities is vital for meaningful interactions with other HCPs in order to utilise expertise appropriately (Falck, 1977), however this is often lacking in practice, with Reese and Sontag (2001) suggesting this could be due to the limited common interprofessional experiences and education offered to healthcare students and professionals. In an ethnographic study conducted by Long et al. (2003) in the UK relating to the role of nurses within interprofessional rehabilitation teams, many nurses felt their contributions were not valued and that where the boundaries of their role blurred with other HCPs this led to professional tensions and rivalry. An example of the negative impact

of blurred roles was highlighted in a study by Schindel et al. (2017) (see section 2.4 for further details of this study) that found that when the role of the pharmacist overlapped with other HCPs roles this created conflict with certain professions believing they had autonomy over specific areas of practice, leading to poor interprofessional collaboration.

Long et al. (2003) also recognised that poor communication between HCPs could negatively impact interprofessional collaboration particularly when there were mismatches in communication styles and perceived variations in 'power differentials' which resulted in some HCPs believing they had less input or were less appreciated than other professions leading to reduced participation in interprofessional collaborative and interprofessional education sessions. Similarly, Nugus et al. (2010) conducted 63 interviews, 68 focus groups and 209 hours of observation of HCPs within acute and non-acute health services and showed that doctors were the dominating profession, assuming responsibility for patient management and coordinating roles within the healthcare team. Where this was not managed appropriately (i.e. if the doctors were competitive or dominating) other HCPs were less inclined to engage. Similar findings were also highlighted by Baker et al. (2011) who conducted a series of 25 interviews with a range of HCPs in Canada and identified that doctors perceived themselves as the 'leaders' and 'decision makers' in healthcare and pharmacists (and other HCPs) saw themselves as 'team members'.

A review published by Rosenthal et al. (2010a) discussed a number of characteristics commonly associated with pharmacists that they believed negatively impacted their interprofessional collaboration including: lack of confidence; fear of new responsibility; paralysis in the face of ambiguity; need for approval; and risk aversion. In addition, the authors indicated that when pharmacists were found to have reduced input into the interprofessional team (comparatively to other professions) this reinforced their own negative perception of the profession. This could be reversed once they were successfully integrated or embedded within an interprofessional team, with other HCPs within that team also quickly appreciating the value of the pharmacist. In addition, as discussed in section 2.4, pharmacists' have varying perceptions of their own roles and responsibilities (Elvey et al., 2013; Schindel et al., 2017), and although the Royal Pharmaceutical Society (2017b) believes that pharmacists should promote their roles to other HCPs in order to improve collaboration this may be made more difficult due to the lack of consistency in their interprofessional engagements that are dependent on their own individual role. Using 'critical incident technique' interviews on eighteen participants across nine different professions in Sweden, Kvarnström (2008) found that the HCP's specific role, responsibility and input to the team had a significant impact on their feelings towards interprofessional

collaboration, with those better immersed within the interprofessional team having a more positive perception towards current and future interprofessional engagement. These factors highlight the importance of understanding both one's own roles and responsibilities as a HCP and those of others.

One challenge organisations face is the limited understanding of the day-to-day compositions of interprofessional teams and issues surrounding interprofessional practice. This is made increasingly more difficult as Sir Robert Francis (the author of the Mid-Staffordshire review (Francis, 2013)) highlighted within his Freedom to Speak Up report that HCPs often are reluctant to raise concerns about professional (and interprofessional) practice (Francis, 2015). Two factors were given prominent focus: (i) fear of repercussions that speaking up would have for an individual and for their career and (ii) the futility of raising a concern because nothing would be done about it. It was therefore felt that by providing a more open platform where staff can readily and safely raise issues this may uncover specific local barriers to collaborative practice which when resolved could improve the delivery of patient care.

One way the NHS has tried to improve coordination across healthcare settings is by reorganising and merging healthcare providers (i.e. merging acute care, mental health and community health providers). Fulop et al. (2005) studied such mergers in the NHS and found some positive benefits in terms of staffing, training and influence on the local healthcare system. They also identified a number of negatives notably: smaller trusts perceiving a loss of informality and familiarity; smaller trusts viewing their larger counterparts as slow moving and unresponsive; and a difficulty in transferring good practice internally due to widespread distrust and staff still perceiving each other as part of the old constituent trusts. This highlights a key issue the NHS commonly faces when trying to implement widespread change i.e. resistance to change within the workforce. In terms of embedding interprofessional collaboration throughout the NHS organisation, the risk is that staff who are resistant to change will likely seek to retain uniprofessional habits. This was highlighted as an issue by Walshe (2003) in a review of the NHS's proposed development of foundation hospitals. A publication for the NHS Confederation by Edwards (2010) summarised the lessons learnt from past NHS major structural re-organisation and concluded that less dramatic changes should be considered before implementing major re-organisation which are perceived to be unpopular by employees. Indeed, in a study by Drinka et al. (1996) (using a questionnaire (n=516) to determine motivational styles of various HCPs within the interprofessional team over a 10 year period) it was shown that major re-organisation of teams can result in both professional and personal stress which

can lead HCPs to become more withdrawn and prone to retreat into their individual professional silos, where there is safety, clear limits, recognition of professional values and license to work autonomously.

### **2.7. How can interprofessional collaboration be improved?**

Improving interprofessional team working presents a complex challenge (see section 2.6). In order to achieve and maintain a shift towards embedded interprofessional practice from one that is uniprofessional, a change in culture within the healthcare system is required which will require a multifaceted approach to achieve (O'Leary et al., 2012). It is often suggested that the healthcare organisations should embed the teamworking practices from other enterprises and industries. One such area where healthcare organisation may translate lessons is from sports teams. The analogy is that like the healthcare environment, sports teams require both high levels of individual skill and the ability for team members to work together efficiently and effectively to achieve overall success (Cotterill, 2012). There are however a number of significant differences between the health and professional sports environment that make it challenging for healthcare teams to learn from sports teams. One of the key differences is that healthcare teams do not have the luxury of making errors (unlike conceding a goal for example) as this can result in patient harm (Francis, 2013; Kirkup, 2015). Furthermore, unlike within team sports where the aims are limited and consistent over time (for example to score more goals/points than the opposition), the desired outcomes for healthcare teams often change due to the complexities and needs of individual patients (Jelphs et al., 2016), resulting in the 'goalposts' shifting. Whilst achieving better teamworking is of value in both environments, with such variation in the numbers and expertise of the 'players' in healthcare, the complexities and aim of the game (providing individual safe patient care) as well as an absence of consistent coaching and license to fail limits the ability to directly translate the lessons from team sports to the healthcare environment (Reeves et al., 2010b).

One of the foremost efforts to translate learning from an industry to the healthcare environment has been from the aviation industry. In investigating aviation accidents, the National Aeronautics and Space Administration (NASA) identified that communication, leadership and decision making were accountable for the majority of accidents. A training programme known as Crew Resource Management (CRM) was subsequently developed which provided all aircraft crew with integrated training in communication, disclosure and teamwork behaviours (Helmreich et al., 1999) and has since been evidenced as successful in helping reduce accidents involving large aircrafts (Salas et al., 2008). A number of healthcare organisations have adopted the CRM approach in a number of specific care

settings such as emergency rooms, intensive care units and operating theatres where teams directly deal with a defined and specified problem under the leadership of a single individual, normally a doctor or surgeon (Risser et al., 1999; Sexton et al., 2000; Shojania et al., 2001). The approach has benefits where the healthcare environment has a structured approach (10% of healthcare provision) but limited value in the dynamic environments such as on wards and within primary care that comprise around 90% of healthcare provision (Green et al., 2001).

Another model which has more recently been implemented in surgical and intensive care units is the Formula 1 pit-stop model. A small number of hospitals have aimed to transfer the processes implemented by Formula 1 motor racing teams when individuals work in concert across a range of roles to effectively and efficiently conduct pit-stops to improve teamwork within emergency care settings (Naik, 2006; Catchpole et al., 2007; Merry et al., 2014). In a landmark UK study conducted by Catchpole et al. (2007) which measured the performance of a new handover protocol that was developed through discussions with both a Formula 1 racing team and aviation training captains (the CRM approach), clear benefits resulting from this approach were evidenced including a significant reduction in technical errors on handover, a reduction in the mean number of handover omissions and a reduction in the duration of handovers. A later study conducted by Merry et al. (2014) used the Formula 1 racing team approach to identify six actions for improving teamwork in cardiac surgery: (i) subspecialise and replace tribes with teams; (ii) sort out the leadership while flattening the gradients of authority; (iii) introduce explicit training in effective communication; (iv) use checklists, briefings, and debriefings and engage in the process; (v) promote a culture of respect alongside a commitment to excellence and a focus on patients; (vi) focus on the performance of the team, not on individuals. Once again, these studies utilised the teamworking approaches within highly structured care settings that require the resolution of defined specific problems and input of specific HCPs (within surgery, emergency care and intensive care) and did not explore the wider application of these methods.

Whilst the studies highlighted here recognise a number of benefits from the implementation of aviation and Formula 1 teamworking, these rigid approaches may have a limited applicability. Other more general areas of healthcare (which make up the majority of daily care delivery (Green et al., 2001)) require much more flexible and dynamic healthcare teams in order to combat the variability, complexity and uniqueness of patients' day-to-day health and social needs. HCPs therefore must be trained to integrate into various interprofessional teams when called upon, comfortably assuming the role which best meet

the patient's overall care needs. Furthermore, the teams used in both aviation and formula 1 require specific numbers of staff to proceed (i.e. a plane would not take off without a pilot), however within healthcare the staff are ethically bound to help each patient even if resources and staff are limited and therefore do not have the luxury to halt care if certain HCP team members are absent.

Physically incorporating HCPs into teams has been recognised to have some benefit to interprofessional engagement as it enables HCPs to build professional and social relationships which increases comfort and confidence within the interprofessional team, something identified by McDonough and Doucette (2001) in their model for improving relationships between pharmacists and doctors. A review conducted by O'Leary et al. (2012) into interprofessional working within hospitals (also discussed in section 2.2) also found that co-locating HCPs on interprofessional ward rounds could improve and promote interprofessional collaboration.

In a study conducted by that Xyrichis and Lowton (2008), the facilitators and barriers to interprofessional teamworking in primary care were summarised following a literature review (43 papers included). The benefits of co-locating HCPs alongside each other on interprofessional team working were identified and the authors found that the incorporation of interprofessional team meetings could help develop interprofessional relationships. Additional facilitators were recognised including: creating a climate of mutual respect and trust; having clear goals and objectives to the interprofessional collaboration; having a range of HCPs (and therefore specialties) involved in the care of patients; and assessing the success of collaborative working.

### **2.7.1. The role of Interprofessional education (IPE) in improving interprofessional collaboration**

Historically within the UK, HCPs have been educated in silos and subsequently work in silos regulated by distinct professional bodies. Both undergraduate and postgraduate education continues to be predominately a uniprofessional enterprise resulting in limited interaction across professional sectors. In a peer-reviewed practice review conducted by Rosenthal et al. (2010a) that looked at the barriers to pharmacy practice change in Canada, the authors suggested that if the field of pharmacy was to advance and have greater involvement in and engagement with the interprofessional team, the profession would need to transition from the rigid and historical educational models and embrace innovative and collaborative methods of education. One method that is currently being adopted in a variety of healthcare programmes is interprofessional education (IPE). Defined as occasions when “two or more

professionals learn with, from and about each other to improve collaboration and the quality of care” (pg. 6)(Barr, 2002b), IPE “is the process by which students from different professional programmes learn together during certain periods of their education with a view to enhancing collaboration and team work, and ultimately improving patient-centred care” (pg. 23) (World Health Organisation, 2013). IPE ultimately aims to improve interprofessional collaboration and patient care. Although the concept of IPE has been around since the 1960s (Barr, 2002a) it has only recently gained traction in undergraduate programmes.

With a range of benefits attributed to IPE that may directly address issues associated with unprofessional practice, IPE is being championed both nationally and internationally. So much so that the Lancet Commission stated in 2010 that IPE can be central to the reform in healthcare professionals’ education (Frenk et al., 2010). The World Health Organisation (2010) responded by issuing specific guidance on IPE, highlighting that it can be integral to improving interprofessional relationships and removing barriers between HCPs, leading to the delivery of safe, high quality patient care. Here, the WHO summarised that IPE could: (i) develop students’ communication skills; (ii) further students abilities to critically reflect; (iii) teach students to appreciate the challenges and benefits of working in teams; (iv) foster respect among HCPs; (v) eliminate harmful stereotypes; and (vi) evoke a patient-centred ethic in practice. These benefits align with the findings of a range of studies conducted (often based on HCP and service user perceptions – see section 2.7.1.1 for further details on IPE studies) which have cited benefits around: (i) the development of students’ interprofessional communication and relationships skills (Greiner and Knebel, 2003; Carpenter and Dickinson, 2014); (ii) reduction in their levels of professional bias, prejudice, stereotypes and rivalry (Freeth et al., 2008; Barr et al., 2017); (iii) recognition of their own and other HCPs’ roles and responsibilities (Freeth et al., 2008; Jacobsen et al., 2009); (iv) improved trust and respect across professions (Barr et al., 2017) and (v) a greater appreciation of safe and good practice (Barr et al., 2017).

With a number of benefits recognised by WHO they therefore concluded that IPE should be implemented in both undergraduate and postgraduate healthcare programmes worldwide (World Health Organisation, 2013). These international drivers prompted the Department of Health (2013a) to provide a statement on the need for greater incorporation of relevant and meaningful IPE across UK healthcare education.

As a consequence of these reports (particularly that by Frenk, 2010 and WHO 2010, a number of regulatory bodies including the General Pharmaceutical Council (GPhC) and the

General Medical Council (GMC) have made IPE a required element of the respective undergraduate degree programmes (General Medical Council, 2009; General Pharmaceutical Council, 2011). Essentially, policy makers believe that IPE can help equip the healthcare workforce with the ability to work effectively across health sectors and deal with issues that require the input of the interprofessional teams which will be necessary in order to effectively treat the growing numbers of patients with complex conditions and help patients cope with chronic illness (Barr et al., 2017).

#### **2.7.1.1. Evidence surrounding the benefits and development of IPE**

Whilst IPE is an activity that has become relatively commonplace within the pharmacy undergraduate curriculum it is clear that in order for students to achieve the beneficial outcomes attributed to IPE it must be implemented in a meaningful and relevant way and delivered effectively (see chapter 3 for further discussion). One challenge in achieving this has been directly measuring the benefits of IPE with much of the evidence surrounding its use of low quality.

In an update of a Cochrane systematic review of the literature relating to IPE, Reeves et al. (2010c) concluded that although some progress has been made in assessing the effectiveness of IPE (having increased from zero relevant studies in their first Cochrane review (Zwarenstein et al., 1999) to six studies ten years later) further work is needed to understand and evaluate the outcomes of IPE and ultimately demonstrate its benefit. Furthermore, of the six studies included (five from the USA one from the UK) just two reported positive outcomes of IPE (Morey et al., 2002; Young et al., 2005), two reported a mixed set of outcomes (positive and neutral effects) (Brown et al., 1999; Campbell et al., 2001), and two reported that IPE had no impact on either health care processes or patient health care or outcomes (Thompson et al., 2000a; Thompson et al., 2000b) (all studies have been summarised in **Table 2.3**). The absence of high quality evidence is likely due to a number of ethical considerations surrounding the use of RCTs in education (Reeves and Barr, 2016) and challenges in attributing improved outcomes related to communication and teamworking directly to the provision of IPE (Freeth et al., 2005). In its place, many evaluations of IPE focus on student and faculty perceptions of IPE which although valuable in determining beliefs about IPE they are poor at measuring student's progress as interprofessional practitioners (Thistlethwaite and Moran, 2010).

This led Reeves et al. (2016) to conduct a Best Evidence Medical Education (BEME) systematic review of studies which rigorously assessed (using high methodological quality) the beliefs and perceptions towards IPE. The review included 46 studies which represented

a significant increase since the previous review (n=21) (Hammick et al., 2007). Findings from the studies indicated that students responded well to IPE and had positive attitudes towards IPE. For example McFadyen et al. (2010) employed a longitudinal controlled trial design and gathered IPE attitudinal data with the use of two pre-validated surveys with over 500 students in either an intervention group (n=313) or control group (n=260) and found that students from a range of health and social care courses began their pre-registration education with strong positive views of the principles behind IPE. The review also showed that attitudes and perceptions of one another improved. For example Curran et al. (2007) used a mixed method pre- and poststudy quantitative and qualitative evaluation to find IPE was effective in enhancing understanding of the roles of other professions, fostering respect and positive attitudes toward interprofessional collaboration, developing collaborative competencies, and promoting organisational change. Similarly, the review evidenced that students improved their interprofessional knowledge and skills for practice. For example Carpenter et al. (2006) used a mixed methods approach of quantitative questionnaires and interviews to evaluate a postgraduate IPE programme designed to enable health and social care professionals to work together to deliver new community mental health programmes and found that students reported statistically significant increases in their knowledge and skills in interprofessional team working and use of psychosocial interventions.

**Table 2.3.** Summary of the studies (n=6) included in the Cochrane review conducted by Reeves et al. (2010c) which assessed the effectiveness of interprofessional education

Author	Study design and reported outcomes of IPE activities
Morey et al. (2002)	<b>Aim:</b> to improve collaborative behaviour of emergency department staff through the use of a controlled before and after study (CBA) <b>Activities:</b> lectures, discussion of videotaped segments of teamwork and clinical vignettes, teamwork exercises (8 hours) <b>Participants:</b> Doctors, nurses, technicians, clerks
USA	<b>Positive reported outcomes:</b> This showed a statistically significant improvement in quality of observed team behaviours between the experimental and control groups following training. The clinical error rate significantly decreased from 30.9% to 4.4% in the intervention group (p 1/4 0.039)
Young et al. (2005)	<b>Aim:</b> to improve competence of mental health practitioners through the use of a CBA <b>Activities:</b> presentations, small group discussions, role play and 3–4 day detailing visits, 16 hours of follow-up discussions <b>Participants:</b> Psychiatrists, mental health nurses, therapists, case managers
USA	<b>Positive reported outcomes:</b> This found that mental health practitioners in the intervention group, in comparison to those in the control group, reported significantly higher scores in relation to: teamwork; holistic approaches; education about care; rehabilitation methods and overall competency.
Brown et al. (1999)	<b>Aim:</b> to enhance practitioners' communication skills through the use of a RCT <b>Activities:</b> 4-hour interactive workshop, two hours of subsequent homework, and a four-hour follow-up workshop (didactic components, role playing, dialogue) <b>Participants:</b> Doctors, nurse practitioners, doctors' assistants, optometrists
USA	<b>Mixed reported outcomes:</b> This reported that while the communication skills training program did not improve patient satisfaction scores, clinicians' mean score in a survey they completed improved more in the control group than in the intervention group. This improvement, however, was not statistically significant.
Campbell et al. (2001)	<b>Aim:</b> to improve effectiveness of collective response of emergency department teams to intimate partner violence through the use of a RCT <b>Activities:</b> Two-day information and team planning intervention (didactic instruction, role playing, team planning, team work) <b>Participants:</b> Doctors, nurses, social workers, administrators, domestic violence advocates
USA	<b>Mixed reported outcomes:</b> This study found that the emergency departments which received the intervention recorded significantly higher levels on all components of the 'culture of the emergency department' system-change indicator (e.g., appropriate protocols, materials such as posters, brochures, medical record intervention checklists, referral information and training for staff) and higher levels of patient satisfaction than the emergency departments in the control group. There were no significant differences in the identification rates of domestic violence victims in the medical records of the experimental and control groups.
Thompson et al. (2000a)	<b>Aim:</b> to enhance recognition and management of depression in primary care practices through the use of a RCT <b>Activities:</b> Four-hour seminar delivered to the primary healthcare teams (videotapes, small group discussion of cases, role play) <b>Participants:</b> Doctors and nursing teams from the participating primary care practices
UK	<b>Reported no significant impact on outcomes:</b> This study reported no differences between the intervention and control groups in relation to the recognition of depressive symptoms. The outcome of depressed patients at six weeks or six months after the assessment did not significantly improve.
Thompson et al. (2000b)	<b>Aim:</b> to improve identification and management of domestic violence in primary care clinics through the use of a RCT <b>Activities:</b> Two half-day training sessions, three training sessions for opinion leaders, newsletter, four additional educational sessions, system support (e.g., posters in waiting areas, provider cue cards) <b>Participants:</b> Doctors, nurse practitioners, doctors' assistants, registered nurses, licensed practical nurses, medical assistants
USA	<b>Reported no significant impact on outcomes:</b> Although documented inquiries about domestic violence increased 3.9-fold at nine months in intervention clinics compared to controls and case finding also increased, both were non-significant. The recorded quality of domestic violence patient assistance did not change.

However, Reeves et al. (2016) did recognise that the self-report data used in these studies represented “a weak measure of knowledge and skills given an individual’s inability to assess such gains accurately” (pg. 16) and also felt these studies should be used with caution when assessing behavior change. The review also made a number of high level recommendations for the effective delivery and research of IPE, including the need for educators to ensure that IPE reflects current or future practice in order for sessions to be effective.

A small number of studies (most often involving the evaluation of students’ perceptions of single sessions through either questionnaires to interviews) have evaluated IPE sessions involving pharmacists (for example Jones et al. (2012), Henderson et al. (2013), Coulman et al. (2014), Rotz et al. (2015), Myers Virtue et al. (2017), Vogler et al. (2017)). However, the study numbers are limited and methodological quality varied (highlighted by the absence of these studies from the review by Reeves et al. (2016)). This makes it challenging to compare and contrast educational approaches and extrapolate findings further afield, leading Carpenter and Dickinson (2014) to conclude that greater levels of research are required within the field of pharmacy IPE to further develop and enhance its provision within the profession.

In 2017 the UK Centre for the Advancement of Interprofessional Education (CAIPE) released IPE guidelines to help educators develop meaningful and relevant IPE using a framework (Barr et al., 2017). Whilst this document helped summarise areas of the literature and provided discussion on implementing IPE, engaging service users, utilising resources, aligning learning and regulation and evaluating IPE, there was limited specificity in terms of the specific sessions that would be of value to developing practitioners. The recommendations for example did not elaborate on appropriate topics and learning outcomes that would be value to students, which HCPs to include in IPE (which ones and how many) and the time to introduce sessions. This represents a challenge for educators in knowing whether the sessions developed are relevant and reflective of day-to-day practice, something Barr et al. (2017) stressed was vital in ensuring sessions are in order for students to be actively engaged and see value in sessions (aligning with adult learning theory (Knowles, 1973), see chapter 3 for more detail). Given the current limited guidance relating to the development and delivery of effective, meaningful and relevant IPE, the paucity of literature detailing the IPE undertaken within pharmacy education and a lack of understanding about pharmacists’ interprofessional role(s) in practice, developing and embedding meaningful IPE is likely to remain a significant challenge for pharmacy educators.

## 2.8. Aims and objectives

Whilst interprofessional teamworking is being promulgated throughout the healthcare environment, little is known about the current state of pharmacists' interprofessional practice and it is consequently challenging to ascertain if the required provision of interprofessional education within the MPharm degree is effective or reflective of day-to-day practice. This study therefore aims to characterise the quantity and nature (i.e. topics, settings, student groups involved, learning objectives and methods of evaluation and assessment) of IPE activities that are taking place in UK MPharm programmes and to understand more about the interprofessional interactions that pharmacists currently undertake in their practice in Wales.

### 2.8.1. Objectives

In order to achieve the aims six objectives were set. Whilst objective 1 focussed on the landscape of IPE within UK schools of pharmacy, objectives 2-6 all focused specifically on pharmacists undertaking their practice within community pharmacies and hospitals within Wales:

1. To explore the current provision of IPE within UK MPharm programmes and to compare and contrast the IPE sessions pharmacy students are exposed to through the dissemination of an online questionnaire to IPE leads in all UK schools of pharmacy
2. To determine pharmacists' perceptions of the frequency of their interprofessional interactions with other HCPs and wider team members through the dissemination of a self-complete questionnaire to pharmacists practicing in Wales
3. To explore the perceived topics and mode (i.e. by telephone, face-to-face, by email, etc) of pharmacists' interprofessional interactions with other HCPs through the use of semi-structured interviews with pharmacists practicing in Wales
4. To explore the perceived facilitators and barriers to pharmacists' interprofessional practice through the use of semi-structured interviews with pharmacists practicing in Wales
5. To explore the perceived value pharmacists in Wales place on IPE and determine their opinions surrounding the design and implementation of undergraduate/postgraduate pharmacy related IPE through the use of semi-structured interviews with pharmacists practicing in Wales
6. Having addressed objectives 1 – 5, to make a series of recommendations that may help further pharmacists' interprofessional interactions and support the development of meaningful and relevant IPE.

**Chapter 3 - The landscape of interprofessional education within  
UK undergraduate pharmacy education**

### 3.1. Introduction

As the third largest healthcare profession in the UK, pharmacists have a responsibility to provide pharmaceutical care and deliver advice to patients, the public and other HCPs on the safe and effective use of medicines (General Pharmaceutical Council, 2018d). As discussed in chapter 2, NHS services are increasingly under pressure particularly as a result of increases in life expectancy, a growing population of older adults with complex health needs and a failure to recruit nurses and medics. Partly to reduce pressure on NHS services and partly to deliver more integrated patient-centred care, there has been a re-examining of the role of the pharmacist to better utilise their skill set as experts in medicines resulting in the expansion of the pharmacist roles in recent years (Royal Pharmaceutical Society and Royal College of General Practitioners, 2011; Bienkowska-Gibbs et al., 2015; Royal Pharmaceutical Society, 2015). Consistent with this has been a transition away from more traditional roles that have focussed on medicines supply as a core activity towards patient facing clinical activities related to optimising and managing patients' medicines (Department of Health, 2010; Primary Care Workforce Commission, 2015; Carter, 2016).

Given the changing focus of the pharmacist's role, the initial training and education of pharmacists must similarly evolve to ensure pharmacists are fit for contemporary practice at the point of registration. In the UK, the initial education and training of pharmacists is predominantly through a four-year Master of Pharmacy (MPharm) programme that is regulated by the General Pharmaceutical Council (GPhC) followed by a one-year pre-registration training programme; a small number of providers offer a 5-year programme with co-terminus graduation and professional registration. In order to register as a pharmacist, candidates must meet the pre-registration performance standards and pass the GPhC's registration assessment (General Pharmaceutical Council, 2018c). Together, these ensure that day one pharmacists meet the requirements of the GPhC to "protect, promote and maintain the health, safety and wellbeing of members of the public, and in particular those members of the public who use or need the services of pharmacy professionals or the services provided at a registered pharmacy" (pg. 5)(General Pharmaceutical Council, 2011).

At present there are 31 schools of pharmacy delivering the MPharm degree within the UK, 28 of which are fully accredited by the GPhC, with three schools provisionally accredited (i.e. the provider is working towards full accreditation). The number has grown in recent years (there was a total of 29 schools in the 2015/16 academic year when this study was conducted)(General Pharmaceutical Council, 2018a). The 'Future Pharmacists: standards for the initial education and training of pharmacists' document (General Pharmaceutical

Council, 2011) sets out the criteria against which providers are accredited for delivery of the MPharm programme and pre-registration training and also ensure that day one registrants are competent to practise. Whilst the standards do not include an indicative curriculum, an indicative syllabus is presented and standard 10 lists a series of 58 outcomes that need to be achieved in order to allow entry on to the GPhC register of pharmacists. The outcomes are assessed using the classification detailed in Miller's triangle (i.e. at the knows, knows how, shows how or does level, details of which can be found in **Table 3.1**) (Miller, 1990). The same outcomes apply to MPharm students and pre-registration candidates, but the level of assessment may differ. By the end of the pre-registration year students are expected to demonstrate that they meet the standards and outcomes at a show how or does level through successfully undertaking a range of practical tasks. Many of these outcomes cannot reasonably be addressed at the shows how or does level in the classroom environment during the MPharm degree. MPharm programmes are normally re-accredited every six years using methodology detailed in the GPhC's the 'Future Pharmacists: standards for the initial education and training of pharmacists', with earlier documentation such as the 'Accreditation of Master of Pharmacy Degrees' documentation (General Pharmaceutical Council, 2010) superseded.

**Table 3.1.** Description of the competency and assessment levels used by the GPhC for MPharm accreditation (GPhC, 2011), based on Miller's triangle (Miller, 1990)

<b>Competence and assessment hierarchy</b>	<b>Description of each competence and assessment level featured within the 'Future Pharmacists' document (GPhC, 2011) based on Miller's triangle (Miller, 1990)</b>
<b>Level 1 - Knows</b>	Knowledge that may be applied in the future to demonstrate competence. Assessments may include essays, oral examinations and multiple choice questions
<b>Level 2 - Knows how</b>	Context-based tests - knows how to use knowledge and skills. Assessments may include essays, oral examinations, multiple choice questions and laboratory books.
<b>Level 3 - Shows how</b>	A student or trainee is able to demonstrate that they can perform in a simulated environment or in real life. Assessments may include objective structured clinical examinations (OSCEs), simulated patient assessments, designing, conducting and reporting an experiment, dispensing tests and taking a patient history
<b>Level 4 - Does</b>	Acting independently and consistently in the complex situation of an everyday or familiar context. Evidence for this level is showing in this context that one is able to demonstrate the outcomes in a complex everyday situation repeatedly and reliably. Assessments may include OSCEs, taking a patient history and a trainee demonstrating things in the pre-registration performance standards repeatedly, accurately and safely. The trainee needs to be observed doing these things by their tutor and others.

Whilst the content of the curriculum is bespoke in each school of pharmacy, all MPharm programmes are required to integrate content (i.e. teaching across science and practice is

linked coherently) and the curriculum must be spiral (i.e. concepts are addressed in an increasingly complex manner until the right level of knowledge or competence is achieved) (Harden and Stamper, 1999; General Pharmaceutical Council, 2011). Schools must also define a clear assessment strategy that demonstrates how students will meet the programme learning outcomes, which must include “at least 3,000 hours of directed study of pharmaceutically-relevant subjects” (pg. 3) across the full-time four year programme, delivered through a number of different teaching methods (General Pharmaceutical Council, 2010).

The standards must be fit for contemporary practice and indeed, the GPhC have stated that education and training must “respond to the changing demands made of the profession and to allow for innovation at the same time as maintaining high quality practice” (pg. 5) (General Pharmaceutical Council, 2011). The regulator has considered emerging areas of practice and these are reflected in the ‘Future Pharmacists: standards for the initial education and training of pharmacists’ documentation. One such area of emerging practice has been interprofessional teamwork. As described in chapter 2, this reflects national and international drivers to better integrate HCPs in order to improve patient care through the effective sharing of skills and knowledge when HCPs work in collaboration (Department of Health, 2010; World Health Organisation, 2010). Embedding effective interprofessional working is not without its challenges, both structural and cultural (see chapter 2). However, with structural change seen to have little direct impact on improving healthcare outcomes alone (Fulop et al., 2005; Edwards, 2010) the need to affect a cultural change surrounding interprofessional working is greater than ever. Within healthcare, professions largely define their own identity, values and role in patient care, therefore this, along with their own particular approaches to problem-solving and professional priorities, results in HCPs commonly operating in professional silos (Hall, 2005). These silos are not confined to practice, they often emerge when students begin university, resulting in profound early development of interprofessional barriers such as unfamiliar vocabulary, misaligned values, approaches and priorities, and a lack of common understanding and respect for other HCPs’ roles, responsibilities and knowledge (Long et al., 2003; Hall, 2005; Jones, 2006; Kvarnström, 2008).

One method that has been proposed to begin to address these challenges, is the introduction of interprofessional education (IPE). This is defined as occasions when “two or more professionals learn with, from and about each other to improve collaboration and the quality of care” (pg. 6)(Barr, 2002b). IPE enables students from different healthcare programmes undertake sessions together and aims to enhance interprofessional

collaboration and teamwork, and ultimately improve patient-centred care (World Health Organisation, 2013). Although improvements in patient-centred care are central to the ethos of IPE there is little conclusive evidence which shows IPE directly benefits patients (Illingworth and Chelvanayagam, 2017). Indeed a systematic review into the impact of IPE on health outcomes conducted by Reeves et al. (2013) found no robust studies which directly evidence benefits to patients. Although many studies into IPE have a low certainty of evidence this does not mean IPE is without benefits. A number of studies have cited additional specific benefits (see chapter 2 for details) which are thought to help remove professional barriers and equip HCPs with the skills to collaborate and work more dynamically across sectors (World Health Organisation, 2010; Carpenter and Dickinson, 2014; Barr et al., 2017).

Such are the perceived benefits of IPE in fostering effective interprofessional collaboration in the provision of patient care that it is being championed globally. Indeed, a 2010 Lancet Commission, which comprised 20 international professional and academic leaders, highlighted the need for major reform in the training of healthcare professionals for the 21st century as they believed that healthcare education provision was (and most probably still is) fragmented and outdated, ultimately resulting in graduates who are ill-equipped for modern practice (Frenk et al., 2010). The commission suggested that integrating HCPs and removing professional silos through the use of IPE was a vital step towards aligning healthcare education and arming students with the advanced interprofessional collaboration skills needed to provide patient-centred care. This approach was subsequently presented to and championed by the World Health Organisation (2013) who recommended that IPE should be embedded into all undergraduate and postgraduate healthcare training programmes.

The GPhC is one professional regulator which has since moved to incorporate IPE into the initial training and education of all undergraduate pharmacists, making it a required element of the MPharm curriculum (General Pharmaceutical Council, 2011). As detailed in both the 'Future pharmacists: Standards for the initial education and training of pharmacists' (General Pharmaceutical Council, 2011), schools must provide students with environments and experiences which allow interaction with other HCP students. In addition, the GPhC have specified a number of outcomes related to IPE that must be achieved at the point of graduation (see **Table 3.2**). Pharmacy students must therefore gain practical experience of interprofessional collaboration and this must build year on year in a spiral fashion. This can be addressed through IPE based in a variety of settings including within practice, simulation settings and through traditional classroom learning.

To ensure IPE is implemented in the MPharm, schools must provide a detailed strategy of how the programme achieves the standards and outcomes related to IPE as part of the (re)accreditation of the programme (General Pharmaceutical Council, 2011). However, as schools are empowered to develop their own bespoke programmes against the GPhC standards, the GPhC is not prescriptive in terms of the type or extent of IPE that is expected. This allows schools some flexibility in designing IPE that fits into their current curriculum, helping schools to make compromises between the need for IPE, the outcomes required and the learning resources available in order to develop a curriculum which functions in a local context (O'Halloran et al., 2006).

A disadvantage of this approach is that it can be challenging for educators to ascertain how, when, where and with whom IPE should be conducted in order to provide the most valuable learning experiences for students that is contemporary to current practice. Furthermore, whilst standard 10 of the 'Future pharmacists' document (see **Table 3.2**) sets out a number of outcomes related to interprofessional knowledge and skills, many of these only require students to perform at the 'knows how' level with just one outcome (to *'provide accurate written or oral information appropriate to the needs of patients, the public or other healthcare professionals'*) requiring students to 'show' they can achieve this during the MPharm programme. The limited requirements for MPharm students to 'show' how they collaborate with other HCPs is perhaps a result of standards which were published 7 years ago and therefore the GPhC have stated the need to update these standards to better reflect the progression of interprofessional practice (General Pharmaceutical Council, 2017).

However, IPE has emerging importance in the MPharm degree and this is recognised in a number of accreditation and reaccreditation reports (in the public domain at the General Pharmaceutical Council (2018a)), which make comments and/or recommendations to some schools about their provision of IPE. In these reports the GPhC has provided tailored guidance to schools, for example some schools were advised to expand and develop their IPE portfolios; "(school A must) redouble its efforts to ensure that the obvious potential for interprofessional learning (education) be realised", "(school B must) articulate a strategy that includes meaningful engagement with a range of healthcare professionals". The GPhC also provided advice related to the types of IPE they would like to see in another school, stating that "(school C) should continue actively to explore IPE opportunities with other local higher education providers, especially in the areas of prescribing, pharmacology and therapeutics". In addition, in one school the GPhC noted that the ethos of a spiral curriculum related to IPE was deficient: "(school D should) continue its efforts to incorporate more

**Table 3.2.** Statements relating to the need for interprofessional collaboration within the MPharm degree from the General Pharmaceutical Council (2011) 'Future pharmacists: Standards for the initial education and training of pharmacists' document

Standard	Statement
<b>Standard 5:</b> Curriculum delivery and the student experience	The MPharm degree curriculum must include practical experience of working with patients, carers and other healthcare professionals. Practical experience should increase year on year. We are not suggesting that on-site placement visits are the only way to achieve this. Schools should articulate their strategy for meeting this criterion, which may include on-site placement visits, using patients, carers and other healthcare professionals in-class, and simulations.
<b>Standard 6:</b> Support and development for students and trainees	Students <i>and trainees</i> must work with a range of academic and professional role models. The range must include other healthcare professionals.
<b>Standard 10:</b> Outcomes	<p><b>Student knows how to:</b> Engage in multidisciplinary team working (<i>outcome 10.1.h</i>)</p> <p>Collaborate with patients, the public and other healthcare professionals to improve patient outcomes (<i>outcome 10.2.1.e</i>)</p> <p>Play an active role with public and professional groups to promote improved health outcomes (<i>outcome 10.2.1.f</i>)</p> <p>Work effectively within teams to ensure safe and effective systems are being followed (<i>outcome 10.2.3.k</i>)</p> <p><b>Student shows how to:</b> Provide accurate written or oral information appropriate to the needs of patients, the public or other healthcare professionals (<i>outcome 10.2.4.h</i>)</p>

interprofessional learning in the programme and certainly to extend it to years 2 and 4” resulting in IPE spanning across the four years. These recommendations demonstrate that the incorporation of IPE is at least partly driven by the regulator and perhaps suggests that further support and guidance for schools around the implementation of IPE could benefit its development in practice. By updating outcomes and standards required for MPharm students surrounding interprofessional collaboration this may in turn help further the advancement of IPE, with a study by Husband finding that pharmacy education developed substantially in response to the release of the 2011 GPhC accreditation standards evidencing that educational developments can be driven by the regulator (Husband et al., 2014).

With regulators and healthcare policy makers driving the incorporation of IPE in healthcare, education researchers have been keen to better understand and develop IPE delivery. Whilst research in this area varies greatly (see section 3.4 for further discussion), one area of particular focus surrounds the educational theory underpinning IPE, with Reeves and Hean (2013) arguing that understanding and application of theory is necessary, and whilst this has evolved and matured somewhat in recent years, Freeth et al. (2008) found in their influential review that the design of IPE is generally absent of explicit educational theory. One educational theory which is generally found, albeit not always explicitly, to underpin IPE is adult learning theory, with Reeves et al. (2016) finding (in their BEME systematic review of the effects of IPE) that sessions were better received when educators had designed sessions using the principles of adult learning. This learning theory, also sometimes known as andragogy, is the art and science of how adults learn (Knowles, 1973). This broad term encapsulates a range of approaches that centre on the notion that adults are self-directed and therefore need to see the value of learning something before they learn it.

However, given andragogy is a broad umbrella term for a variety of educational methods and theories, educators face a challenge in knowing the best approaches and strategies to adopt, particularly since there is significant variation in IPE delivery reported in the literature. The literature provides exemplars of various approaches to IPE including for example problem-based learning (see for example Reeves and Freeth (2002)); simulation-based learning (see for example Wakefield et al. (2003)); practice-based learning (see for example Reeves et al. (2002)); observation-based learning (see for example Guest et al. (2002)). Barr (2002b) also suggested that IPE can span (if it doesn't already do so) the full spectrum of learning opportunities / approaches including: case-based learning; exchange-

based learning; collaborative inquiry; appreciative inquiry; experiential learning; reflective learning; simulated learning; continuous quality improvement; etc. Educators are likely therefore to need to utilise a blend of these approaches with Barr et al. (2017) summarising that there is no single educational approach that addresses IPE and as long as sessions are interactive, reflective of practice, hold students interest, evolve over time and create opportunities for participants to develop a range of skills that can develop and reinforce interprofessional collaborative working then they will be of benefit.

With such varied educational strategies and no explicit guidance on the preferred nature and extent of IPE, the development of relevant and meaningful IPE is therefore challenging for educators. The need for sessions to be reflective of practice means educators must carefully consider the educational methods, learning outcomes and the most appropriate HCPs to incorporate into IPE sessions (Knowles, 1973; Parsell and Bligh, 1998; van Soeren et al., 2011; Barr et al., 2017) whilst being coconscious of resource constraints and competing priorities. This issue is further compounded by limited published literature of IPE delivery and development in the field of UK pharmacy education (Carpenter and Dickinson, 2014).

In order to add to this limited area of research and guide pharmacy educators this study aimed to identify the landscape of IPE sessions that take place within UK schools of pharmacy in the Master of Pharmacy programme. To address this, a questionnaire was sent to all UK schools of pharmacy to identify:

1. The number of IPE sessions employed in each Schools' MPharm programme
2. The range of HCPs taking part in each IPE session
3. The timing of each IPE session in the MPharm curriculum
4. The environment in which each IPE session took place (e.g. workshop room, simulation suites, etc.)
5. The educational theme of each IPE session
6. The learning outcomes set for each IPE session
7. The methods used to assess whether students have addressed the associated learning outcomes
8. The methods used to evaluate each IPE session.

## **3.2. Methods**

In order to identify the IPE undertaken within UK schools of pharmacy a questionnaire was developed. Total population sampling was used to invite all UK schools of pharmacy to participate.

### **3.2.1. Ethical approval**

Ethical approval was obtained from Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee prior to conducting this study (see Appendix B).

### **3.2.2. Sampling**

In order to help achieve the most representative and generalisable data, total population sampling was used (Teddlie and Yu, 2007) to invite an academic from all schools of pharmacy providing the undergraduate MPharm programme to participate in the study. At the time of the study, from March 2015 until March 2016, there were 29 schools of pharmacy delivering the MPharm programme (this has since increased to 31 schools). Of the 29 schools, 26 schools were fully accredited and three schools held provisional accreditation.

### **3.2.3. Recruitment**

An academic involved in IPE provision was identified in each school and was invited to participate in the study. These academics were identified through the research team's academic relationships with colleagues in other schools or through information on school websites.

Once an academic had been identified, they were contacted by telephone to explain the research and to determine if the individual was interested in and suitable for the study; if they were not interested or suitable they were asked to name a more appropriate individual in the school. Where telephone contact could not be made, an email was sent to inform potential participants of the project. If no reply was received, another member of staff was contacted.

Once an appropriate academic member of staff had been identified and provisionally recruited over the telephone or by email, further information was provided by email including an information letter (see Appendix C) as well as a web link to the online

questionnaire. A reminder email was sent to respondents if no response was received 4 weeks after agreeing to participate.

#### **3.2.4. Questionnaire design**

The questionnaire (see Appendix D) was designed in order to ascertain the IPE that was taking place as part of the MPharm programme within UK schools of pharmacy. The questionnaire design was informed by current literature in the field of IPE. Google Docs, a free Web-based application in which documents and spreadsheets can be created, was used for the questionnaire. This allowed for the questionnaire to be created, edited and completed using a secure online platform that made for ease of dissemination and data collection. The questionnaire predominantly utilised closed quantitative questions to gain valuable information at relative ease to the respondent (Kumar, 2014), but also included free-text format qualitative questions in order to gather further information.

The questionnaire was designed to be as short as possible, without compromising the key data needed, in order to increase the response rate achieved (Edwards et al., 2009). An approximate completion time of 15 minutes was ascertained following an initial pilot of the questionnaire (see section 3.2.5). An information page was provided at the start of the questionnaire explaining that all responses would be treated confidentially and that any publication of the findings would not name any individual or institution. The information page also provided instructions on how to complete the questionnaire.

The questionnaire comprised four distinct sections. Section A featured a series of multiple choice questions that were used to capture each school's overall provision of IPE. The questions determined: (i) the total number of undergraduate IPE sessions conducted by the school; (ii) the total number of student healthcare professions taking part across IPE sessions; (iii) the year that IPE was implemented in the school and (iv) if any new IPE sessions were being developed but had not yet been implemented by the school. In addition, respondents were asked to detail their specific role in the development of IPE in the school.

Section B focused on each individual IPE session that was taking place at the school across the 2014/15 academic year. A series of multiple choice and qualitative 'open' questions was provided for each individual IPE session in order to determine the specifics surrounding each session. These questions were used to capture: (i) the title of each session; (ii) how long the session had been run; (iii) the year of the MPharm programme in which the session took place; (iv) whether the session was compulsory for pharmacy students; (v) what other healthcare student professions were involved in the session; (vi) where the session was set;

(vii) the topic or theme of the session; (viii) the key learning outcomes for each session; (ix) whether these outcomes were measured (and how if applicable); (x) whether the session was evaluated (and how if applicable); (xi) whether the session would continue to run in the following academic year and if so whether any changes were to be made to the session. Respondents were also given the opportunity to make any other comments they deemed appropriate to each session. At the end of each page respondents were asked if they conducted 'any other IPE sessions', if they did they were transferred to a duplicate page which asked the same questions about each subsequent IPE session they conducted.

Section C comprised one open qualitative question to determine if any new sessions were to be initiated in the coming 2015/16 academic year and if so, what healthcare students were involved, the years each profession were in, the topic and location of the session, whether learning outcomes would be assessed and whether sessions would be evaluated.

The final section, section D, enabled respondents to make any further comments and provide their details if they would like to be contacted about the results of the study.

### **3.2.5. Piloting the questionnaire**

Once the initial questionnaire was completed, it was piloted by three academic staff within the Cardiff School of Pharmacy and Pharmaceutical Sciences (CSPPS). The staff members completed and critiqued the questionnaire for general flow and face validity where applicable (Babbie, 2015d), and also advised that an estimate completion time of 15 minutes was reasonable based on the IPE number conducted at CSPPS, however this may have been longer in schools with more sessions than CSPPS.

### **3.2.6. Data input**

Once a respondent had completed the online Google Docs questionnaire, data was exported and transferred into Microsoft Excel 2011 (version 14.7.2) for analysis.

### **3.2.7. Data analysis**

Following data transfer into Microsoft Excel 2011, closed question answers were quantitatively compiled to determine overall frequency statistics. Where qualitative responses were provided (for example when explaining learning outcomes of sessions) deductive thematic analysis was used to identify the relevant information within each text. This information was then coded and grouped appropriately, thus enabling quantification of these points (Braun and Clarke, 2006; Kumar, 2014). Responses in sections A-C of the questionnaire were analysed in this manner as each question purposefully aimed to deduce

certain information. In order to highlight the relevance of learning outcomes to pharmacy and other HCPs this data was additionally categorised into the seven outcome/standards which were present in all of the five largest healthcare professional regulators (GPhC, GMC – General Medical Council, GDC – General Dental Council, NMC – Nurse and Midwifery Council and HCPC – Health and care Professions Council) as identified by Steven et al. (2017). Due to the small number of additional free text comments provided in section D this data was presented however direct analysis was unwarranted.

### 3.3. Results

#### 3.3.1. Response rate

In total, 17 of the 29 schools of pharmacy took part in the online questionnaire providing an overall response rate of 58.6%. Whilst contact was made with a representative from all schools of pharmacy there were a number of reasons why some schools didn't respond including: the representative contacted was not the educator most involved in IPE provision and the appropriate educator did not respond; although some educators agreed to respond ultimately they did not complete the questionnaire (even after reminders were sent); one school felt the information was too sensitive to divulge. Responding schools were coded as A-Q for the remainder of this chapter in order to maintain anonymity. Of these, one school was provisionally accredited by the GPhC, with the remaining 16 having full accreditation. The majority of respondents completing the questionnaire on behalf of the school were the school's IPE Lead or the Director of Education.

One respondent only completed section A (general information related to IPE) and did not provide specific details about individual IPE sessions. This respondent indicated that they undertook a large number of sessions (n=20) (see **Table 3.2**) and therefore felt completing the full questionnaire would be too time consuming (see **Table 3.12**). Data analysis was therefore completed for 17/29 respondents in section A of the questionnaire, and 16/29 schools for the remaining sections of the questionnaire.

#### 3.3.2. General information on schools' IPE provision

Section A of the questionnaire was designed to capture an overview of the totality of IPE provision at each school: the key data from this section is presented in **Table 3.3**. The common number of IPE sessions undertaken across the 17 schools was difficult to establish as there was some disparity between the number of sessions reported in section A of the questionnaire and the in-depth description of those sessions captured in section B of the questionnaire. Therefore, two different median values for the number of sessions conducted across schools could be derived from the data; section A data highlighted a median of 6 and a range of 1 to 20 sessions; section B data highlighted a median of 5.5 and a range of 1 to 10 sessions. Ultimately the data highlighted that schools of pharmacy are likely to undertake an average of between 5 and 6 IPE sessions across the curriculum, however it must be noted that this data was non-parametric and therefore must be used with caution, particularly since there was such a large variation in the number of sessions undertaken across schools (1 to 20 sessions).

The IPE sessions that were delivered by schools varied considerably in terms of the student groups (defined as students from any course, inclusive of both HCP and non-healthcare courses) taking part: in school A, IPE was undertaken with students from two other student groups whilst for school J it was 12. A median of 6 student groups were engaged with pharmacy through IPE sessions, however once again the large range in number across schools must be taken into consideration. The earliest introduction of IPE within a school was in 1990, with all other schools implementing later than 2002 and the latest first implementation of IPE into the MPharm curriculum occurred in school P in 2014.

**Table 3.3.** A comparison of the number of IPE sessions, number of HCP student groups and the year IPE was introduced in the 17 participating schools of pharmacy

School of pharmacy (Anonymised)	Number IPE of sessions detailed (Section A)	Number of IPE sessions fully described (Section B)	Year IPE introduced	Total number of student groups undertaking IPE alongside pharmacy students
A	8	7	2011	2
B	3	4	2008	4
C	12	10	2013	5
D	4	4	1990	10
E	6	5	-	6
F	5	5	2010	5
G	6	6	2005	3
H	1	1	2008	4
I	4	7	2005	11
J	6	6	2002	12
K	3	3	-	7
L	6	6	2009	7
M	7	7	2012	5
N	4	4	2009	9
O	20	8	2008	6
P	5	5	2014	5
Q	20	-	-	10
<b>Total: 17</b>	<b>Median = 6 Range = 1-20</b>	<b>Median = 5.5 Range = 1-10</b>	<b>Median = 2008</b>	<b>Median = 6 Range = 2-12</b>

### 3.3.3. Description of IPE sessions conducted by participating schools

As one school did not provide details for each specific session, the analysis here is limited to 16 respondents. In total, 88 IPE sessions were described.

#### 3.3.3.1. HCPs with whom student pharmacists undertake IPE sessions

As highlighted in **Table 3.4**, 51 of 84 IPE sessions (data was missing for 4 of the 88 sessions) featured pharmacy students plus students from just one other discipline. Interestingly, some sessions did include high numbers of different student groups, with one school reporting the presence of eleven other student groups undertaking an IPE session alongside pharmacists. **Table 3.5** also shows that across the 84/88 sessions where student groups were identified, a total of 26 different student groups were included. Of these, medical students were the most common student group, and took part in nearly two-thirds of the reported IPE sessions (n=56 sessions). Other notable student HCPs present in over a quarter of all reported IPE sessions were nursing students (n=37) and physiotherapy students (n=22). Although the majority of the 26 student groups described could be categorised as undertaking professional healthcare programmes, a number of student groups were not. These included barristers, biology students, pharmacology students and sports & exercise science students (n=1 each). One school also conducted IPE sessions with students training to be pharmacy technicians.

**Table 3.4.** The number of student groups that took part in each individual IPE session (n=84)

Number of student healthcare groups taking part with student pharmacists in each IPE session	Number of sessions (n=84)
One other	51
Two others	8
Three others	3
Four others	5
Five others	3
Six others	4
Seven others	3
Eight others	2
Nine others	1
Ten others	3
Eleven others	1

**Table 3.5.** The identity of student groups that took part in each individual IPE session (n=84)

Student group (n=26)	Number of sessions in which student group took part (n=84)
Medicine	56
Nursing	37
Physiotherapy	22
Midwifery	17
Social Work	13
Dietetics	10
Occupational Therapists	
Biomedical Sciences	7
Speech + Language therapy	
Dentistry	6
Radiography	
Psychology	5
Operating Department Practitioner	4
Optometry	
Audiology	3
Mental Health	
Podiatry	
Paramedic	2
<i>Eight student groups including: Barrister, Biology, Healthcare Scientist, Non-medical prescribers, Pharmacology, Pharmacy Technicians, Sports &amp; Exercise Science and Youth worker</i>	1

Note: Those student groups in *italics* are non-healthcare related

### 3.3.3.2. The location and timing of IPE sessions

In total, IPE was compulsory for pharmacy students in 80 of the 88 sessions documented and all schools had at least one IPE session that was compulsory. For the eight sessions that were not compulsory, the proportion of the pharmacy student body that attended was described as 50% (n=2), 20% (n=2), 15% (n=2) and 10% (n=2). Of these four were IPE placements based in clinical settings, one was a simulation session, one was an IPE conference, one was a session with seven other HCPs and one was a workshop with nurses.

The MPharm year group taking part in each session was detailed for all 88 sessions and is shown in **Table 3.6**. This shows a relatively even spread across the four years of the MPharm programme, with the first (n=26), second (n=25) and final (n=31) year similar in the number of sessions offered; at n=17, the third year featured the lowest number of sessions across the participating schools.

**Table 3.6.** *The MPharm year group taking part in each individual IPE session (n=88)*

<b>MPharm student years taking part in each session</b>	<b>Number of sessions (n=88)</b>
Year 1 only	23
Year 2 only	20
Year 3 only	13
Year 4 only	26
Year 2,3,4	3
Year 1,2	1
Year 1,4	1
All four years	1

Although a number (n=8) of different settings for the delivery of IPE were described (see **Table 3.7**), two-thirds of reported sessions (n=57) were based in workshop style rooms and thirteen took place in simulation suites. In addition, some IPE took place whilst students were on placement (n=6) or in a clinical setting (n=5); other settings were relatively uncommon in comparison.

**Table 3.7.** *The setting of each individual IPE session (n=87)*

<b>Session setting</b>	<b>Number of sessions (n=87)</b>
Workshop room	54
Simulation suite	13
On placement	6
Clinical setting	5
Student choice	3
Lecture theatre and workshop room across the same session	
Online	1
Conference room	
Practical skills suite	

### **3.3.3.3. The topic or theme of each IPE session**

Respondents were asked to summarise the topic or theme of each IPE session. On a number of occasions respondents characterised the IPE session as featuring multiple topics/themes (120 topics/themes stated over 88 sessions) resulting in a total of 45 distinct topics identified (see **Table 3.8**). The two most popular topics for pharmacy students were prescribing and care planning, both of which occurred in 13/88 sessions. This was closely followed by sessions that involved the understanding of other HCP's roles and responsibilities (n=12), with many suggesting this also encapsulated an understanding of the pharmacist's own role within the team. Team building also featured as a theme in a number of sessions (n=9).

**Table 3.8.** The distinct topics / themes associated with each individual IPE session (n=88) (there can be more than one theme / topic per session)

The distinct topic /theme of each session (n=45)	Number of sessions (n=88)
Care planning	13
Prescribing	
HCP roles and responsibilities	12
Team building	9
Patient safety	7
Professionalism/ ethics	5
Drug/ family history	4
Substance abuse	
<u>Five topics/themes including:</u> Antibiotic choices; Basic life support; Consultation skills; Dispensing/clinical checking; Vital signs	3
<u>Six topics/themes including:</u> Patient engagement; Service user experience; Reducing errors; Mental health; eye conditions; foot care	2
<u>Twenty-six topics/themes including:</u> Asthma; Care home medications; Clinical governance issues; Clinical numeracy; Clinical skills; Consent; Dementia; Dysphagia & laryngectomy; Francis report outcomes; Gastrointestinal conditions; HCP role conference; Infection reduction; Information governance; Laboratory results; Medical clerking; Nutrition guidance; Pain cases; Pain management; Performance enhancing drugs; Pharmacokinetic workshop; Pharmacovigilance; Polypharmacy; Practitioner wellbeing; Team working OSCEs; UTIs; Warfarin counseling,	1

OSCEs = Objective structured clinical examination UTIs = Urinary tract infections

### 3.3.3.4. Learning outcomes associated with IPE sessions

In total 207 student learning outcomes were listed across 71 sessions (information on learning outcomes was not provided for 17 sessions) with a mean of approximately three learning outcomes per session (range 1 to 8). Learning outcomes are listed in **Table 3.9**, grouped by the seven key learning outcome themes which have been identified by Steven et al. (2017) to be consistent across the five largest healthcare professional regulators (GMC, GDC, GPhC, NMC and HCPC). The mapping shows that nearly half (n=95) of all learning outcomes set by educators were focused on 'teamworking'. These outcomes could be divided predominately into 'understanding/appreciating HCP roles' (n=35), 'understanding/displaying good team working' (n=30) and 'understanding/displaying good communication with HCPs' (n=29). The second largest outcome grouping was developing 'skills for practice' (n=39), which included 'understanding/displaying good communication with patients' (n=13) and 'safe prescribing' (n=4), amongst others. The least used outcome theme was 'ethical approach to practice' with only six of the 207 outcomes identified focused on this outcome theme.

**Table 3.9.** The student learning outcomes for IPE session mapped to the seven key learning outcome themes identified by Steven et al. (2017) to be consistent across the five largest healthcare professional regulators (GMC, GDC, GPhC, NMC and HCPC)

<b>Theme</b>	<b>Learning outcome</b> (207 learning outcomes across 71 sessions)	<b>Number of sessions</b>
<b>Teamworking</b> Total = 95	<u>Understanding/appreciating:</u> HCP roles	35
	<u>Understanding/displaying:</u> Good team working	30
	<u>Understanding/displaying:</u> Good communication with HCPs	29
	<u>Understanding:</u> Professional referral	1
<b>Skills for practice</b> Total = 39	<u>Understanding/displaying:</u> Good communication with patients	13
	<u>Demonstrating:</u> Safe prescribing	4
	<u>Demonstrating:</u> Basic lifesaving skills; Apply learning to calculations	3
	<u>Demonstrating:</u> Vital signs assessment skills	2
	<u>Understanding:</u> Drug issues; Medications management; Problem-based learning	2
	<u>Demonstrating:</u> Clinical decision making; Drug history taking; Increased hospital familiarity; Over the counter patient management; Physiotherapy assessment; Practical injection skills; Providing medical information; Reading drug charts	1
	<u>Integrating:</u> HCPs to provide holistic patient care	15
<b>Patient-centered approach</b> Total = 21	<u>Understanding:</u> Human factors in care; The patient journey	2
	<u>Demonstrating:</u> Near miss reporting	1
	<u>Understanding:</u> Patient compliance	1
	<u>Understanding:</u> Mental health issues	3
<b>Knowledge for practice</b> Total = 16	<u>Understanding:</u> Polypharmacy issues	2
	<u>Understanding:</u> COPD/asthma; Dementia care; Diabetes treatment; Drugs in sport foot problems; Gastrointestinal symptoms; Intricacies of an eye clinic; Laboratory tests; pain; Pharmacovigilance; Pregnancy	1
	<u>Understanding/demonstrating:</u> Patient safety exercises	5
	<u>Demonstrating:</u> Professionalism	4
	<u>Understanding:</u> Cultural diversity	3
<b>Professionalism</b> Total = 16	<u>Demonstrating:</u> Prioritisation	2
	<u>Understanding:</u> Professional negligence	2
	<u>Evaluating:</u> Own learning and recognise improvements	12
	<u>Finding:</u> Information services	1
	<u>Understanding:</u> Guidance	1
<b>Continuing professional development</b> Total = 14	<u>Understanding:</u> Ethical dilemmas through debate	4
	<u>Understanding:</u> Confidentiality consent	1
	<u>Understanding:</u> Ethical dilemmas through debate	4
<b>Ethical approach to practice</b> Total = 6	<u>Understanding:</u> Confidentiality consent	1

### 3.3.3.5. Assessment of student learning outcomes

Students were assessed against the learning outcomes in exactly half of the sessions reported (42 out of the 84 sessions – data missing for four sessions) (see **Table 3.10**). Production of a reflective statement or Continuing Professional Development (CPD) entry were the most common forms of assessment (n=15). This was followed by OSCEs (objective structured clinical examinations) and summative exams which were each used in eight sessions as methods of assessing learning outcomes.

**Table 3.10.** Methods of measuring student outcomes in each individual IPE session (n=42/84)

Method used to assess learning outcomes	Number of sessions assessed in this way (n=42/84)
Reflective statement/CPD <sup>^</sup>	15
OSCE (summative, formative and indirect)	8
Summative exam	
Formative assessment/feedback	6
Coursework/ write up/ summative report	3
Group assignment/ presentation	2
<u>Six methods including:</u> Critical review; Engagement marking; Formative poster presentation; Judged by expert panel; Posting learning points online; RCA (not defined) in assessment	1

<sup>^</sup>Two were specifically defined as summative CPD entries, others did not define if summative or formative

### 3.3.3.6. Evaluation of IPE sessions

Sessions were evaluated in 57 of the 83 sessions for which an answer was provided (in five sessions it was not reported whether evaluation was/was not conducted – missing data)(see **Table 3.11**), with 30 of these evaluations adopting the Readiness for Interprofessional Learning Scale (RIPLS) (Parsell and Bligh, 1999) or a similar student perception survey. Some universities used mixed methods in order to evaluate the sessions, for example a total of nine sessions were evaluated using both RIPLS and student interviews. Of the 57 sessions described as evaluated, three did not provide details on the evaluation method that was used.

**Table 3.11.** *Methods of evaluating each individual IPE session (n=57/83)*

<b>Method of evaluating sessions</b>	<b>Number of sessions evaluated (n=57/83)</b>
Student perception analysis (Adapted RIPLS)	12
RIPLS only	9
RIPLS and Student interviews combined	
Evaluation completed by central IPE team	6
Online evaluation tool	
Student reflections	5
Intended learning outcomes questionnaire	4
Facilitator feedback	2
Healthcare Team Challenge questionnaire	1
Informal qualitative debrief	
<i>Missing</i>	3

### 3.3.4. New IPE sessions to be implemented in the next academic year

Respondents were asked to indicate any new sessions that were starting in the next academic year (2015/16). Eleven schools indicated that they were initiating new sessions (see **Table 3.12**) and a total of 25 new sessions were described.

Similar to existing sessions, the majority (n=13) stated that new sessions would feature medical students. The MPharm year group participating in the sessions was spread fairly evenly across all four years: Year 1 (n=3), Year 2 (n=4), Year 3 (n=5), Year 4 (n=6). A range of 23 different topics / themes associated with the new sessions were described across the 25 sessions.

The number of sessions each of these schools undertook in 2014/15 was added to **Table 3.12** to highlight the impact the addition of these sessions will have on each school's overall IPE provision. School H, which was undertaking just one session in 2014/15, showed a significant expansion of their IPE portfolio with the introduction of four new sessions, resulting in this school providing close to the average of 5.5 (SD = 2) sessions per school. School C was also seeking to add four sessions, resulting in fourteen sessions overall.

**Table 3.12.** Details of additional IPE sessions planning to be introduced in the following academic year (2015/16)

School	MPharm year group	HCP	Topic (Setting if stated)	2014/15 IPE no.	2015/16 IPE no.
A	Year 4	Medicine - Year 3	Palliative care; syringe drivers, prescribing, oral care (Workshop room)	7	8
C	Year 2	Nursing - Year 2	Medicines administration and ethical issues	10	14
	Year 3	Medicine	Primary care placement (Primary care)		
	Year 3	Nursing - Year 3	End of life care		
	Year 4	Dentistry - Year 4	Interprofessional work between the professions		
F	-	Medicine	Legislation	5	7
	-	Medicine	OSCEs		
H	Year 1	Medicine - Year 1	Professionalism, basic health monitoring, public health	1	5
	Year 2	Medicine - Year 3	Lung disease		
	Year 3	Physiotherapists - Year 3	Cardiovascular challenge: Social work symposium with patients and carers (lecture theatre)		
	Year 4	Medicine and Midwifery	Pregnant, paediatric and aging patients		
I	-	-	Patient simulation (Simulation suite)	7	9
	-	-	Primary care placement (Primary care)		
J	Year 4	Medicine - Year 4	Ward simulation	6	11
	Year 2	Medicine - Year 2	Renal team based learning		
	-	Medicine - Year 5	Prescribing on wards		
	Year 3	Medicine - Year 2	Diabetes experience challenge		
	Year 4	Medicine - Year 4	Polypharmacy		
K	-	-	IPE with GP surgeries	3	6
	Years 1 - 4	-	'Pharmacist as a clinician' helping students with their professional identities		
	-	-	Working with patients with learning disabilities and their carers		
L	-	-	Joint placement sessions (Placement)	6	7
M	Year 1	Speech and Language Therapy, Optometry, Dentistry, Social Work, Audiology and Medicine	Mapping the professions on a patient journey (Large workshop space/ hall)	7	8
N	Year 3	Nursing - Year 2	NICE Evidence Search Student Champion scheme	4	5
O	-	Medicine	Falls and polypharmacy in the elderly	8	9

### 3.3.5. Qualitative comments

Respondents were given the opportunity in section D to provide any additional information they deemed appropriate and which had not been covered elsewhere within the questionnaire; just four respondents left comments which are reproduced in **Table 3.13**.

**Table 3.13.** Additional qualitative comments made by respondents (n=4)

School	Comment
<b>School C</b>	This respondent felt that <i>“timetabling has been a constant challenge”</i> when aiming to set up and deliver IPE and that within their University they <i>“have a Steering Group for IPE in the College”</i> .
<b>School H</b>	Stated they were <i>“moving to a new curriculum in the coming academic year therefore many of the sessions are to be piloted and introduced then”</i> . This is evident as this particular school only conducted one IPE session however were set to introduce four more in the following year, which can be observed in section 3.3.4.
<b>School M</b>	Felt that <i>“with the mandatory requirement to do IPE in early years when other HCPs do not have the same requirements”</i> the IPE sessions are <i>“very hard to establish”</i> . They also posed the question; <i>“are negative IPE experiences published and what is the long-term effect of this?”</i>
<b>School Q</b>	Stated <i>“we have more than 20 activities across the four years and to deconstruct each one into the form that you request is not practical. I am very keen to support your research but this must be in a way that is manageable”</i> .

### 3.4. Discussion

Despite the required nature of IPE within the UK MPharm programme, there remains a paucity of literature examining the nature and effectiveness of IPE in undergraduate pharmacy education. In this study, a questionnaire was developed and disseminated to UK schools of pharmacy to better understand the landscape of IPE in MPharm programmes. Over half (n=17/29) of schools delivering the MPharm programme at the time of the study responded, providing detailed descriptions of a total of 88 IPE sessions. This data highlighted that whilst an average of approximately 5 sessions were delivered in each MPharm programme there was a large range across schools, with one school delivering a single session and two schools stating they delivered twenty.

O'Halloran et al. (2006) described how "curriculum design is always a compromise between the educational idea, the teaching and learning resources available and what will work in a local context" (pg. 26). This highlights the challenge faced by pharmacy educators in designing and implementing meaningful and contemporary IPE (Carpenter and Dickinson, 2014), particularly as there is little practical guidance related to IPE design and delivery for the MPharm programme (General Pharmaceutical Council, 2011). Pharmacy educators must therefore create IPE sessions they believe to be fit for purpose against a context of local restraints not least the local availability of students of other healthcare disciplines with which to engage (Neocleous, 2014). This has likely resulted in the significant variation in the nature and extent of IPE provision across UK pharmacy schools, something that was immediately evident when comparing the number of IPE sessions taking place across schools. This disparity in IPE provision prompts the question as to whether there is a variation in the perceived value of IPE and/or major differences in the challenges faced by schools in implementing IPE particularly related to the time and resources needed to initiate and sustain sessions.

At present, the GPhC does not publish minimum expectations for the number of IPE sessions in the MPharm programme. This is likely due to a lack of consensus on the minimum exposure to IPE that is required to enable student practitioners to develop interprofessional competencies. With a number of benefits to IPE cited throughout the literature (see section 3.1) many proponents of IPE do suggest that more is better, with students gaining incremental benefits from each session attended (Lapkin et al., 2012; Carpenter and Dickinson, 2014; Harden, 2015). Despite the apparent benefit of higher numbers of sessions, this must be balanced against the need to ensure that IPE sessions are meaningful and not just bolted onto the curriculum to fulfill a perceived quota (Barr et al., 2017).

Furthermore, as there is limited high quality evidence surrounding IPE (see chapter 2.7.1 and Zwarenstein et al. 1999, Reeves et al. 2010c) this explains why the World Health Organisation (2013) made the recommendation of IPE implementation 'conditional'. This recommendation for implementation by WHO was based on their belief that there is "sufficient evidence to indicate that IPE enables effective collaborative practice which in turn optimises health-services, strengthens health systems and improves health outcomes" (pg. 18) (World Health Organisation, 2010). The limited evidence related to changes in behaviour, organisational practice and benefits to patients/clients (Hammick et al., 2007; Reeves et al., 2016) may have therefore contributed to the variation in session numbers across universities as educators may be unable to directly pinpoint the beneficial outcomes for students.

The desire to expose students to multiple IPE sessions was evident in the data, with 80 of the 88 sessions described as compulsory for pharmacy students to attend. For five of the eight sessions that were described as being non-compulsory, the settings in which they occurred were either during placements or as part of a simulation activity. Historically these types of activities are challenging to scale up due to limited capacity in physically accommodating large student numbers. This is an issue that has been commonly reported in the literature resulting in the need for either large environments or multiple sessions (Buring et al., 2009; van Soeren et al., 2011; Neocleous, 2014). Furthermore, two of these non-compulsory sessions included seven or more HCPs. Aligning timetables across all of the courses or programmes for large numbers of students is likely to have impacted on the ability for all students to attend. This is seen to be another significant barrier in the literature (Levett-Jones et al., 2012; Lapkin et al., 2013; Carpenter and Dickinson, 2014). These logistical challenges can often deter schools from conducting sessions, however whether it be due to the rising status of IPE or its requirement within the MPharm curriculum (General Pharmaceutical Council, 2011) they are challenges which have as far as the data is able to corroborate, for the most part, been overcome in the participating schools. In addition to increasing students' involvement by making IPE compulsory it is thought that this can also enhance the status of a session and thus increase students' engagement and commitment (Reeves et al., 2012).

In this study, the majority of IPE sessions (n=54) were described as being set in a workshop (classroom) environment, an area which allows for students to engage in discussion and work together to address learning outcomes. This workshop setting has been shown to increase students' participation in their learning (Taylor et al., 2012) particularly where

students work in small groups (Parsell and Bligh, 1998). This format of learning has been shown to make IPE more effective (Barr et al., 2017) probably because it is more closely aligned to the multidisciplinary team model prevalent in the NHS. Some IPE sessions were described as taking place in a clinical environment either when students were on placement (n=6) or in some other clinical settings (n=5). Barr (2000) believes that practice-based IPE is more likely to improve the quality of services and benefit users over university-based IPE. This draws from the concept of providing authentic learning, an educational theory that typically focuses on real-world, complex problems and their solutions. As suggested by adult learning theory, students need to see the value of learning, therefore by placing students in an authentic practice-based environment this can help them more readily recognise relevance and therefore engage in sessions (Jonassen, 1999). In addition to providing real-world relevance, this type of learning is by nature highly collaborative with tasks requiring students to utilise multiple sources and perspectives to solve complex real-world problems that cannot be solved individually, therefore ensuring students actively collaborate with other healthcare colleagues (Lombardi, 2007). These authentic sessions can also make learning more appealing for students (Carpenter and Dickinson, 2014) and can enable them to directly observe how each HCP role can impact overall patient care (Jacobsen et al., 2009).

The combination of integrating practice-based IPE within a university degree was first pioneered at Linköping University, Sweden, which featured students from a range of professions working together to operate a hospital ward with authentic patients (Hammar, 2000; Wilhelmsson et al., 2009). This long established and novel programme represented a successful method of delivering IPE and has subsequently been replicated elsewhere, with many universities expressing how this method facilitated students to develop the knowledge, skills and attitudes required for the delivery of interprofessional, patient-centred care (Reeves and Freeth, 2002; Hylin et al., 2007; Hylin, 2010; Brewer and Stewart-Wynne, 2013).

Whilst some practice-based IPE was identified to take place in some MPharm programmes, it represented only a small proportion of the IPE sessions described. This is possibly as a consequence of limited capacity, constrained resources within the clinical settings or an anxiety by organisations to engage student practitioners in the delivery of healthcare given the associated risks (Issenberg and Scalese, 2008). Another key factor pharmacy schools must take into account is the potential high financial cost of undertaking practice-based IPE. Whilst this is a consideration for all courses, as the UK MPharm degree is defined as a

'science degree' it does not attract the additional funding that 'clinical degrees' such as medicine and nursing do. This constrains the ability from to fund placements and may therefore further explain why schools sought to undertake IPE outside of practice-based sessions.

One setting seen as an appropriate alternative to providing authentic learning outside of practice-based sessions is the use of simulation-based learning (Robertson and Bandali, 2008; Barr et al., 2017). Here simulation and role-playing is used to immerse students in the complexities of authentic decision making, helping them develop communication, collaboration, and leadership skills (Lombardi, 2007). These clinically-orientated simulated environments aim to closely mimic the healthcare practice setting and provide a safe, less pressured environment for students to develop interprofessional and technical skills (Reeves and van Schaik, 2012). However, in order for these IPE sessions to help build professional identities, improve self-awareness and afford students the opportunity to practice newly acquired knowledge, sessions must be authentic and maintain realism, therefore students should be assigned their relevant professional roles and given tasks that are likely to occur in practice (Issenberg et al., 2005; van Soeren et al., 2011). Providing simulation-based learning also has other challenges, not least the difficulty in scaling simulation to accommodate significant numbers of students (Barr et al., 2017). Furthermore, whilst these sessions may provide a less expensive alternative to practice-based sessions they still require significant investments in resources which may not be available to schools and could once again explain why just 13/87 sessions utilised this environment, with considerably more favouring workshop rooms (Barr et al., 2017). As such a review of the use of simulation in IPE conducted by Reeves and van Schaik (2012) concluded that further research is needed to understand the interprofessional benefits students may gain from sessions (in addition to conducting simulation unprofessionally) in order to justify to costs, and therefore recommended that simulation should be part of a portfolio of IPE activities rather than the sole methodology.

All of the environments discussed so far enable students to take part in interactive face-to-face sessions (Abu-Rish et al., 2012). However advances in technology are providing alternative platforms for IPE which can overcome logistical issues such as scalability to accommodate large numbers of students, timetabling and resource challenges (Lapkin et al., 2012), and can help broaden the adoption of IPE (Riesen et al., 2012) whilst maintaining the ability for students to achieve interprofessional outcomes such as understanding, respecting and valuing professional roles and boundaries (Clouder et al., 2011). In this

study however, the use of digital technologies to enable IPE was extremely limited with just one out of 87 sessions utilising an online environment to deliver IPE highlighting that pharmacy educators either do not have the technological capacity to conduct these sessions, or do not believe these sessions are as valuable, something which may likely be the case as these sessions lose the face-to-face contact which is a key facilitator in building relationships and developing collaborative skills (Carpenter and Dickinson, 2014). This therefore led Barr et al. (2017) to state new IPE techniques should not replace traditional methods, but should be blended with face-to-face learning, with Reeves and van Schaik (2012) believing these varying techniques can complement one another.

There has been much debate within the literature on the optimal time to introduce IPE. Some authors, like Carpenter and Dickinson (2014), recognise the argument that until individuals have established their own professional identity or have sufficient experience to share with other HCPs the benefits of IPE are limited and therefore suggest it should commence post-qualification (i.e. during post-graduate study). However, this belief clearly differs from most, with research by Rodger and Hoffman (2010) which surveyed 396 healthcare educators across 41 countries worldwide finding that 86% of IPE was conducted at undergraduate level, and a study by Barr et al. (2014) finding that two-thirds of UK universities delivering healthcare courses provided undergraduate IPE. With research into undergraduate IPE clearly growing from a time when 70% of that conducted was focused on postgraduate IPE (Freeth et al., 2002), the belief that IPE should be incorporated as early as possible is also gaining legitimate traction (Hammick et al., 2007; Abu-Rish et al., 2012). Indeed, a number of studies have advocated the use of early IPE in order to address the development of students' stereotypical views of other HCPs which are already present from the beginning of the undergraduate programme and can quickly become more exaggerated (Carpenter, 1995; Tunstall-Pedoe et al., 2003; Lindqvist et al., 2005), thus helping to build interprofessional relationships and prevent early development of professional silos and tribalism (Barr, 2000). Whilst IPE is required within schools of pharmacy and thus this research anticipated its delivery to be widespread, the data clearly showed that schools were beginning sessions from year one of the programme and continuing them throughout the degree. By providing a series of evolving sessions this can enable students to build on previous sessions and knowledge, aligning with the constructivist educational theory which considers that learning is the process of constructing new knowledge on the foundations of learners already know (Vygotsky, 1978).

Variability was observed in the different types of student practitioners that took part in IPE sessions. In total, students from 26 different disciplines were involved in IPE in addition to pharmacy students across the 88 IPE sessions described. In the main sessions featured medical and nursing students, with physiotherapy students also heavily featured. Careful consideration needs to be employed when designing IPE to ensure that respondent groups add value and are applicable to the theme of the session (Barr, 2002b). Indeed, Barr et al. (2017) have suggested that the growing popularity of IPE can result in a pressure to include an open-ended list of professions. This can have a detrimental impact on students' perceptions of IPE if they fail to see the relevance to their own practice in engaging with particular HCPs. For some of the IPE sessions reported, student groups who took part in IPE sessions with pharmacy students were from outside the healthcare disciplines and therefore were unlikely to practise alongside pharmacists post-graduation, questioning the relevance of these sessions (particularly those where these non-healthcare groups were the sole other student group alongside pharmacy students). In a general review of IPE within the UK conducted by Barr et al. (2014) they summarised that whilst many educators were ambitious and driven to develop and incorporate IPE then needed reminding that these sessions should be more than just ticking a box to satisfy a professional body, with students wanting to attend sessions that prepare them for future practice.

One challenge to educators in designing meaningful IPE is that there is currently no literature that indicates which HCPs pharmacists work with most frequently in practice (something explored in chapters 5 and 6). The consequence is that IPE is often developed based on the availability of student practitioners from other health disciplines in the local area, i.e. convenience is prioritised (Lapkin et al., 2013). This convenience could also extend to occasions where there are obvious alignments in respective student timetables leading to opportunistic development of IPE sessions. This perhaps explains why such a range of healthcare student groups was seen across the reported sessions. Another factor may be synergies with HCP programmes where there is a similar regulatory requirement for undergraduates to undertake IPE, e.g. with medical students (General Medical Council, 2009).

Another reason pharmacy educators may choose to engage with certain professional groups can be due to clear and relevant alignments in curricula. This was evident in a number of the IPE sessions described by respondents which saw the delivery of common shared topics such as prescribing (n=13) with medics, nurses and other prescribing professions. In a report related to the 'Aberdeen Interprofessional Health and Social Care Education

initiative' made to the Scottish Government which reviewed a range of IPE sessions across a three year period, Diack et al. (2008) also found pharmacy and medicine students recognised the benefits of focusing IPE on prescribing as it helped them understand the 'different roles and areas of expertise of doctors and pharmacists in the area of prescribing'. Other common topics identified across this current study included care planning, HCP roles and responsibilities, team building, patient safety, and professionalism and ethics, all of which are relevant for many UK HCP programme curricula therefore allowing for easier curriculum alignment (Steven et al., 2017).

The range of factors that influence the choice of HCP student groups engaged alongside pharmacy in IPE sessions could also have a similar impact on the number of HCP groups involved in each session. In the main, pharmacy students engaged with one other professional group during IPE sessions (60%). This is a finding that was supported in a literature review of IPE by Abu-Rish et al. (2012) which also showed that of the 83 studies reviewed sessions were mostly conducted with just two professions (42%). Some schools did report IPE sessions featuring a higher number of professions learning together during IPE sessions, with one school having eleven HCP student groups alongside pharmacy students during a single IPE session. Although this may enable wider exposure to student groups thus increasing the possibility to positively reinforce professional roles and stereotypes (Carpenter, 1995), involving more than one other profession can increase the scale of IPE thus making alignment of timetables and curricula more challenging (Levett-Jones et al., 2012). Additionally it may then become a challenge to maintain a relatively even balance between professional group numbers (Parsell and Bligh, 1998), something Reeves et al. (2012) argues is crucial in providing effective interprofessional interaction, as they believe that on occasions where the dynamic heavily favours one profession this may lead the profession to dominate sessions thus inhibiting the other professions engagement.

With the majority of sessions conducted with small numbers of different professional groups, other factors to the design of sessions may have contributed to this decision including the availability of competent, expert staff to facilitate sessions, a factor which is thought to be important in making students to feel more comfortable and increasing their likelihood to listen and engage (van Soeren et al., 2011; Abu-Rish et al., 2012), with the value of IPE seen to decrease if students believe the facilitator has a perceived lack of expert knowledge (Lapkin et al., 2012; Carpenter and Dickinson, 2014; Barr et al., 2017). Furthermore, pharmacy educators may have also found that large numbers of different professional groups involved in IPE exaggerated the challenge of ensuring relevance across

professions, which if not achieved can result in students developing negative connotations towards interprofessional working (Barr et al., 2017), thus making it more viable to focus on a small number of HCP groups and ensure that all students are actively engaged in sessions that accurately reflect their future professional practice.

Another challenge educators face when developing IPE sessions is aligning learning outcomes between courses (Barr et al., 2017). This can be problematic when learning outcomes for IPE are perceived to be general or vague and not compatible with the demands of the respective healthcare programme. This led Steven et al. (2017) to identify a number of common learning outcomes which overlapped across the five largest healthcare professional regulators in the UK (GMC, GDC, GPhC, NMC and HCPC), creating a framework for informing shared learning opportunities in prequalifying IPE curricula. The seven key learning outcome themes defined by Steven et al. (2017) were subsequently used within this study to frame the 207 outcomes described by respondents across 71 IPE sessions (17 missing data sets). Of these, teamworking was the most common learning outcome set by educators and included getting students to communicate and work together, and often aimed to increased students' understanding of one another's roles. These learning outcomes align particularly well with many of the cited goals for IPE (Greiner and Knebel, 2003; Freeth et al., 2008; Thistlethwaite, 2012). Of note, Thistlethwaite and Moran (2010) found that many institutions assume that students meet the learning outcome of 'improving interprofessional team working' simply through participating in IPE, i.e. the learning outcome is implicit. This may explain why nearly 20% of the sessions described within this study did not feature improved interprofessional teamworking as a stated outcome. This practice should be challenged as setting specific learning outcomes encourages educators to be responsive and flexible in the development of sessions helping ensure students achieve the skills or knowledge desired (Reeves, 2012).

Beyond improving interprofessional teamwork, a number of other learning outcomes were frequently reported including skills for practice such as communicating with patients and prescribing skills, knowledge for practice such as learning about patient conditions, as well as improving students' professional and ethical skills, having a patient-centred approach and continuing the student's professional development. Interestingly, many of those learning outcomes set by pharmacy schools for their IPE sessions aligned with the six IPE learning outcomes specifically identified by the World Health Organisation (2010): (i) teamwork; (ii) roles and responsibilities; (iii) communication; learning and critical reflection (i.e. reflecting on own role within the team and transferring to practice);

relationships with, and reflecting the needs of, the patient; ethical practice. This data shows that IPE provides a platform for educators to equip students with the skills required for interprofessional collaboration in practice and can therefore complement the surrounding uniprofessional syllabus.

All of the outcomes identified could also be directly mapped onto the learning outcome framework developed by Steven et al. (2017). This highlights that the session outcomes had relevance across HCP student groups and was not limited to pharmacists (at least for those who are part of the five largest UK HCP regulators). This is likely to enhancing students' interest and engagement in sessions (Knowles, 1973; Parsell and Bligh, 1998; Jonassen, 1999). However, it is important to note that although outcomes align across professions they may not be taught to the same extent or depth therefore educators should design sessions which include outcomes which are pitched at the right level for all students, particularly if sessions are taught between professions in differing year groups, i.e. at different points of their professional development (Parsell and Bligh, 1998). Whilst the year group of the pharmacy students involved in IPE sessions was captured in this study, the year group of the other HCP students taking part was not always clear. It is therefore difficult to conclude whether the year groups engaging IPE sessions were deliberately selected to align with respective curriculums or were chosen for pragmatic reasons related to operational delivery. Nevertheless, it is important to recognise that if there is a clear mismatch in the year groups participating in IPE particularly in terms of their level of professional development, students may question the relevance of the sessions. This is especially true one group of students act as 'teachers' in sessions limiting their opportunity to learn 'with, from and about' their colleagues. This can result in a real or perceived imbalance of 'power' in the developing professional relationships (Baker et al., 2011; Jenkins, 2013; Carpenter and Dickinson, 2014).

One of the major challenges in sustaining IPE is demonstrating its value highlighted by the limited number of 'high quality' studies around IPE (Zwarenstein et al., 1999; Zwarenstein et al., 2005; Reeves et al., 2010c; Thistlethwaite and Moran, 2010; Abu-Rish et al., 2012) due to the poor rigour of investigations as well as the "wholesale lack of consistency in defining and describing learning outcomes and their assessment" (pg. 507) (Thistlethwaite and Moran, 2010). This was something apparent within this study with 17 sessions described as not featuring learning outcomes and only half of the IPE sessions featuring any assessment of the learning outcomes.

Where learning outcomes were assessed the method of assessment was varied. The most common measure was completion of reflective accounts or continuing professional development (CPD) entries. Whilst these methods help students to reflect on their own development and identify areas their collaborative practice may need improvement, they do not represent an objective assessment of a student's understanding or application of the skills or knowledge articulated in the learning outcomes. Their value is therefore questionable, with Barr et al. (2017) for example suggesting that assessments of IPE should aim to directly demonstrate each student's competencies in collaborative practice, a feat which is not easily achieved due to the practical nature of the skills IPE sessions often aim to develop. In addition, a small number of sessions utilised written summative assessments of learning outcomes including exams and written reviews. Whilst these assessment types can increase the value students place on IPE learning opportunities (Barr et al., 2017), their notable drawback is that they are not compatible with assessing communication and teamwork skills i.e. they are not constructively aligned with the learning approaches (Simmons and Wagner, 2009; Thistlethwaite, 2012).

During the MPharm programme, pharmacy students are required to 'show' that they have acquired a range of skills or knowledge (Miller, 1990; General Pharmaceutical Council, 2011). One assessment technique used to measure this is OSCEs, a method which uses separate stations to objectively assess students' clinical competencies (Harden and Gleeson, 1979). With the GPhC requiring students to 'show how' to undertake interprofessional competencies such as providing "accurate written or oral information appropriate to the needs of patients, the public or other healthcare professionals" (pg. 38) (General Pharmaceutical Council, 2011) OSCEs are increasingly used as a method of assessing IPE. Indeed, in this study the learning outcomes of eight IPE sessions were described to be assessed by OSCEs. It is not clear however whether these were uniprofessional OSCEs, interprofessional OSCEs (iOSCEs) or team OSCEs (TOSCEs); iOSCEs and TOSCEs have been specifically developed to emphasise the assessment of interprofessional competencies (Morison and Stewart, 2005; Simmons et al., 2011; Gordon et al., 2013).

Of note, Thistlethwaite and Moran (2010) and Abu-Rish et al. (2012) have both found that educators often dispense with direct assessment of students against the learning outcomes and instead focus on evaluations of the sessions themselves through student feedback. Indeed, in this current study 57 sessions featured a student evaluation of the session, compared to 42 sessions in which students' learning outcomes were assessed. Of these student evaluations, the majority (n=30/57) were through the use of the RIPLS

questionnaire developed by Parsell and Bligh (1999) or a similar student perception survey. Whilst RIPLS is a well-known and accepted approach to evaluating IPE sessions, Mahler et al. (2015) found that it has a number of drawbacks including inaccuracies in the measurement and comparison of data (i.e. it has a limited degree of certainty as it measures HCP students' perceptions of IPE and interprofessional working which are often positive irrespective of the session), which have been generally overlooked by researchers in need of an instrument. A further drawback to such tools is that they evaluate students' perceptions of their learning and the impact of sessions on that learning. This is a subjective measure and therefore it is difficult to accurately objectively evaluate the value of the sessions (Parsell and Bligh, 1999). A further issue is that such surveys may be self-fulfilling as students are told that interprofessional practice is positive and beneficial to their development. This results in an overwhelming number of such evaluations demonstrating students have positive opinions of the IPE session in which they have taken part (Rosenfield et al., 2011; Abu-Rish et al., 2012; Lapkin et al., 2013; Carpenter and Dickinson, 2014) with few studies showing students have a negative opinion of IPE sessions (Thistlethwaite, 2012).

However, although there are a number of drawbacks to such evaluations, when used judiciously and in a mixed methods approach they can be useful in identifying areas of improvement needed for the sessions themselves, an approach that was evident across a small number of sessions described in this study (questionnaire evaluations and interviews). In addition, as IPE is a relatively expensive form of teaching due to its interactive nature, the relatively higher student:staff ratio and practical resource implications (Abu-Rish et al., 2012), sustained funding and indeed staff engagement is essential but often problematic (Freeth et al., 2008). By assessing or evaluating sessions and demonstrating sustainability can be ensured.

In addition to RIPLS, a variety of others tools are available including The Interdisciplinary Education Perception (IEPS) and The Interprofessional Attitudes Questionnaire (Freeth et al., 2005), as well as newer instruments which are grounded in theoretical frameworks to measure different aspects of interprofessional competencies (Mahler et al., 2015). These include the Interprofessional Education Collaborative Competency Self-Assessment Tool, Performance Assessment Communication and Teamwork Tools Set (PACT) and Communication Assessment Tool- Team (CAT-T), to name but a few. Indeed, nearly fifty evaluation methods are listed on the website of the US National Centre for Interprofessional Practice and Education - <https://nexusipe.org/measurement-instruments>. Of note, with the

exception of the RIPLS tool, no schools indicated the use of any other evaluation tool. The inadequacies of the tools employed to evaluate IPE sessions described in this study are in agreement with a number of reviews of IPE which have highlighted the need for further rigorous mixed method studies to provide greater clarity on the impact of IPE on professional practice and patient care (Zwarenstein et al., 1999; Zwarenstein et al., 2005; Reeves et al., 2010c; Thistlethwaite and Moran, 2010; Abu-Rish et al., 2012).

#### **3.4.1. Limitations**

Total population sampling was used to map the landscape of UK schools of pharmacy, and although a response rate of 58.6% was achieved, a greater response rate would have been beneficial in aiding the generalisability of the data (Babbie, 2015d). Indeed, the schools that did not respond may have taken novel approaches to IPE that are not present in other schools. Furthermore, given the study relied on responses from educators within the schools who had specific responsibility for, or interest in, IPE there may have been some bias in the responses received as educators may have felt compelled to positively reflect their schools IPE strategy. This may have contributed to the feelings of one educator who expressed that they would not participate due to the 'sensitive nature' of the information and may explain why other schools did not participate. Additionally, the competitive nature of higher education may have left educators feeling unwilling to share information with other schools.

Although the questionnaire was designed to gather required data but be a reasonable length to aid participation, as some schools provided information on a large number of sessions this resulted in the questionnaire being more time-consuming for some than expected. This may have impacted on the nature of their responses which were observed to be brief in places, an issue that may also have been compounded by the Google Docs platform which required respondents to complete the questionnaire in one go as it contained no save function. However, whilst this additional information may have been of interest it is unlikely that the further information would have significantly impacted on the conclusions drawn from this study.

Retrospectively, an interesting addition to this questionnaire would have been to explore the educational theories and strategies that underpinned educators design of IPE (if there were any), as this would have helped add to an area of IPE literature that currently lacking (Reeves and Hean, 2013).

### 3.5. Conclusion

This study has explored the landscape of IPE undertaken across UK schools of pharmacy (17/29 schools participated) and identified clear variation in all aspects of IPE including: (i) the number of sessions conducted by each school (ranging from 1 to 20); (ii) the MPharm year group undertaking sessions (relatively evenly spread across all four years); (iii) the range of student groups involved in each session (26 different student groups involved across the 88 sessions described); (iv) the number of student groups involved in each session (ranging from 1 to 11 student groups alongside pharmacy students in a single session); (v) the environment in which the sessions took place; (vi) the theme/topic of each session; (vii) the learning outcomes for the sessions; (viii) the method (if any) of assessing outcomes; (ix) the method (if any) of evaluation outcomes. Whilst the IPE delivered clearly varied, there were also some commonalities that were identified across sessions. Undertaking sessions alongside one other HCP was most common, with medical students taking part in three-quarters of the 88 sessions detailed. The majority of schools delivered sessions across all four MPharm years and in the main utilised workshop rooms over practice-based and simulation sessions. The learning outcomes educators set for students to achieve most frequently focused on the development of interprofessional teamworking and communication competencies, however students were rarely assessed on these outcomes likely due to the challenge in doing so.

This study has ultimately provided a greater understanding of the current undergraduate pharmacy IPE provision in UK MPharm programmes and may help guide pharmacy educators to recognise the similarities and differences in their IPE delivery and prompt them to reflect on their IPE provision. Whilst certain IPE approaches were favoured by educators, it was not possible to ascertain if they are reflective of modern pharmacy interprofessional practice and thus of optimal value to students. Therefore, in order to further develop effective and relevant IPE it is important to understand pharmacists' interprofessional engagement in the workplace such that meaningful IPE can be developed that is authentic to contemporary practice.

**Chapter 4 - Who do pharmacists work with? - General  
methodology and methods**

## 4.1. Methodology

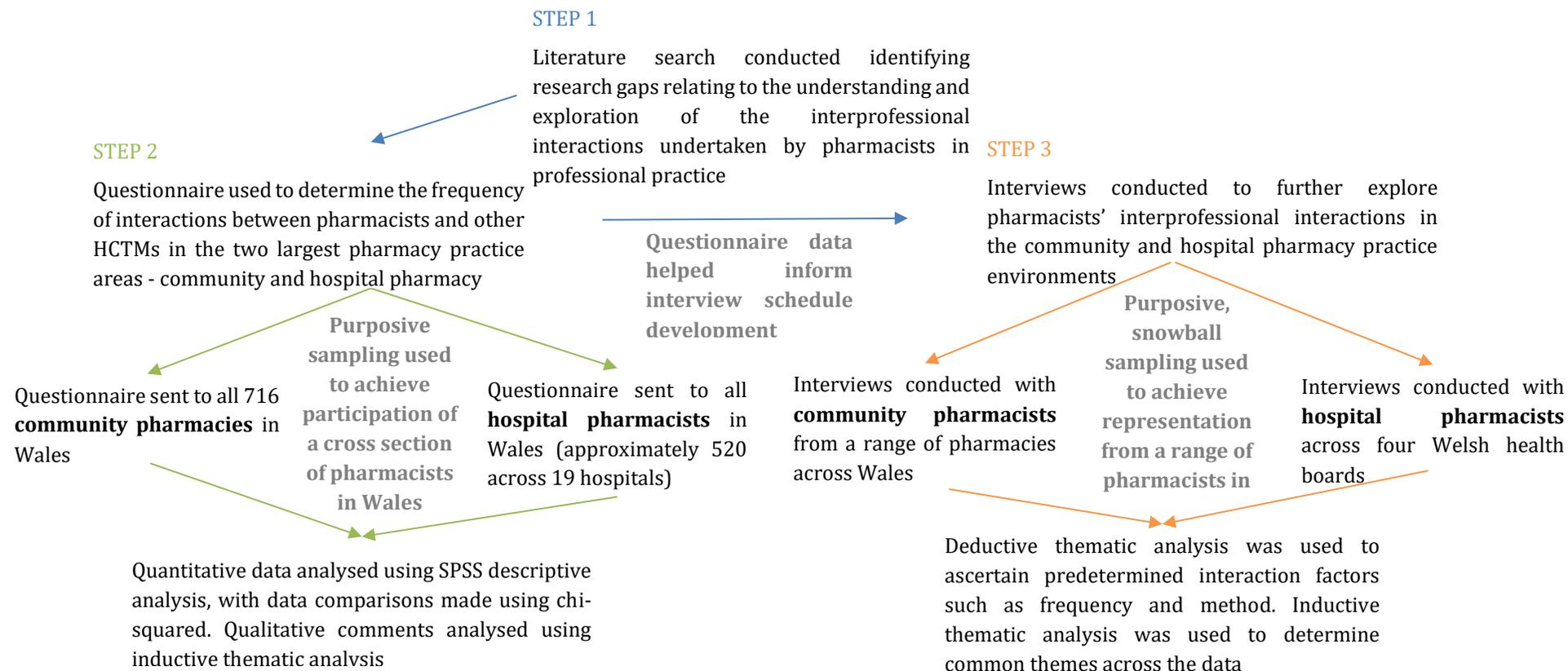
As discussed in chapter 2, there has been a significant drive across healthcare sectors to integrate HCPs in interprofessional teams in order to provide more efficient and holistic patient care (Department of Health, 2010; World Health Organisation, 2010). Pharmacists represent the third largest health professional workforce in the UK (General Pharmaceutical Council, 2018d) and in recent years there has been a desire to further utilise their skills and knowledge resulting in an expansion of the pharmacist role (Royal Pharmaceutical Society, 2015). Despite the expansion of the role, there is a concern that in the main the profession continues to practice in silos (Ray, 1998; Department of Health, 2010; Royal Pharmaceutical Society and Royal College of General Practitioners, 2011; Primary Care Workforce Commission, 2015). Given the paucity of literature examining interprofessional engagements that pharmacists undertake in practice this concern may be perceived rather than real. It is therefore important to understand the nature and extent of interprofessional practice as well as any facilitators and barriers to such practice in order to further advance and support pharmacists' interprofessional working. This chapter therefore discusses the general methodological approach and sets out the general methods used to identify the frequency and nature of interprofessional interactions pharmacists undertake in pursuit of their professional practice (see section 4.2 and beyond). Whilst this chapter details the general mixed methods approach used throughout the studies presented in Chapters 5 and 6, the specific nuances and practicalities in conducting the questionnaires and interviews in the community and hospital settings are further described within the relevant chapter.

### 4.1.1. Methodology development

When conducting research it is important that the research question guides the methodological approach (Corbin and Strauss, 2008). The researcher identifies themselves as a pragmatist (see section 4.1.2 for more details) and therefore priority was given to gathering meaningful and relevant data which was applicable to answering the research question through whichever methodological approach was most relevant (Johnson and Onwuegbuzie, 2004). As the aim of this study was to determine and explore the interprofessional interactions (IPIs) taking place between pharmacists and other HCPs, a mixed methods approach was best suited to obtain useful data for this complex topic. A mixed methods approach refers to one which collects and analyses both quantitative and qualitative data to address the aim of the study (Tashakkori and Teddlie, 2010). This approach was chosen for this study in order to utilise the varying strengths of the two (often

opposing) research methods and reduce the limitations and restrictions of undertaking a qualitative or quantitative approach alone (Johnson and Onwuegbuzie, 2004).

This mixed methods study was conducted in a sequential manner – questionnaire followed by semi-structured interviews. This allowed the data to be collected iteratively, and findings from the quantitative questionnaire were used to inform the qualitative interviews. This allows for a more focused and in-depth exploration of the subject (Driscoll et al., 2007). The two-step approach commenced with a self-complete questionnaire that was administered to large numbers of pharmacists to determine precise, numerical, generalisable data related to respondents' reported frequency of interaction with healthcare team members (HCTMs – comprising of HCPs and other staff within the healthcare team). This was then supplemented by qualitative, face-to-face, semi-structured interviews with pharmacists to explore these complex interactions in more detail, including how and why interprofessional interactions occur, thus giving context and meaning to the quantitative data. Using a sequential method helped to better select interview participants who could provide further information related to particular areas of interest identified through questionnaires. This approach also helped to make findings representative of the pharmacist population (Creswell and Creswell, 2017) and meant that data could be triangulated (Babbie, 2015b). The study was conducted in Wales in the two largest pharmacy practice settings, namely community and hospital pharmacy (see chapters 5 and 6 respectively)(General Pharmaceutical Council, 2018b). **Figure 4.1** provides a general overview of the study design and methods used.



**Figure 4.1.** Study design overview for mixed method exploration of pharmacists' interprofessional interactions in practice

#### **4.1.2. Epistemological and ontological view**

Reflexivity is the notion of being sensitive to the ways the research has been conducted as well as the researcher's own assumptions and experience that may impact on the research process (Mays and Pope, 2000). Although the generic qualitative research approach relies less on any particular philosophical underpinnings, having an awareness and recognition for my own ontology (whether there is an objective reality) and epistemological views (how this reality is perceived) is crucial and is shared here for clarity (Caelli et al., 2003).

My own view is that of a pragmatist. This is a philosophy of science which focuses on the empirical problems at hand, taking each in turn, resulting in a somewhat flexible social ontology (Frankel Pratt, 2016). The pragmatist view is contradictory to the way ontology is generally defined, with many researchers categorising themselves as based on their belief as to whether there is an objective reality. Bauer and Brighi (2002) believe that pragmatism looks "beyond the epistemological stalemate opposing positivism and post-positivism, pragmatism invokes a methodological pluralism and disciplinary tolerance [and] encourages a multi-perspectival style of inquiry that privileges practice and benefits from the complementarity, rather than opposition". Frankel Pratt (2016) also argues that the pragmatist stance is considered as both an epistemological and ontological view as it dissolves the specificity and rigidity across the two opposing ontological views, promoting flexibility and the belief that embracing and utilising these views can help foster valuable and tailored research. This means that, as a pragmatist, my focus is much more on the outcomes of research and the use of the most applicable method to achieve these (Johnson and Onwuegbuzie, 2004), thus prompting the application of mixed methods which could fulfill the aims of determining and exploring the interactions taking place between pharmacists and other HCTMs.

#### **4.1.3. Reflection on previous experience in the area**

Although social researchers aim to be objective when undertaking studies, this can be a challenge, particularly as it is not only the researcher's philosophical views but their own past experiences that can also have an impact on the research (Babbie, 2015b). Therefore, it is important to acknowledge my own experience and recognise how this might impact the study (Caelli et al., 2003).

As these studies focus on community and hospital pharmacists and their experiences, as a practising pharmacist with experience in both environments I too have perceptions of the

interactions taking place within these areas. Therefore, whilst consciously aiming to remain objective and impartial, my subconscious preconceptions may have unintended impact on the generation of questions and the development of inductive themes within the data. In contrast, my experience may also have a positive impact on the research, as my understanding of the area may allow more in-depth determination of themes. My role as a pharmacist may also put the participants at ease when undertaking the interviews as I may be viewed as a peer rather than simply a probing researcher. I therefore ensured that I introduced myself and my professional background before conducting each interview.

### **4.2. Study methods**

#### **4.2.1. Study location**

The study was conducted in Wales in the two largest pharmacy practice settings, namely community and hospital pharmacy (see chapters 5 and 6 respectively)(General Pharmaceutical Council, 2018b). Although the expansion of roles has also seen the incorporation of pharmacists into other practice areas particularly GP practices (Primary Care Workforce Commission, 2015), due to the recent introduction of these roles combined with the relatively small numbers of pharmacists operating in such settings, at least comparatively to hospital and community, these ancillary settings were excluded from the study.

The research conducted within this thesis was undertaken within Cardiff School of Pharmacy and Pharmaceutical Sciences (CSPPS), the only school currently delivering the MPharm degree within Wales. The interprofessional interactions of pharmacists within Wales was therefore of particular interest and hence all the questionnaire respondents and interview participants practiced pharmacy within Wales (see Figure 4.1).

Across the UK the NHS is devolved and managed by each of the four independent countries: NHS England, NHS Wales, NHS Scotland and the affiliated Health and Social Care (HSC) in Northern Ireland. This project focuses primarily on NHS Wales, therefore where there are specific nuances, for example surrounding the role of the pharmacist and other HCPs and the delivery of specific pharmacy services, these are directly associated with the Welsh healthcare system. Where applicable similarities and/or differences between healthcare delivery across countries have been noted. However the variations between NHS nations have been noted, as the GPhC regulates all pharmacists across the UK the same minimum standards must be met and therefore much of this research is applicable and relevant for

pharmacists across the UK and potentially further afield. The structure of the NHS in Wales altered dramatically in 2009 by creating 7 distinct Welsh Local Health Boards (LHBs), namely Aneurin Bevan Health Board; Abertawe Bro Morgannwg University Health Board; Betsi Cadwaladr University Health Board; Cardiff & Vale University Health Board; Cwm Taf Health Board; Hywel Dda Health Board; and Powys Teaching Health Board. There are also three additional trusts within Wales: Velindre NHS trust, Welsh Ambulance Service and Public Health Wales. As the Welsh Ambulance Service and Public Health Wales did not directly provide dedicated in-house pharmacy services they were excluded from the study. Conversely, as Velindre (a specialist cancer trust) provided dedicated in-house pharmacy services within their hospital, pharmacists here were included within the study. See NHS Wales (2018b) for further details surrounding the Welsh NHS structure.

#### **4.2.2. Ethical considerations**

Ethical approval for the questionnaire and interview studies was obtained from CSPPS Research Ethics Committee (see Appendix B).

In addition to University level approval, ethical approval was also sought from the Research and Development Committees within each LHB for both the questionnaire (all LHBs approved) and interviews (five of six applicable LHBs approved) to be conducted with hospital pharmacists. Further ethical approval was granted for both study stages (questionnaire and interviews) to be conducted with pharmacists working within Velindre University NHS Trust.

Further approval was required and granted from Boots Research Governance Department to allow for distribution of the questionnaires and follow up interviews to be conducted with community pharmacists working within Boots UK stores in Wales.

Throughout the study, participants were assured of the confidentiality of their responses. This meant that personal and identifiable information provided by individuals was not discussed with others and the results presented throughout chapters 5 and 6 ensure that no individuals can be identified (Wiles et al., 2008). This was chiefly achieved through the anonymity of questionnaire participants and the anonymisation of interviews. Confidentiality was maintained by keeping any specific details or information which may identify participants in either locked cabinets or on password protected computers. This information was then deleted or destroyed once the study was completed.

### **4.3. Questionnaire methods**

The first stage of this mixed methods study sought to quantify the perceived frequency of interactions (defined as any activity that involves direct engagement/communication with another person irrespective of the topic, frequency or nature (i.e. collaboration/teamwork), stated as 'direct personal interactions (either face-to-face, by phone or by email)' within the questionnaire) between community pharmacists and other HCTMs (comprising of HCPs and other staff within the healthcare team) through a self-complete questionnaire which was administered to all community pharmacies in Wales. The questionnaire was designed to be predominantly quantitative in order to determine precise, numerical and largely generalisable frequency data related to pharmacists interprofessional interactions whilst remaining relatively quick and easy for the respondent to complete (Johnson and Onwuegbuzie, 2004). This method was chosen in order to gain a good understanding of the extent of interprofessional interactions taking place which could then help inform purposive interviewee selection to enable deeper exploration of findings and gain the most valuable data possible (Creswell and Creswell, 2017).

#### **4.3.1. Sampling**

To ensure that the data collected was representative, purposive sampling was used when administering both community and hospital questionnaires (Babbie, 2015c). Purposive sampling is a form of non-probability sampling which was used in order to identify participants within a specific demography (Teddlie and Yu, 2007). The study purposively aimed to achieve participation from a cross section of pharmacists in Wales. This was achieved through dissemination to all community pharmacies (n=716) and hospitals containing dedicated in-house pharmacy departments (approximately 520 pharmacists spread across 19 different hospitals) working in Wales at the time of the study, which helped achieve a large representation of pharmacists aiding the generalisability of results (Babbie, 2015c).

#### **4.3.2. Inclusion/exclusion criteria**

Although purposive, total population sampling was used to reach all community pharmacies and hospital pharmacies/departments across Wales, the cover letter also made it clear that all respondents needed to be qualified pharmacists working within the pharmacy/department for at least two days a week (see Appendix F). This was to ensure that the responding pharmacist had a good understanding of the IPIs occurring within that specific community pharmacy or hospital.

### 4.3.3. Questionnaire design

One of the main aims of this mixed method study was to determine the frequency of IPIs pharmacists undertake in practice. Therefore, this predominantly quantitative questionnaire was created to directly answer this question and was developed from a mixture of prior experience and knowledge of the pharmacy profession by the researcher (see section 4.3.3) in addition to having a thorough understanding of the pharmacy and interprofessional literature available (see chapter 2 for details of the literature reviewed and utilised) and by iteratively amending the questionnaire following pilots (see section 4.4.5).

The questionnaire (see Appendix E or M) was separated into three sections that were designed to facilitate ease of completion through the use of predominantly quantitative 'closed' questions (Kumar 2014). The questionnaire was also designed to be short whilst still gathering the desired data and was printed on blue coloured paper to help increase response rate (Edwards et al., 2009).

Demographic information for each respondent was gathered in section A. This was tailored to the nature of the care setting (community vs hospital), with the primary focus to find out the regular 'position' of the participating pharmacist (e.g. their managerial/ownership role in community or their specific speciality/banding within hospital), the environment in which they predominantly operated (e.g. ward, office etc.) and the services they provided.

Section B contained a non-exhaustive table listing common healthcare professionals and team members (jointly referred to as HCTMs throughout this thesis) from community, primary and secondary care settings. As there is no previous research citing the frequency and range of HCPs pharmacists work with in practice a list of possible professions was created from professions listed on the NHS careers website (NHS Health Education England, 2015). Wider members of the healthcare team such as dispensers in the pharmacy and receptionists in the GP practice were also included for completeness in determining pharmacists' overall interactions. As the list was not exhaustive a free-text box was included for respondents to note the frequency of interaction with any other professions not listed. The perceived frequency of interactions could be described on a six-point ordinal scale: at least once a day, at least once a week, at least once a month, at least once a year, less frequently, never. This scale allowed the respondent to indicate the frequency with which they perceived they had 'direct personal interaction' with HCTMs, which was defined for respondents to include face-to-face discussions, telephone exchanges, or email

communication. Ordinal scales such as this have been used widely and effectively throughout psychological and educational research and was chosen as this provided a pragmatic way to achieve desired results (Stevens, 1946).

Section C of the questionnaire allowed respondents to provide any other comments they wished to make regarding their own IPIs.

### **4.3.4. Consent**

Consent for participation was implied when the pharmacist completed and returned the questionnaire.

### **4.3.5. Piloting questionnaires**

The community pharmacist questionnaire was initially piloted with six practising pharmacists prior to wider dissemination. During the pilot each participant completed the questionnaire and gave verbal feedback regarding any issues related to content and face validity (Babbie, 2015d). As a result of the pilot, a number of minor refinements were made to the questionnaire including the wording and structure of demographic (section A) questions (i.e. suggestions for the range of the number of GP practices community pharmacists regularly work with) and the clarity of each HCTM listed in section B (i.e. the term Healthcare Assistant added to the Medicines Counter Assistant to aid the general understanding of this role). The hospital pharmacist questionnaire was similarly piloted (n = 3) and again a number of refinements to the questionnaire were made based on the feedback around the wording and structure of the demographic questions (i.e. the specialties listed for hospital pharmacists expanded).

### **4.3.6. Reliability and validity**

In order to enhance the accuracy of the questionnaire it was important that it was both reliable and valid. (Golafshani, 2003). The validity (i.e. the extent to which the questionnaire measured the frequency of interactions) is closely associated with reliability (i.e. the ability of the questionnaire to measure the frequency of interactions consistently), and a questionnaire cannot be valid unless it is reliable. The reliability of each questionnaire was therefore objectively measured by determining Cronbach's alpha in IBM SPSS statistics data editor® version 20 (SPSS)(Tavakol and Dennick, 2011). Here, the expected correlation of the data sets against one with perfect reliability was compared (Riffenburgh, 2012). The values determined range between 0 and 1, with values closer to 1 showing higher levels of internal consistency (Tavakol and Dennick, 2011). With a Cronbach's alpha value calculated 98

as 0.880 for the hospital questionnaire and 0.859 found for the community questionnaire the questionnaire demonstrated high levels of reliability particularly as values of 0.7 and above are generally accepted as appropriately reliable (Bland and Altman, 1997).

#### **4.3.7. Questionnaire dissemination**

In order for results to be generalisable a high response rate was needed. Paper copies of each questionnaire were therefore disseminated as studies have found increased response rates when compared to web-based questionnaires (Bälter et al., 2005; Babbie, 2015d). Respondents were provided with information and instructions regarding the study in two forms. An introduction page preceded the questionnaire detailing how the questionnaire should be completed, specifying that all answers provided should be based on the pharmacists' own experiences. A cover letter was also provided that explained the study, including study aims and a reassurance of confidentiality when submitting responses (Kumar, 2014). The manner in which questionnaires were disseminated was distinct to the community and hospital pharmacy sectors; further details can be found respectively in chapters 5 and 6. Each questionnaire was uniquely coded so that responses could be monitored, and an overall response rate could be calculated as well as to identify non-respondents such that reminders could be targeted.

#### **4.3.8. Data handling**

Data from returned questionnaires was input into SPSS for statistical analysis and a 10% data check was completed to validate data input (Babbie, 2015d). If no response was made to a particular question then a separate 'missing' code ('99') was used to indicate this. In addition, if certain questions had multiple responses then a separate code was given for each response.

The frequency of interaction the pharmacist had with different healthcare professionals was coded ranging from '1' for 'at least once daily' up to a code of '6' for 'never'. If respondents gave no response for a number of HCTMs and did not select 'never' for any other HCTMs then it was assumed that no interactions occurred and a code of '6' was used to indicate the interaction 'never' occurred. If the response was unclear or multiple frequencies were provided for an individual HCTM then this data was classed as 'missing' and given a code of '99'. Respondents' qualitative written comments provided in the free-text 'other' boxes or in section C of the questionnaire were input verbatim into Microsoft Word 2011® version 14.4.9 (MS Word). The questionnaire code and question number were noted next to each comment for qualitative analysis.

### **4.3.9. Data analysis**

Analysis was conducted by two separate methods dependent on the nature of the data.

#### **4.3.9.1. Quantitative analysis**

Descriptive statistics for the pharmacists' frequency of interaction with each HCTM and the demographic data associated with respondents were generated in SPSS. As the scale used was ordinal and therefore non-parametric (data does not fit normal distribution) it was important to select and use the appropriate statistical tests and thus exclude tests such as median and percentile (Stevens, 1946). One statistical analysis method that was appropriate for this data set was Pearson's chi-squared statistical test (also referred to as goodness of fit). This test was chosen as it could compare the distribution of a large sample of ordinal frequency data (i.e. the shape of the data) for each profession with each nominal population group (i.e. physical location of pharmacists)(Clegg, 2001). The test was used to identify the respondents' demographic traits (i.e. physical location, services provided, etc.) that significantly ( $p$  values set at  $p < 0.05$ ) impacted their frequency of interactions with other HCTMs when compared with their other pharmacist colleagues. Whilst the statistical test identified significant differences between data it does not determine where the statistical differences lie and therefore visual comparisons were conducted to understand the nature of these differences (Riffenburgh, 2012). Visual comparisons involved a manual visual check of the spread of the frequency data for one demographic trait in comparison to others when significant differences were seen. This was conducted by the PhD researcher and subsequently confirmed by research team. In order to conduct the chi-squared analysis the data had to satisfy a number of criteria including less than 25% of cells required an expected cell count less than five, and the minimum expected cell count had to be greater than one. These parameters ensured that there was enough spread of data across the cells to make the test valid (Hinton, 2014). In a small number of cases, in order to fulfill these requirements frequency categories were combined. This primarily occurred when no participants reported interactions at the ends of the scale i.e. at least once a day or never (results in chapters 5 and 6 show the occasions where categories were combined).

#### **4.3.9.2. Qualitative analysis**

Section C enabled respondents to provide additional comments relating to their IPIs. These comments were analysed using deductive thematic analysis to identify any comments which reflected the frequency of interaction they had with other HCTMs (Braun and Clarke, 2006).

#### **4.4. Semi-structured interview methods**

Informed by results from stage one (the questionnaire), semi-structured face-to-face interviews were sequentially conducted with pharmacists to elucidate the nature of IPIs with healthcare professionals (HCPs) and determine the value they place on IPE. This stage helped enable triangulation of the research, allowing findings from the questionnaire and other areas of interest be further explored (Babbie, 2015b).

##### **4.4.1. Qualitative research design**

Qualitative research is a valuable tool which can be used to understand the dynamic, evolving nature of complex professional relationships (Corbin and Strauss, 2008). The use of qualitative research allows more in depth exploration and description of a participant's experiences or beliefs compared to quantitative methods (Babbie, 2015b).

Within pharmacy practice, qualitative research is used with increasing regularity to understand complex social, educational and patient orientated problems (Smith, 1998) as it helps explore experiences, behaviors, emotions and gathers the participants' perspectives (Auta et al., 2017). There are a large range of qualitative methodologies and approaches including narrative, phenomenological, grounded theory, ethnographical and case study amongst others which require the researcher to hold or assume a specific philosophical (Creswell and Poth, 2017). However, whilst these approaches are frequently used within healthcare and pharmacy practice research, this could potentially be because researchers feel obligated to use a specific methodological approach, with the hope that this will validate and provide a structure to their research process (Denzin and Lincoln, 2008). However, Auta et al. (2017) make the case that due to the limitations of these methodologies, such as the rigidity in the philosophical and analytical process which may not suit all researchers and data sets, the use of a 'generic qualitative' research approach is of value. This approach seeks to 'discover and understand a phenomenon, a process, or the perspectives and world views of the people involved' (Merriam, 1998) rather than place significant emphasis on the philosophical underpinnings (Caelli et al., 2003). This approach has often been used when researchers have been unable to find a methodological approach which suits their study, prioritising the research aim over the philosophical stance, with a desire to accurately represent participants' views (Cooper and Endacott, 2007).

After reviewing a range of methodologies, the researcher concluded that a generic qualitative research approach would be most suited in order to address the research aim of

exploring and understanding pharmacists' IPIs in practice. The specific methodological approach for the interview design and analysis are therefore discussed below.

Although this generic qualitative approach has less reliance on any prescribed philosophical underpinnings, Caelli et al. (2003) believe that it is important to recognise the researcher's philosophical views and personal experience in order to be reflexive throughout the study and reduce potential bias (Mays and Pope, 2000); these considerations are highlighted in sections 4.3.2 and 4.3.3. In addition, Caelli et al. (2003) also suggests that a clear explanation of the specific methods used, and the rigor with which they are conducted, is essential in generic qualitative research in order to achieve research clarity and these have therefore been described in this methods section.

### **4.4.2. Overall qualitative approach**

In order to conduct this research a series of semi-structured qualitative interviews were used to explore pharmacists' interprofessional experiences with HCPs. As the interviews followed the questionnaire phase of the study, this allowed for triangulation of data, enabling the interview to be more focused and explore areas of interest such as the HCPs pharmacists most frequently interacted with (identified through questionnaires) (Babbie, 2015b). The participants' method of communication, nature and content of IPIs, facilitators and barriers to IPIs, past experiences and views of IPE, and topics (if any) they learnt from other HCPs were all explored.

### **4.4.3. Sampling**

As discussed in section 4.2.1, purposive sampling is a form of non-probability sampling which is used to identify participants within a specific demography (Teddlie and Yu, 2007). This sampling method was therefore used for interviews as it enabled careful selection of participants where further exploration and data triangulation was desired (e.g. those working in community pharmacies in certain locations or with a particular role or positions within the hospital). This method enables a greater depth of information to be gathered from a smaller number of cases in comparison to probability sampling (Teddlie and Yu, 2007). Snowball sampling was also used when needed, with participants recommending other possible interviewees that fit the desired participant inclusion criteria (King and Horrocks, 2010a; Babbie, 2015c). At the end of the study, the objective was to have representation from a minimum of one participating pharmacist in each of the different demographic characteristics (see chapters 5 and 6 for specific sampling frameworks) in order for the data to reflect the overall pharmacist population in Wales (Mays and Pope,

2000; Creswell and Creswell, 2017). It must also be stated that for the purposes of the study, whilst the interviews sought to expand on the findings of the questionnaire phase of the research, prior completion of the questionnaire was not a prerequisite for taking part in the interviews. This allowed for a larger sampling range and encouraged involvement of those who may have been previously disengaged. Participants were provided with the same pre-interview information irrespective of whether they had participated in the questionnaire study.

A definitive sample size was difficult to state before conducting the study as the aim of recruitment was to include participants (from a range of demographic backgrounds) until there was a strong repetition of data and themes and the aims of the study had been achieved (Corbin and Strauss, 2008; Malterud et al., 2015). Although methodologies such as grounded theory employ the notion of 'theoretical saturation' (where sampling is continued until no new insights are obtained, no new themes identified and no issues are found related to a category of data (Corbin and Strauss, 2008)) researchers have argued that this is challenging to achieve and is not appropriate for all studies, particularly those of an exploratory nature as is the case here (O'Reilly and Parker, 2013; Morse, 2015). One concept recently adopted by qualitative researchers is 'information power'. This is a form of internal validity that determines the potential of available data to provide access to new knowledge by assessing factors such as the sample adequacy, data quality and variability of participants rather than just focusing on the sample size (Malterud et al., 2015). As the interviews explored the personal nature of individuals' interprofessional experiences, by gathering rich data from pharmacists with a range of experiences and demographic characteristics across Wales, recruitment continued until it was judged that the sample size was sufficiently large and varied that the researcher could be confident that the sample had accurately achieved the aims of the study i.e. to elucidate the nature of IPIs with healthcare team members and determine the value they place on IPE. To achieve a high level of information power a constant comparison technique was utilised during the inductive thematic data analysis process (see section 4.3.13.2)(King and Horrocks, 2010a) which enabled continuous reflection of the data so that it could be identified when high quality dialogue was being gathered, strong repetition of data and themes were occurring, there was little or no generation of new data or themes in later interviews and the aims of the study had been achieved (Bowen, 2008; Malterud et al., 2015).

#### 4.4.4. Arranging the interviews

The scheduling of interviews was undertaken to ensure that, where possible, there was a two-day interval between each interview (preferably longer) to allow for reflection on the interview schedule and refinement of questions and prompts where necessary. This helped to develop a schedule that was guided by participants' experiences rather than just based on preconceived notions, making the data more relevant and accurate (King and Horrocks, 2010a). Where this was not possible and multiple interviews had to be conducted on the same day, (i.e. when interviewing a number of participants within the same hospital) gaps of one hour between interviews were scheduled and a minimum of four days was left before conducting the next interviews to allow for reflection on the multiple interviews.

During the recruitment process all participants received an information sheet (see Appendix 4.2), a cover letter (see Appendix 4.3), and a consent form (see Appendix 4.4). On reading these documents, if the pharmacist was happy to proceed a mutually convenient time for the interview was arranged (see chapters 5 and 6 for specificities on participant recruitment).

#### 4.4.5. Participant consent

Prior to commencing the interviews, informed written consent was obtained from each participant (see Appendix 4.4). The completed consent forms confirmed the participant had read and understood the information sheet and that participation was voluntary. This also confirmed that participants were willing for interviews to be audio-recorded and that anonymised *verbatim* quotes could be used in publications.

#### 4.4.6. Interview setting

Interviews were conducted face-to-face in the pharmacists' workplace. Face-to-face interviews were chosen over telephone interviews as research by Irvine (2011) has suggested that telephone interviews are often shorter and less detailed than face-to-face interviews and can lead to a lack of rapport between interviewer and participant. Interviews were arranged to take place in a quiet space which was free from distractions to ensure that the flow of the interview was not interrupted and the recording was of a high quality (King and Horrocks, 2010a). Further details of the specific interview settings used for community and hospital pharmacists can be found in chapters 5 and 6.

#### 4.4.7. Interview schedule for data collection

The interview schedule was developed to explore the nature of pharmacists' IPIs and the value they place on IPE, and specifically used findings from the questionnaire phase of the study, the limited research related to pharmacist interactions within the literature and personal background knowledge within the area of pharmacy to achieve this (see section 4.3.3). In addition, by undertaking iterative reflection on the schedule after each interview, these factors helped to create a schedule that was predominantly guided by participants' experiences, making the data more relevant and accurate (King and Horrocks, 2010a).

A semi-structured interview schedule (see Appendix 4.5) was used to guide the interviews, enabling a range of topics to be covered whilst having the flexibility to explore other areas of interest where applicable (Kvale, 2007; King and Horrocks, 2010a). Before commencing the interviews the interview structure (including key interview topics) was described to participants to help aid their understanding and make them feel more comfortable with the interview process (Kvale, 2007). This briefing included a description of the interview schedule which was split into four areas; section A - brief pharmacist information and opening questions, section B - reflective card exercise, section C - interprofessional experiences with HCPs, section D - Closing questions.

The first part of the interview, section A, asked the pharmacists' about their previous and current practice experience in order to contextualise participants' responses during analysis (Patton, 1990). This section also comprised a set of brief questions designed to 'ease' the participant into the interview (Kvale, 2007) and to ensure the participant had a basic level of understanding of IPIs.

Following these short questions, section B contained a reflective 'ranking exercise' that was used to help the participant to reflect upon their own interprofessional practice within their current role and help immerse the participant in the interview. In this exercise, cards labelled with relevant healthcare professionals identified from the NHS careers website (NHS Health Education England, 2015) were given to the participant and they were asked to rank their perceived level of interaction with these HCPs from 'most frequent' to the 'least frequent'. Any professions that participants felt they didn't interact with could be removed from the ranking exercise. As the aim of the interviews was to explore pharmacists' IPIs, other 'non-professional' team members such as those based within the pharmacy (e.g. dispensers) and GP staff (e.g. receptionists) were not directly explored during the interviews, however participants were free to discuss these if and when relevant.

Following this ranking exercise, section C explored interprofessional experiences with the three professions pharmacists in general interact with most frequently as identified during the questionnaire phase of the study (this differed dependent on community/hospital setting – see chapters 5 and 6). In addition, if the interviewees identified other HCPs with which they personally interacted more frequently than the top three HCPs identified from the questionnaire data then these were also explored. Here a variety of questions were asked to elucidate their personal interprofessional experiences within the pharmacy they are currently working in including the method of communication (face-to-face, by phone, email etc.), the focus and content of the interaction and any facilitators and barriers to their IPIs. Participants were also given the opportunity to discuss any other professions they felt were relevant.

The final part of the interview, section D, included more general questions surrounding interprofessional working. This included determining the participant's experience of interprofessional education, what IPE, if any, the participant felt would be beneficial to support their practice, and their thoughts on the frequency of their own interprofessional working (i.e. whether more/less would be desired).

During the interview where participants gave incomplete explanations or further elaboration was needed the interviewer would use probes to elicit more complete statements (Babbie, 2015d).

The interviews were expected to last around 20 minutes in order to cover the topics required whilst also recognising the demands on the interviewees' time in their work environment (Babbie, 2015d) (time was estimated based on pilot interviews, see section 4.3.10). However, this timeframe was flexible enabling participants to continue beyond this estimated time if they so wished.

#### **4.4.8. Pilot interviews**

Once the interview schedule was designed (see section 4.3.9) three pilot interviews were completed in order to refine the interview schedule and ensure content validity (Turner III, 2010). These pilot interviews were undertaken with practising pharmacists who provided valuable verbal feedback on both the structure of and questions within the interviews (Turner III, 2010). The pilot interviews helped identify flaws, limitations, omissions and any other 'weaknesses' within the interview design and afforded the opportunity to make

specific changes to the order of questions (so that the interview 'flowed' and was not disjointed) and wording (so that they were open and not leading) prior to commencing the study as well as identifying certain prompts which elucidated valuable and relevant information (Kvale, 2007). The pilot also helped identify the estimated duration of interviews, which led to the interview schedule becoming more focused as unnecessary questions could be cut so meaningful data could be gathered without rushing through interviews. Furthermore, conducting these pilots also helped familiarise the interviewer with the interview schedule which helped the interview flow more freely which helps make the participant feel more comfortable (Babbie, 2015d). Pilot interviews were recorded but were not included in the final data analysis as they were specifically used to develop the interview schedule and interviewer rather than gather data.

#### **4.4.9. Interview completion**

Interviews were audio recorded using a Phillips Digital Pocket Memo device and data files were stored on a password encoded laptop until transcription was complete. When conducting the interviews the interviewer was dressed similarly to the pharmacists (smart work clothing) to make both participant and interviewer feel more at ease during the interview whilst still retaining the respect of the participant (Babbie, 2015d).

#### **4.4.10. Interview transcription**

Interview recordings were transcribed *ad verbatim* from Phillips SpeechExec Version 1.1 into MS Word. It was essential that responses were transcribed exactly as given in order to ensure coding was accurate and representative of the answers provided by the participant (which included the use of pauses and the use of field notes where relevant for contextualisation) therefore each transcription was checked for accuracy by listening to the recording while reading through the transcript (Babbie, 2015a).

Where possible, full *verbatim* transcriptions were completed and shared with the research team before beginning the next interview. This allowed for continuous reflection on the interview schedule, making the interview process more iterative and allowing alterations where applicable such as the addition of further questions and prompts related to areas of particular interest (King and Horrocks, 2010a).

#### **4.4.11. Data Analysis**

There are a number of methods that can be used to analyse qualitative data. In this study, the most applicable method was thematic analysis, which was conducted iteratively

throughout. Here two separate techniques were used to identify themes or patterns within the data; the theoretical or deductive 'top down' approach and the inductive 'bottom up' approach (Braun and Clarke, 2006). The deductive thematic approach was conducted first to identify specific, preconceived areas of interest. This was followed by inductive thematic analysis to determine any other themes discussed throughout the interviews. Both thematic analysis approaches were done manually by the PhD researcher (by printing codes, no software was used).

#### **4.4.11.1. Deductive thematic analysis**

Deductive thematic analysis is driven by the researcher's preconceptions allowing detailed analysis of certain specific areas of interest (Braun and Clarke, 2006). Here, data was identified based on areas of interest such as the nature and content of IPIs, the method of interaction (e.g. face-to-face/over the phone) and the frequency of interaction. After familiarisation with the transcripts, each transcription was deductively analysed to determine participant responses to four main themes; (i) the number of times each healthcare profession(al) was mentioned, (ii) the frequency of interaction with each HCP, (iii) the reasons for HCP interactions, (iv) the method of communication. Here each transcript was manually read through to identify participants responses for each of the four themes. Analysis of data outside of these four themes was conducted via inductive thematic analysis.

#### **4.4.11.2. Inductive thematic analysis**

As the deductive approach limits analysis to areas of preconceived interest, inductive thematic analysis was used to generate themes that were strongly linked to the data (Patton, 1990). Here, the coding of data was driven by the data itself enabling the development of data-specific themes (Braun and Clarke, 2006). However, as described in section 4.3.2 and 4.3.3 it must be recognised that although this analysis was data driven, it is challenging to completely divorce oneself from previous preconceptions, theoretical and epistemological views. Therefore, even with measures taken to minimise the possibility of bias, some subconscious analytical bias may have taken place (Braun and Clarke, 2006).

When completing the inductive thematic analysis the King and Horrocks (2010b) three stage approach was adopted: (i) descriptive coding (descriptive codes were written on each transcript and then reviewed when typing into a MS Word document), (ii) interpretive coding (the codes were printed and physically grouped into relevant sub-themes), (iii) overarching themes (the sub-themes were then further grouped to identify key themes by

physically moving the printed codes/sub-themes whilst ensuring the original meaning was not lost, spider diagrams were created to show how sub-themes were linked or not). See **Table 4.1** for a more detailed description of the steps used within this approach. This process was augmented by the systematic use of constant comparison which compared the identified codes and categories with the rest of the data to establish more inclusive themes that directly reflected as many data nuances as possible (Pope et al., 2000). Although all thematic analysis was conducted by the PhD researcher the themes and sub-themes were reviewed by the supervisory team to ensure clarity.

**Table 4.1.** Description of the three stage King and Horrocks (2010b) inductive thematic analysis approach used for interview analysis

<b>Stage one</b> Descriptive coding	This stage began with reading through the transcripts produced (see 4.2.10) and data familiarisation. Relevant material which helped understand the participants views, experiences and perceptions were highlighted and brief notes were made that summarised these views. These brief notes were then reviewed and descriptive codes were created, ensuring they accurately represented the initial statement. This process was then repeated for all transcripts.
<b>Stage two</b> Interpretive coding	This stage helps interpret the data as a whole. Here the descriptive codes were grouped together where common meaning is shared and given an interpretive code or 'sub-theme'. It was important that the transcripts were constantly referred back to in order to retain the context for each code and ensure the interviewer's overall interpretation was correct. This process is known as respondent validation and was employed throughout the stages of the analysis to help reduce the likelihood of interpretation errors occurring (Mays and Pope, 2000).
<b>Stage three</b> Overarching themes	This was the final step which helped identify the overarching themes that characterise the key concepts drawn from the interviews. Although the stages one and two were driven by the data alone, this stage can draw directly on theoretical or practical stances which underline the study, as long as they were supported by the data (King and Horrocks, 2010b). Here spider diagrams were used to help understand the overall nature of the data and how the sub-themes and themes interlinked.

**Chapter 5 – Which healthcare professionals do community  
pharmacists work with?**

## 5.1. Introduction

Community pharmacies represent a significant part of the primary care service within the UK, with NHS England (2013) reporting that 438 million visits are made to community pharmacies every year for health related problems; this is more visits compared to any other healthcare provider. Pharmacists are the third largest healthcare professional workforce in the UK, behind doctors and nurses, and community pharmacy (alongside hospital pharmacy) is the most common setting in which pharmacists practise (General Pharmaceutical Council, 2018d).

Community pharmacists are commonly viewed as ‘generalists’ as they provide broad ranging pharmaceutical care. There are a number of definitions of pharmaceutical care but for the purposes here, can be defined as the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient’s quality of life on a daily basis, in those with a variety medical conditions (Wilson and Barber, 2013). In order to achieve this, there is a requirement for cooperation with the patient and HCPs, in designing, implementing and monitoring a therapeutic plan that will produce therapeutic outcomes for the patient and enables pharmacists to effectively manage long-term conditions (Wilson and Barber, 2013). In addition, a major element of the community pharmacist’s role has been the management of patients presenting in the pharmacy with care needs and the subsequent management of minor conditions that can be treated ‘over-the-counter’.

It has been acknowledged that community pharmacists represent an underutilised healthcare resource (Mossialos et al., 2015; Primary Care Workforce Commission, 2015; Royal Pharmaceutical Society Wales, 2015). Primary care faces unprecedented challenges largely as a consequence of a growing population of older adults and constraints in the secondary care setting (British Medical Association, 2014). The expanded use of community pharmacists to support the delivery of primary care services is seen as one mechanism to ameliorate such issues (Royal Pharmaceutical Society, 2016). Community pharmacists have extensive pharmaceutical and health related knowledge and are ideally located to offer ready access to patients. For example, a higher proportion of the population of England live within a 20 minute walk of a community pharmacy (89.2%) compared with a GP practice (84.8%) (Todd et al., 2015). This allows for accessible and patient oriented care (Department of Health, 2013a).

The UK government has had a long-standing interest in developing and exploiting community pharmacy starting as early as 1992 when a Joint Working Party on

pharmaceutical care was established alongside the Royal Pharmaceutical Society (Noyce, 2007). However, whilst there has been a determination to utilise community pharmacy more effectively for a number of years it was not until the early 2000s when the NHS plan was published that this really gained traction. The plan specifically stated that “patients want to see all NHS staff used more effectively, with an expanded role for GPs and pharmacists” (pg. 135) (Department of Health, 2000). The plan indicated that pharmacists should be supported to provide greater clinical input into patient care through the delivery of pharmaceutical advice to both patients and other HCPs and that pharmacists should transition from the historic role of primarily dispensing prescriptions i.e. supply of medicines towards more patient facing clinical roles. However, over a decade later this ambition had not been realised as demonstrated in an observational study of community pharmacists’ roles across a working week in ten community pharmacies in London, England, in 2011 (Davies et al., 2014). Davies and colleagues found that the majority of pharmacists’ time was still spent on providing technical dispensing roles and not patient-centred care.

Subsequently a range of parties have undertaken further work to consolidate the principles articulated in the NHS plan (Welsh Assembly Government, 2011b; NHS England, 2013), in order to improve the provision of pharmaceutical care in the primary care setting, reduce NHS costs and help to secure the future of community pharmacy (Smith et al., 2013). In a ‘call to action’ for community pharmacy, NHS England (2013) recognised that community pharmacists can and do play a vital role in optimising patients’ medicines and providing an alternative care pathway to general practice, unscheduled and emergency care primarily by helping manage patients with long-term conditions and minor ailments. NHS England (2014b) vowed to support these activities through the development of electronic systems to improve pharmacists’ access to relevant and necessary patient information.

To ensure that primary care services are delivered effectively and efficiently a number of bodies, including the Department of Health, believe that fostering an environment in which pharmacists work closely with GPs and other HCPs is essential (Department of Health, 2013a; NHS England, 2014a; Bienkowska-Gibbs et al., 2015; Royal Pharmaceutical Society Wales, 2015). In addition, professional regulators including the Royal College of General Practitioners, the Royal College of Nursing and the Royal Pharmaceutical Society have directly expressed the need to develop interprofessional relationships across primary care to help optimise pharmaceutical care, reduce medication errors and improve the provision

of patient care (Centre for Workforce Intelligence, 2014; Royal College of General Practitioners, 2014; Bienkowska-Gibbs et al., 2015; Royal Pharmaceutical Society, 2016).

This drive to further integrate HCPs coincides with recent WHO programmes and inquiries within NHS trusts (see chapter 2 for more detail) that have also recommended the need for improvements in interprofessional collaboration in order to deliver more efficient, patient-centred care (World Health Organisation, 2010). Whilst some of those inquiries have primarily focused on secondary care (Andrews and Butler, 2014; Kirkup, 2015), reports such as the Mid Staffordshire review by Francis (2013) recognised the negative impact of poor communication across care sectors. Francis' review specifically highlighted that effective patient care is reliant on the timely and accurate transfer of information both from one HCP to another and from one sector to another. In practice, Francis noted that HCPs rarely sought such guidance and information from other HCPs, which potentially leads to sub-optimal clinical decisions and patient outcomes.

The Primary Care Workforce Commission (2015) also recognised and campaigned for greater use of community pharmacists. One area they particularly highlighted was the need to expand the provision of a wider range of interprofessionally integrated patient services featuring pharmacists, which they believed could ultimately reduce the strain on GPs and further integrate pharmacy into the primary care interprofessional team. The services provided through community pharmacies have expanded as a result. Beyond the Essential pharmacy services that must be provided by an NHS contracted pharmacy such as dispensing, repeat dispensing, disposal of unwanted medicines, promotion of healthy lifestyles and support for self-care (Welsh Assembly Government, 2017a), there has been the introduction of Advanced services and Enhanced services that can serve promote interprofessional integration. Advanced services are services which community pharmacies can choose to provide subject to meeting criteria; these services vary between England and Wales. The services provided in Wales include: (i) medicine use reviews (MURs) – a review of patients' medications (introduced in 2006); (ii) discharge medication reviews (DMRs) – management of medicines following the discharge of a patient from a care setting (introduced in 2011) (Hodson et al., 2014; Community Pharmacy Wales, 2017; Welsh Assembly Government, 2017a). Much like the Advanced services it is believed that the Enhanced services require community pharmacists to interact with other HCPs in order to ensure the continuity of care of patients (Primary Care Workforce Commission, 2015). Enhanced services are additional services authorised by the local Welsh health board (or clinical commissioning groups in England) in order to address the needs of the local patient

population (Welsh Assembly Government, 2017a), improve access to care and reduce the burden on other healthcare services. The Enhanced services provided in Wales, which were historically undertaken by GPs and nurses, include supervised administration of prescribed medicines, smoking cessation, syringe and needle exchange, supply of emergency hormonal contraception (EHC), travel vaccinations, blood pressure monitoring and diabetes testing, amongst others (Community Pharmacy Wales, 2017) and provide opportunities for pharmacists to expand their practice and have greater involvement within the interprofessional team.

In 2011 Van and colleagues undertook a study to investigate the nature and extent of interactions between community pharmacists and GPs, with a particular focus on the impact provision of pharmacy services had on these interactions (Van et al., 2011). The authors found that the pharmacist's role in the provision of essential services, and particularly the clinical check of prescriptions, stimulated the initiation of the majority of interactions between pharmacists and GPs. In such instances, pharmacists contacted the GP to inform them of the identified issue(s), to suggest amendments to the prescription or seek clarifications to resolve the issue(s) (Royal Pharmaceutical Society, 2017a). Interprofessional collaboration is also a key component in the provision of many advanced and enhanced services such as medicine use reviews (MURs) where correspondence with the GP is required to effectively review and manage patients' medications. However, in a systematic review into the extent of pharmacist-GP collaboration arising from medication reviews (distinct from MURs but aligned in terms of outcomes) by pharmacists, Kwint et al. (2013) concluded (from the twelve suitable randomised control trials (RCTs) included) that more intensive collaboration between pharmacists and other HCPs was required in order to achieve higher implementation rates of recommendations arising from the review of medicines. This was reinforced in a later ethnographic study into the use of MURs in UK community pharmacies by Latif and colleagues who found that there was little interaction between community pharmacists and GPs related to the MUR services. The authors concluded that until greater levels of interprofessional collaboration are realised, extended pharmacy services are unlikely to reach their full potential (Latif et al., 2013a; Latif et al., 2013b).

The desire for community pharmacy to integrate as part of interprofessional teams stretches beyond primary care; there is some evidence, for example in case studies and research articles summarised by Ham et al. (2010), to suggest that greater interprofessional working across primary and secondary care boundaries will provide more timely and

accurate information transfer and thus reduce hospital (re)admissions. Efforts have been made to bridge the divide at least in terms of transfer of pharmaceutical care through the introduction of the discharge medicines reviews (DMR) service in Wales. The DMR service, operated by community pharmacists, aims to ensure that changes made to medicines in secondary care are continued when the patient returns to primary care and ensures patients or their carers understand such changes and how to effectively manage their medicines. The service in and of itself facilitates community pharmacists to undertake interprofessional interactions across sectors and with a range of HCPs (Community Pharmacy Wales, 2017).

The shift in role of the community pharmacist is not unique to the UK. In Canada for example, Schindel et al. (2017) used a mixed method approach to survey (n=416) and interview (n=75) Canadian community and hospital pharmacists about their perceived roles and identified that many pharmacists have accepted and do provide a greater level of patient-centered care, however there were some inconsistencies with respect to their own definition of their roles and responsibilities, with some participants reluctant to relinquish drug distribution roles and take up newer more patient-centred responsibilities. They also demonstrated that study participants generally believed that “collaboration and relationships with other healthcare professionals were essential” (pg. 148) for the provision of effective patient care. Pharmacists’ views on their role was similarly investigated by Elvey et al. (2013) who conducted interviews with 43 UK pharmacists and found nine distinct professional identities of pharmacists “reflecting some degree of role ambiguity and lack of clear direction and ownership of what makes pharmacists unique” (pg. 322). Indeed, in a practice review article that focused on barriers to change within the pharmacy profession, Rosenthal et al. (2010a) highlighted that historical cultural aspects and a personality ‘type’ of pharmacists characterised by a lack of confidence, fear of new responsibility, paralysis in the face of ambiguity, need for approval and risk aversion, continue to be barriers which must be overcome in order for the profession to properly realise its potential in the provision of effective patient-centred care. They also recognised that pharmacists’ perceptions and articulation of their own roles and responsibilities varies, therefore making it challenging in delivering a coherent message of the role of the pharmacist to other HCPs. The Royal Pharmaceutical Society (2017b) has indicated that a failure to articulate a coherent definition of the role of the pharmacist and indeed the wider pharmacy team has the potential to negatively impact interprofessional integration in practice.

Despite a variety of government and regulatory agencies indicating the underutilisation of community pharmacists and a drive for pharmacists to deliver greater interprofessional working (Department of Health, 2010; Royal Pharmaceutical Society and Royal College of General Practitioners, 2011; Centre for Workforce Intelligence, 2014; Primary Care Workforce Commission, 2015), within the literature there is only a limited sense of the current state of community pharmacists' IPIs. A number of studies have explored community pharmacists' interactions with general practitioners (GPs) through a variety of quantitative and qualitative methods (see section 5.4 for further discussion) (Norton et al., 2003; Dobson et al., 2006; Liu et al., 2010; Snyder et al., 2010; Bradley, 2012; Bardet et al., 2015). However, beyond engagement with GPs, little is known about the types of professionals that community pharmacists interact with, the frequency, mode, content or reason for interactions or any barriers and facilitators which may impact IPIs. This limited knowledge of the IPIs occurring in practice means that understanding community pharmacists' current role within the interprofessional team is a challenge. This makes it difficult to determine areas of practice where development or improvements may be needed in order to deliver interprofessional, patient-centred care in the primary and community care settings. Furthermore, with community pharmacists' IPIs generally unknown, this makes it challenging for educators to design meaningful and contemporary interprofessional education which prepares students for current practice (Barr et al., 2017).

This mixed method study therefore aims to explore the interprofessional interactions that take place between community pharmacists and other HCPs during their current scope of practice and to explore pharmacists' views on the value of IPE. The approach adopted was in two stages: (i) a self-complete questionnaire was administered to all community pharmacies in Wales to determine pharmacists' reported frequency of interaction with HCTMs; (ii) this quantitative approach was subsequently followed by a series of face-to-face semi-structured interviews with a number of community pharmacists based in Wales to explore the nature of interprofessional interactions and determine their previous exposure to IPE and the value they place on IPE.

These two sequential elements aimed to identify and/or explore community pharmacists' (based within Wales) perceived views in a number of areas including:

1. Community pharmacists' perceived frequency of interactions with other HCTMs
2. Community pharmacists' perceived topic of interprofessional interactions with other HCPs

3. The mode through which community pharmacists perceived their interprofessional interactions with other HCPs took place (e.g. by telephone, face-to-face)
4. The perceived facilitators and barriers to community pharmacists interprofessional interactions with other HCPs
5. The perceived value community pharmacists place on IPE
6. Community pharmacist's opinions on the design and implementation of relevant and meaningful undergraduate/postgraduate pharmacy related IPE.

## 5.2. Methods

In order to pragmatically and thoroughly address the research aims, to determine and explore community pharmacists' interprofessional interactions (IPIs) and the value they place on IPE, the use of mixed methods was chosen as this attracts benefits from both quantitative and qualitative methodological approaches (Johnson and Onwuegbuzie, 2004). The study was conducted in two parts:

**Stage one – Questionnaire:** The first stage of this study sought to quantify the reported frequency of interactions between community pharmacists and other healthcare team members (HCTMs) using a self-complete questionnaire which was administered to all community pharmacies in Wales.

**Stage two – Semi-structured interviews:** Informed by results from stage one, semi-structured interviews were conducted with community pharmacists to elucidate the nature of the IPIs in which they engage and to determine the perceived value of IPE.

A broad overview of the methods employed is described in chapter 4 - General Methods. The following section however provides specific detail on the methods employed here.

### 5.2.1. Stage one – Questionnaire determining community pharmacists’ frequency of interaction with other healthcare professionals and wider team members

This section describes the specific methods for the design, recruitment and dissemination of a questionnaire to community pharmacies in Wales which sought to determine the frequency of interaction between community pharmacists and other HCTMs (comprising of HCPs and other staff within the healthcare team).

#### 5.2.1.1. Questionnaire design

A questionnaire was developed to determine community pharmacists’ reported frequency of interactions with other HCTMs. The questionnaire consisted of three sections (see Appendix E). Section A was designed to determine demographic information associated with the respondent pharmacist in terms of the nature of their role and the characteristics of the community pharmacy in which they practise. In section B, respondents were asked to indicate their reported frequency of “direct personal interaction” with each of 26 HCTMs using a 6-point ordinal scale (at least once a day, at least once a week, at least once a month, at least once a year, less frequently, never). The list of the 26 HCTMs in the questionnaire was adapted from the NHS careers website (NHS Health Education England, 2015) and can be seen in **Table 5.1**. A free text box was also provided in section B where respondents could list any ‘other’ professionals they interact with beyond those listed. Section C allowed respondents the opportunity to provide any comments relating to their IPIs.

**Table 5.1.** List of the 26 HCTMs, identified from the NHS careers website, included in section B of the questionnaire, categorised according to their sector of practice

Primary care HCTMs based in GP practice		
General practitioner (GP)	GP practice manager	GP receptionist
Health visitor	Midwife <sup>^</sup>	Nurse - Community
Pharmacist - Primary care		
Primary care HCTMs based outside the GP practice		
Care home staff	Dentist	Optician
Vet		
Secondary care HCTMs		
Dietician <sup>^^</sup>	Doctor - Hospital	Nurse - Hospital
Occupational therapist <sup>^^</sup>	Paramedic <sup>^^</sup>	Pharmacist – Hospital
Physiotherapist <sup>^^</sup>	Podiatrist <sup>^^</sup>	Radiographer <sup>^^</sup>
Social worker <sup>^^</sup>	Speech and language therapist <sup>^^</sup>	
Community Pharmacy HCTMs		
Accredited checking technician <sup>^</sup>	Dispenser/Technician <sup>^</sup>	Medicines counter assistant
Pre-registration Pharmacist <sup>^</sup>		

<sup>^</sup> = HCTMs who can also have a role in secondary care

<sup>^^</sup> = HCTMs who can also have a role in primary care

### **5.2.1.2. Sampling and dissemination**

To ensure that data was representative of the community pharmacist population within Wales, purposive sampling (Babbie, 2015d) of all 716 community pharmacies across the country (Welsh Assembly Government, 2017a) was undertaken. A list of community pharmacies in Wales was obtained from Community Pharmacy Wales (2015). Questionnaires were mailed to community pharmacies rather than directly to community pharmacists. This was partly because a mailing list of all pharmacists was not available but also so that the impact that the community pharmacy itself (including its location and the provision of services from the pharmacy) had on the frequency of interprofessional interactions could be determined.

Pharmacies were sent a mailing 'package' directly addressed to 'the pharmacist' that comprised the questionnaire (see Appendix E), a cover letter (see Appendix F) and a free-post return envelope. The cover letter indicated that respondents needed to be a qualified pharmacist who worked within that specific pharmacy for a minimum of two days a week to ensure they had a good understanding of the interprofessional interactions that are characteristic of the community pharmacy in which they practise. If more than one pharmacist fit the criteria at the pharmacy just one pharmacist was required to complete and return the questionnaire.

Dissemination of the questionnaire to each community pharmacy was by 2<sup>nd</sup> class post mailed on Friday 6<sup>th</sup> February 2015. Questionnaires were uniquely coded in order to determine the pharmacies from which a returned questionnaire had been received. A duplicate reminder mailing 'package' was sent to non-respondents three weeks after the initial mailing. All questionnaires returned by 20<sup>th</sup> March 2015 were considered for analysis representing a 6-week data collection period. On the small number of occasions where multiple responses were received from the same pharmacy (i.e. return of both the first and second questionnaire following dissemination of the 'reminder package'), the questionnaire received from the first mailing was used alone in data analysis.

### **5.2.2. Stage two – Semi-structured interviews exploring the nature of interprofessional interactions between community pharmacists and healthcare professionals**

Following the questionnaire element of the study which identified the frequency of interaction between community pharmacists and other healthcare professionals and team

members, a qualitative approach was employed to explore the nature of these interactions, specifically the HCPs community pharmacists interacted most frequently with. This was achieved through face-to-face semi-structured interviews with community pharmacists from a variety of backgrounds. The interviews focused on a number of broad topic areas including: (i) identifying the HCP which they interact with most frequently; (ii) the mode by which their interprofessional interactions take place; (iii) the content of their interprofessional interactions; (iv) barriers and facilitators to interprofessional interactions; (v) the participants' views on IPE. This section describes the specific nuances for conducting these interviews, however a broad overview of the methods used for these interviews can be found in chapter 4.

### **5.2.2.1 Participant recruitment**

Purposive, snowball sampling was used to recruit pharmacists with a range of experiences and demographic characteristics across Wales. Recruitment continued until the sample size was sufficiently large and varied to ensure data encompassed views across the community pharmacy sector and constant comparison methodology identified strong repetition of data and themes and study aims had been achieved (Bowen, 2008; Malterud et al., 2015) (see chapter 4).

The data gathered from stage one of this study (the questionnaire) informed the design of the interview schedule and the recruitment process to ensure that data gathered was meaningful and more representative of the overall community pharmacist population in Wales (Creswell and Creswell, 2017). A number of considerations were therefore made when recruiting potential participants to ensure the population sample covered a broad range of demographics. The initial recruitment phase aimed to identify a number of pharmacies which varied with; (i) health board; (ii) their co-location with other healthcare service providers, (iii) their location (City/Town High Street, Rural/Village, etc.), (iv) the size of the pharmacy company (independent vs multiple pharmacies). Once suitable pharmacies were identified, recruitment emails were sent addressed to the pharmacist. This recruitment email provided details about the interviews and specified that in order to participate pharmacists must work regularly (at least two days a week) within the addressed pharmacy. Those pharmacists who fulfilled this requirement and were willing to take part were encouraged to reply by email or phone directly the research team. Upon receipt of an expression of interest from a pharmacist they were sent (by email) further detail about the interviews in the form of a cover letter (see Appendix G), information sheet (Appendix H) and consent form (see Appendix I). After reading this information

pharmacists who then consented to take part in the interviews were contacted by telephone and a mutually convenient time to conduct the interview was arranged. Written completion of the consent form was obtained from the participant on the day of the interview.

At the end of each interview, participants were asked if they could recommend possible interviewees who fulfilled other desired demographic criteria to broaden the population (purposive, snowball sampling).

### **5.2.2.2. Interview setting**

Interviews were conducted face-to-face in the participant's workplace. As all participants were practising community pharmacists, the interviews were conducted in the community pharmacy in which they were employed. The participant was asked to provide a quiet space for the interviews to ensure the interview was free from distractions and the recording was of a high quality (King and Horrocks, 2010a). In all cases, the interviews took place in the consultation room. As the interviews were specifically related to the participant's experiences in that pharmacy, this setting may have also been beneficial in aiding the participant's recall of interactions (Coughlin, 1990).

### **5.2.2.3. Data Collection**

The interview schedule (see Appendix K) was developed based on: (i) data gathered in stage one of this study; (ii) existing literature on pharmacist interactions with other healthcare practitioners and (iii) the personal knowledge of the researcher within the field of pharmacy. The interview schedule was separated into four parts (sections A to D) as described in chapter 4. In the first part of the schedule, section A, participants were asked about their current and previous experience of pharmacy practice. The questions were brief and aimed to ease the participant into the interview (Kvale, 2007). Section B comprised a reflective 'ranking exercise' that was used to help the participant to reflect upon their own interprofessional practice within their current role and help immerse the participant in the interview. In this exercise participants were asked to rank cards labelled with seventeen relevant HCPs (see **Table 5.2**) based on their reported level of interaction with these HCPs. The members of the wider healthcare team such as pharmacy dispensers, GP receptionists and other pharmacists were excluded from this exercise (see chapter 4 for an explanation).

In the third part of the interview, section C of the schedule, participants were asked about their interactions with the GP, community nurse and dentist i.e. the three professions

identified in stage one of the study as those with which respondent pharmacists indicated they interacted with most frequently (see section 5.3.1). In addition, if during the ranking exercise any participant indicated that one or more of their top three interactions was with a different HCP from these, the interactions with the additional HCPs was also explored. The final part to the interview, section D, included general questions about interprofessional working and the participant's past experiences of IPE.

**Table 5.2.** List of the 17 HCPs identified from the NHS website used during the interview frequency of interaction

Dentist	Nurse - Community	Podiatrist
Dietician	Nurse - Hospital	Radiographer
Doctor - Hospital	Occupational therapist	Social worker
General practitioner (GP)	Optician	Speech and language therapist
Health visitor	Paramedic	Vet
Midwife	Physiotherapist	

In this part of the study, the analysis represents a secondary analysis of data that was obtained by a final year pharmacy student as part of their MPharm research project. This was done in order to enable the student to gain experience in undertaking research as well as to aid the time consuming data collection process. Whilst all aspects of the study including development of the interview schedule, recruitment of participants and thematic data analysis were conducted by the PhD researcher, the interviews themselves were practically prosecuted by the pharmacy student who was provided with training in interview methodology and conducted three pilot interviews under the observation of the researcher. This allowed feedback from the researcher to improve interview delivery (Babbie, 2015d). All interviews were transcribed *ad verbatim* by the student but were reviewed by the researcher to ensure final transcripts were accurate and representative (Babbie, 2015a). Interviews were conducted with an interval of at least two days to enable transcriptions to be completed allowing for reflection to take place in order to iteratively finesse the interviews through alterations of or additions to the interview schedule (King and Horrocks, 2010a).

### 5.3. Results

As with study methods (see section 5.2), the results have been separated into the two research stages: (i) **stage one - questionnaire**; (ii) **stage two - semi-structured interviews**.

#### 5.3.1. Stage one – Questionnaire determining community pharmacists' frequency of interaction with other healthcare professionals and wider team members

In this study, purposive sampling was used to determine the frequency of interactions between community pharmacists and other HCTMs (comprising of HCPs and other staff within the healthcare team) from a cross section of community pharmacists regularly practicing in Wales. To achieve this a questionnaire was disseminated to all 716 community pharmacies in Wales.

##### 5.3.1.1. Response rate

Of the 716 pharmacies mailed, 443 questionnaires were returned from the two mailings, an initial mailing and a reminder, providing an overall response rate of 61.9%; the response rate after the first mailing was 40.2%.

##### 5.3.1.2. Respondent demographics

Section A of the questionnaire was concerned with collecting demographic data related to the responding pharmacist and the community pharmacy in which they practise. The questionnaire featured eight areas related to the participants' demographics: (i) the health board the pharmacy belonged to; (ii) the respondent's role within the pharmacy; (iii) the number of GP practices the pharmacy serves; (iv) the number of additional staff working within the pharmacy dispensary; (v) the size of the community pharmacy company; (vi) the locality of the pharmacy; (vii) whether the pharmacy is co-located with another healthcare provider and (viii) the services provided out of the pharmacy. Of the 443 respondents 438 completed all eight questions in section A.

##### 5.3.1.2.1. Spread of respondents across Local Health Boards

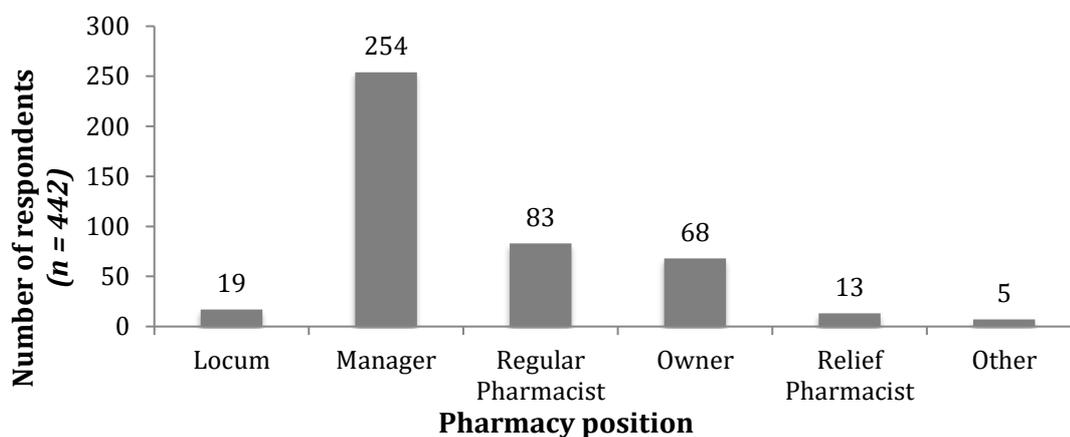
Each respondent was asked to indicate which Local Health Board (LHB) the pharmacy they work in is associated. **Table 5.3** shows the distribution of respondents across the seven Welsh LHBs. Whilst the number of pharmacies in each LHB varies significantly (range 23 – 155) the percentage response within these LHBs remained consistent (mean 61.9% ± 4.9).

**Table 5.3.** Distribution of community pharmacist respondents (n=443) across all seven Welsh Local Health Boards (LHBs)

Local Health Board (LHB)	Number of respondents (n=443)	Percentage of total respondents (%)	Number of pharmacies in each LHB (n=716)	Response rate within LHB (%)
Abertawe Bro Morgannwg	75	16.9	125	60.0
Aneurin Bevan	77	17.4	130	59.2
Betsi Cadwaladr	107	24.2	155	69.0
Cardiff & Vale	70	15.8	107	65.4
Cwm Taf	44	9.9	77	57.1
Hywel Dda	55	12.4	99	55.6
Powys	15	3.4	23	65.2

### 5.3.1.2.2. Respondents' role within the community pharmacy

Pharmacists were asked to specify their role within the pharmacy; just one respondent did not complete this (n=442). **Figure 5.1** shows that more than half of the respondents were managers (57.5%), with over a third either owning the pharmacy or classing themselves as the 'regular pharmacist' (but not owner or manager). Just 32/442 were relief or locum pharmacists. The 'other' category (n=5) included three pre-registration pharmacists, one superintendent pharmacist and one stated other but did not specify their role; all respondents were included in the frequency of interaction data analysis (see section 5.2.2.3).

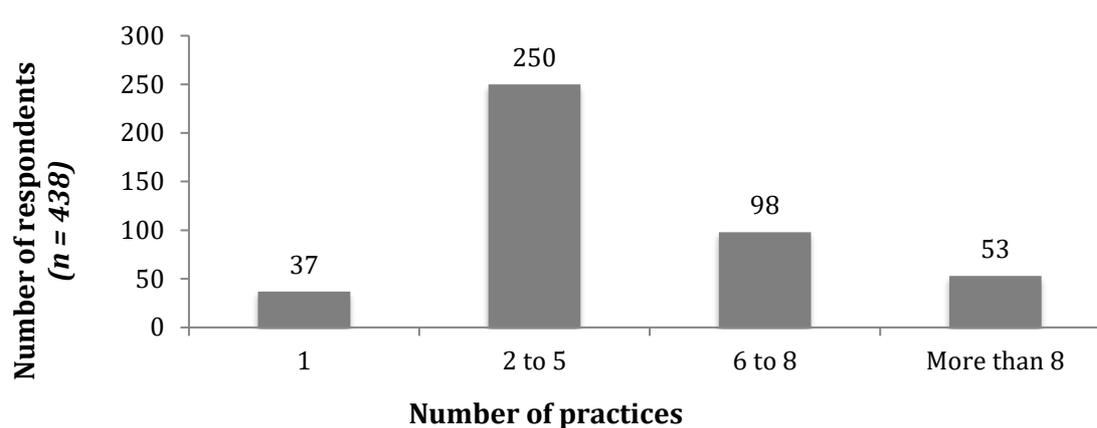


**Figure 5.1.** Role of the respondents (n=442) in the community pharmacy

### 5.3.1.2.3. Number of GP practices community pharmacists perceived the pharmacy regularly serviced

Respondents were asked to indicate the number of GP practices they perceived/understood the pharmacy regularly serviced; data was categorised into four bands. **Figure 5.2** indicates

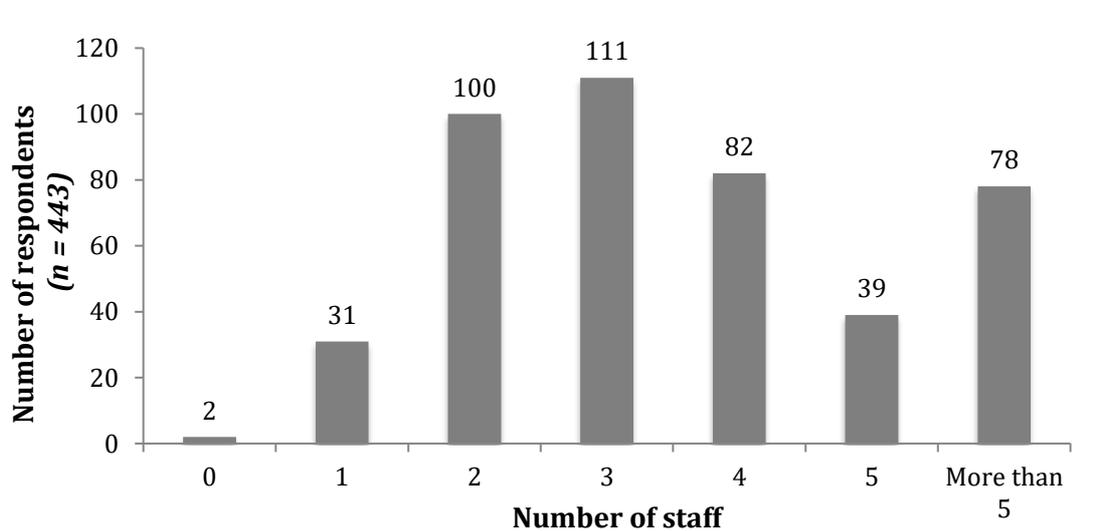
that over half of the pharmacies (56.9%) regularly served between 2 and 5 GP practices.



**Figure 5.2.** Number of GP practices community pharmacists (n=438) perceived their pharmacy regularly serviced in a typical week

#### 5.3.1.2.4. Number of additional staff working in the pharmacy

Respondents were asked to indicate how many staff work in the pharmacy's dispensary on a daily basis to help understand the respondent's working environment. The number of staff reported to work in the dispensary was highly variable (see **Figure 5.3**), however the mode value was three additional pharmacy staff (n=111). Of note, two pharmacies reported they had no dispensary staff except for the pharmacist and 78 respondents indicated they worked with more than five members of staff.



**Figure 5.3.** The number of additional staff regularly working alongside the community pharmacist (n=443) in the dispensary

#### 5.3.1.2.5. Size of the company in which the respondent practised

Respondents were asked to indicate the number of pharmacies operated by the parent company or organisation for which they worked. Data was categorised into 'independent'

pharmacies ( $\leq 6$  pharmacies within the company) and 'multiple' pharmacies ( $\geq 7$  pharmacies within the company); these categories reflect those used by Welsh Assembly Government (2017a). The majority (68.5%,  $n=302$ ) of respondents indicated they worked in pharmacies categorised as 'multiple' pharmacies compared to 139 (31.5%) in independent pharmacies (total of 441 respondents completed this question).

### 5.3.1.2.6. Locality of the community pharmacy

Respondents were asked to indicate the locality of the pharmacy by selecting one of the five predefined options (refined during piloting) or by indicating an 'other' locality. **Figure 5.4** shows the distribution of the 441 respondents (2/443 missing) across localities. The majority of pharmacies (92.1%) were described as being located either on high streets or residential suburbs in towns or cities, or in rural areas or villages. Just 21/441 respondents indicated their pharmacy was in an out-of-town supermarket or retail park. Fourteen respondents stated the pharmacy was in a different ('other') locality; six of which were based within a 'medical centre', three in a GP practice and five who did not identify the locality of their pharmacy.



**Figure 5.4.** The locality of each respondents' community pharmacy ( $n=441$ )

### 5.3.1.2.7. Co-location of the community pharmacy with other healthcare providers

Respondents were asked to indicate if the pharmacy was directly attached to (physically co-located alongside) a GP practice, dental practice, opticians or any 'other' healthcare provider. The majority of respondents ( $n=342$ , 77.2%) indicated that their pharmacy was not attached to any other healthcare provider. The remaining 101 pharmacies (22.8%) stated they were attached to another healthcare provider of which fourteen were attached to multiple healthcare providers (see **Table 5.4**). The most common healthcare provider that pharmacies were co-located with was the GP practice ( $n=77$ , 76.2% of respondents

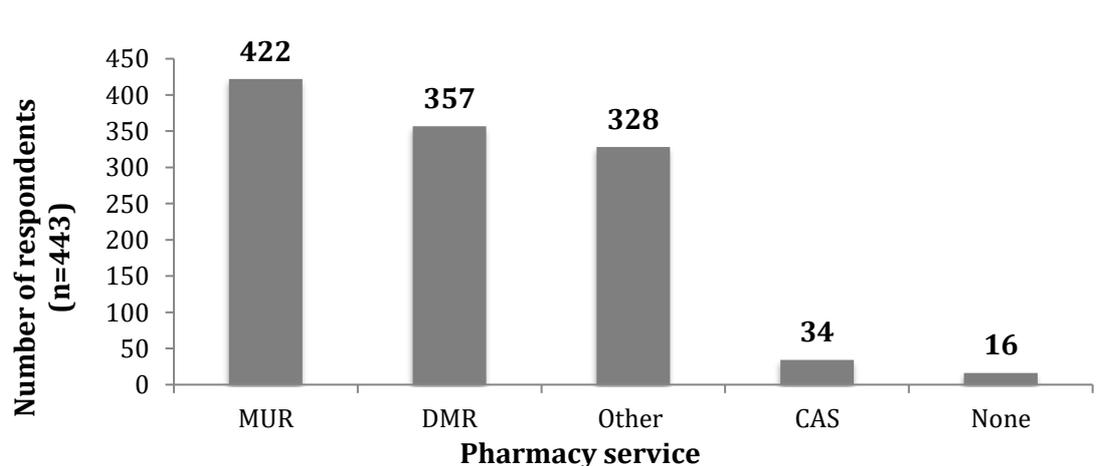
who were co-located alongside of other healthcare providers). Co-location with other providers was less common but was predominantly with opticians (n=15, 14.9%) and dental practices (n=10, 9.9%). Twenty-one respondents stated they were attached to an 'other' healthcare provider not listed (20.8%), which included podiatry clinics (n=4), community nurses (n=2) and physiotherapy services (n=1).

**Table 5.4.** Community pharmacies reporting attachment to more than one healthcare provider (n=14)

Healthcare providers the pharmacy is attached to	Frequency (n=14)
GP and other	4
GP, Dentist, Optician and other	3
GP and Optician	2
GP and Dentist	2
GP, Dentist and other	2
Optician and Dentist	1

### 5.3.1.2.8. Services provided from the pharmacy

Respondents were asked to detail the Advanced services provided by their pharmacy, results of which are shown in **Figure 5.5**. The majority of pharmacies (n=422, 95.3%) undertook MURs, of which 25 reported that this was the only Advanced service they offered. MURs and DMRs were provided more commonly than the common ailment scheme (CAS) where just 34 of 443 pharmacies (7.7%) delivered this service. Thirty-one pharmacies (6.9%) reported undertaking MUR, DMR and CAS with 28 of these also indicating that they undertook 'other' services. Of note sixteen pharmacies (3.6%) reported that they do not provide any additional services beyond those specified in the core NHS community pharmacy contract.



**Figure 5.5.** Number of community pharmacist respondents (n=443) providing MUR, DMR, CAS and 'other' additional services

The 'other' category allowed respondents to state any additional services provided that were not listed within the questionnaire. In total twenty additional services were identified across 328 respondents (74.0%), many of whom stated that they provide more than one additional service. These other services primarily described Enhanced services (see **Table 5.5**) such as emergency hormonal contraception (EHC) (n=248, 56.0% of all 443 respondents) and smoking cessation (n=161, 36.3%).

**Table 5.5.** *Enhanced services provided from community pharmacies in this study*

<b>Enhanced service</b>	<b>Number of respondents providing the service</b>	<b>Percentage of respondents (n = 443)</b>
Emergency hormonal contraception (EHC)	248	56.0%
Smoking cessation	161	36.3%
Supervised consumption	111	25.1%
Needle exchange	72	16.3%
Flu vaccine	70	15.8%
Just in case boxes	34	7.7%
MAR chart scheme	29	6.5%
<u>Two services including:</u> Blood pressure checks, Care/nursing home services	7	1.6%
Inhaler technique counselling	6	1.4%
<u>Two services including:</u> Travel health/vaccinations, Waste reduction scheme	5	1.1%
<u>Three services including:</u> Erectile dysfunction, Hair retention, Malaria prophylaxis	4	0.9%
<u>Three services including:</u> Cholesterol testing, Diabetes testing, Minor ailment scheme,	3	0.7%
<u>Two services including:</u> Meningitis vaccination, Weight management	2	0.4%

### **5.3.1.3. Community pharmacists' perceived frequency of interaction with other healthcare team members**

Section B of the questionnaire was concerned with the overall perceived frequency of interaction between the 443 responding pharmacists and healthcare professionals / team members. Findings are displayed in **Table 5.6** and **Figure 5.6** showing the percentage of responding pharmacists who indicated they work with HCTMs at least once a month and at least once a week (**Table 5.6** also shows daily interactions). Although 443 responded to the questionnaire these percentages were individually determined from the specific response rate per HCTM which varied (some individual frequency data per HCTM was missing as shown in **Table 5.6**) with a mean response rate of 439/443 received across all 26 HCTMs.

The data shows that those HCPs based within the GP practice were reported by community pharmacists to represent the most frequent perceived source of interaction, with the majority of pharmacists reporting that they interact with GPs (98.2%) and community nurses (80.0%) at least once a month. Of note, GP receptionists were identified as the member of the wider healthcare team that community pharmacists interacted with most frequently (99.8% at least once a month and 99.1% at least once a week).

In terms of daily interactions, community pharmacists indicated that they interact most frequently with those HCTMs similarly located within the community pharmacy such as dispenser/technician (D/T) (95.5% of respondents) and medicines counter/healthcare assistant (MCA) (93.9% of respondents). This high level of daily interaction was otherwise only reported with GP receptionists (90.5% of respondents), with significantly lower proportions of pharmacists interacting with HCPs on a daily basis, the highest of which was the GP (37.6% of respondents).

Outside of the GP practice and community pharmacy settings, doctors and nurses based within the hospital setting were sources of frequent interaction with pharmacists: 54.4% and 33.0% of respondents respectively reporting interactions at least once a month. However, this relatively high level of engagement was not observed for other professionals similarly located in the hospital setting. Other professions that were often represented in distinct primary care premises like community pharmacy were dentists and opticians. The data revealed that dentists ranked third overall in terms of the reported frequency of interaction with community pharmacists (42.1% of respondents at least once a month). For opticians, the interactions were reported to be less frequent (only 14.1% of respondents at least once a month).

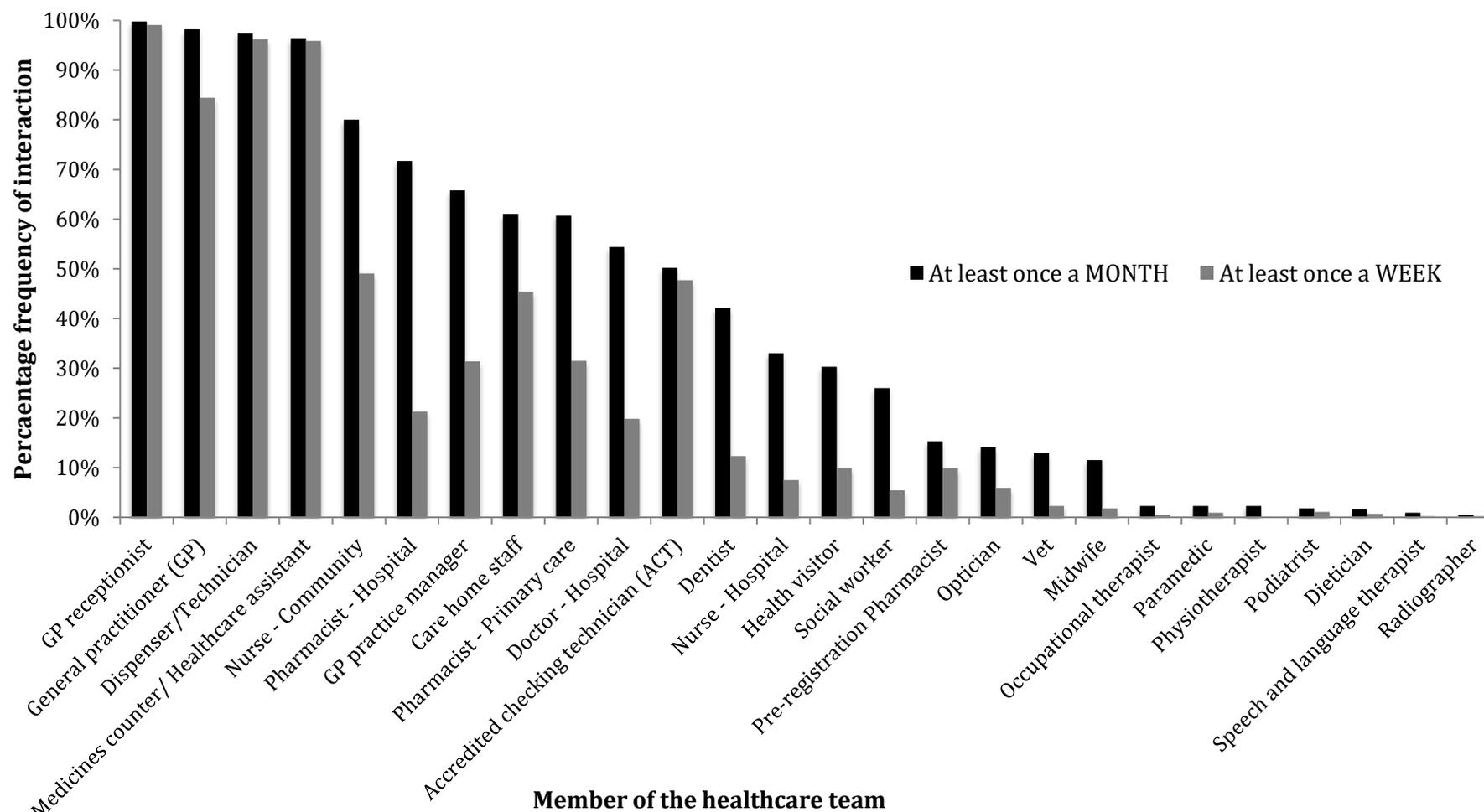
A significant proportion of respondents indicated that they frequently engage in interactions with other pharmacists. For example, 71.7% of community pharmacists reported interacting with hospital pharmacists at least once a month and 60.7% with primary care pharmacists. In addition, 61.1% of respondents interacted at least once a month with HCTMs based within care homes.

Interestingly none of the respondents reported interactions with midwives, occupational therapists, paramedics, physiotherapists, podiatrists, speech and language therapists or vets on a daily basis and none of the respondents interacted with a physiotherapist on a

weekly basis. A small number of respondents also indicated their frequency of interaction with HCTMs outside of the 26 types listed within the questionnaire through the 'other' free text box provided. These included: the drug and alcohol team (n=12); community psychiatric nurse (n=5); carers (n=5); the LHB pharmacist (n=3); other LHB team members (n=3). Interactions with these groups were described as at least once a month.

*Table 5.6. Percentage of community pharmacists reporting that they interact with each HCTM at least once a month/week/day, ordered by 'at least once a month'*

HCTM	Response rate per HCTM (max. 443)	At least once a MONTH	At least once a WEEK	At least once a DAY
GP receptionist	441	99.8%	99.1%	90.5%
General practitioner (GP)	442	98.2%	84.4%	37.6%
Dispenser/Technician (D/T)	442	97.5%	96.2%	95.5%
Medicines counter/ healthcare assistant (MCA)	441	96.4%	95.9%	93.9%
Nurse – Community	440	80.0%	49.1%	10.9%
Pharmacist – Hospital	442	71.7%	21.3%	1.6%
GP practice manager	442	65.8%	31.4%	9.1%
Care home staff	432	61.1%	45.4%	17.1%
Pharmacist – Primary care	438	60.7%	31.5%	7.1%
Doctor – Hospital	434	54.4%	19.8%	4.2%
Accredited checking technician (ACT)	432	50.2%	47.7%	39.4%
Dentist	439	42.1%	12.3%	11.2%
Nurse – Hospital	439	33.0%	7.5%	0.9%
Health visitor	439	30.3%	9.8%	1.6%
Social worker	442	26.0%	5.4%	0.7%
Pre-registration Pharmacist	443	15.3%	9.9%	8.8%
Optician	440	14.1%	5.9%	0.9%
Vet	443	12.9%	2.3%	0.0%
Midwife	433	11.5%	1.8%	0.0%
Occupational therapist	441	2.3%	0.5%	0.0%
Paramedic	442	2.3%	0.9%	0.0%
Physiotherapist	438	2.3%	0.0%	0.0%
Podiatrist	440	1.8%	1.1%	0.0%
Dietician	428	1.6%	0.7%	0.2%
Speech and language therapist	443	0.9%	0.2%	0.0%
Radiographer	441	0.5%	0.2%	0.2%



**Figure 5.6.** Percentage of community pharmacists interacting with HCTMs at least once a month or once a week, ranked in descending order by the at least once a month category

#### ***5.3.1.4. Impact of demographic characteristics on respondents' reported frequency of interactions with HCTMs***

Throughout the questionnaire, a number of demographic characteristics were captured including the size of the pharmacy company that respondents worked for, the locality of the pharmacy, whether the pharmacy was attached to other providers and the services provided from the pharmacy. In order to understand if any of these characteristics significantly impacted on the frequency of interactions with HCTMs, chi-squared statistical analyses were undertaken (significance was set at  $p < 0.05$ ).

##### **5.3.1.4.1. Impact of the size of the pharmacy company (independents vs multiple) on respondents' reported frequency of interaction with HCTMs**

The Welsh Assembly Government (2017a) defines two categories of pharmacies namely independent pharmacies (a company with 6 or fewer pharmacies) or multiple pharmacies (a company with more than 6 pharmacies). Statistical analysis comparing staffing numbers with the size of the pharmacy group (see **Table 5.7**) was conducted to determine if this reflected findings of the General Pharmaceutical Council (2018b) who found that independent pharmacies employed more staff. The analysis of the questionnaire data highlighted that there was a significant difference between pharmacy company sizes when comparing the number of staff employed. A visual comparison of this data was then conducted to understand and determine the nature of this statistical difference (i.e. identify where the difference in the data is through looking at the trends of the data side by side). This visual comparison revealed that (like the GPhC findings) multiple pharmacies were significantly more likely ( $p=0.006$ ) to employ larger numbers of dispensary staff. For example in independent pharmacies 11.5% of respondents reported there were one or less dispensary staff versus 5.6% in multiples and 12.9% of respondents from independents reported more than five dispensary staff versus 19.9% in multiples (see Table 5.7 to view the raw data and see the trends of staff employment dependent of pharmacy company size).

**Table 5.7.** A comparison of the number of dispensary staff working in independent and multiple community pharmacies. Multiple pharmacies were observed to employ significantly ( $p < 0.05$ ) more dispensary staff than independents

Number of dispensary staff	Independent pharmacies ( $\leq 6$ pharmacies) (n=139)		Multiple pharmacies ( $> 6$ pharmacies) (n=302)	
	Number of respondents	Percentage of respondents	Number of respondents	Percentage of respondents
<b>0</b>	2	1.4%	0	0.0%
<b>1</b>	14	10.1%	17	5.6%
<b>2</b>	28	20.1%	72	23.8%
<b>3</b>	33	23.7%	78	25.8%
<b>4</b>	25	18.0%	55	18.2%
<b>5</b>	19	13.7%	20	6.6%
<b>More than 5</b>	18	12.9%	60	19.9%

As significantly more staff worked within multiple pharmacies, statistical analysis was undertaken to determine if this had any impact on pharmacists' IPIs. When comparing independent and multiple pharmacies, a significant difference in the reported level of IPIs was identified for 5 of the 26 HCTMs (see **Table 5.8**). HCTMs based within the GP practice accounted for three of the five professions where statistical differences in the frequency of interactions was identified, namely community nurses, midwives and primary care pharmacists. Once again visual comparisons were conducted by the research team to assess the trends of the data to better understand the reasons why there were significant differences between these pharmacy company sizes. This process showed that pharmacists working within independent pharmacies tended to report higher levels of interaction with midwives and community nurses, however as no clear pattern emerged within the data for primary care pharmacists it was difficult to determine whether it was pharmacists working in independent or multiple groups that had more frequent interactions. The raw data can be seen in Table 5.8 in order to exemplify this visual comparison process.

**Table 5.8.** HCTMs where significant differences ( $p < 0.05$ ) in the frequency of interaction was identified when comparing community pharmacists practising in independent or multiple branch pharmacies

HCTM	Independent vs multiple pharmacy	At least once a DAY	At least once a WEEK	At least once a MONTH	At least once a YEAR	Less than once a YEAR	Never
ACT ( $p=0.005$ )	Independent ( $n=136$ )	47 34.6%	5 3.7%	2 1.5%	2 1.5%	3 2.2%	77 <b>56.6%</b>
	Multiple ( $n=294$ )	121 <b>41.2%</b>	31 <b>10.5%</b>	9 <b>3.1%</b>	9 <b>3.1%</b>	13 <b>4.4%</b>	111 37.8%
Community Nurse ( $p=0.001$ )	Independent ( $n=139$ )	18 <b>12.9%</b>	66 <b>47.5%</b>	37 26.6%	7 5.0%	3 2.2%	<b>8</b> <b>5.8%</b>
	Multiple ( $n=299$ )	30 10.0%	101 33.8%	99 <b>33.1%</b>	44 <b>14.7%</b>	18 <b>6.0%</b>	7 2.3%
Midwife ( $p=0.039$ )	Independent ( $n=134$ )	0 <sup>^</sup> 0.0%	1 <sup>^</sup> 0.7%	16 <b>11.9%</b>	38 <b>28.4%</b>	40 29.9%	39 29.1%
	Multiple ( $n=297$ )	0 <sup>^</sup> 0.0%	7 <sup>^</sup> <b>2.4%</b>	26 8.8%	51 17.2%	106 <b>35.7%</b>	107 <b>36.0%</b>
Pre-registration Pharmacist ( $p<0.001$ )	Independent ( $n=139$ )	9 6.5%	1 0.7%	2 1.4%	13 9.4%	23 16.5%	91 <b>65.5%</b>
	Multiple ( $n=302$ )	30 <b>9.9%</b>	4 <b>1.3%</b>	22 <b>7.3%</b>	52 <b>17.2%</b>	66 <b>21.9%</b>	128 42.4%
Primary care pharmacist ( $p=0.015$ )	Independent ( $n=137$ )	7 5.1%	33 24.1%	46 <b>33.6%</b>	29 <b>21.2%</b>	4 2.9%	18 <b>13.1%</b>
	Multiple ( $n=299$ )	24 <b>8.0%</b>	74 <b>24.7%</b>	81 27.1%	63 21.1%	35 <b>11.7%</b>	22 7.4%

<sup>^</sup>= Categories that were combined for each specific demographic characteristic when conducting the chi-squared analysis; **Bold percentage** = percentage of respondents that is comparatively higher when comparing interactions frequencies with each HCTM dependent on the pharmacy company size

In addition, respondents working for multiple pharmacy were found to have a significantly greater frequency of interactions with ACTs and pre-registration pharmacists compared to independent pharmacies. Significance could not be tested for the level of reported interactions with D/Ts and MCAs as the data did not fulfill chi-squared criteria, however visual comparisons suggested pharmacists based within multiple pharmacies reported higher levels of interaction with these team members (95.0% of pharmacists working in a multiple pharmacy interacted on a daily basis with MCAs and 91.3% within independent pharmacies, and 97.7% interacted daily with dispensers/technicians in multiples and 90.6% in independents).

#### 5.3.1.4.2. Impact of co-location of the pharmacy with other healthcare service providers on respondents' reported frequency of interactions with HCTMs

Some 23% ( $n=101$ ) of respondents reported that the pharmacy in which they practise was co-located with one or more healthcare provider (e.g. GP, optician, dental practice etc). The majority of these were co-located with GP practices ( $n=77$ ). An chi-squared analysis was undertaken to determine if co-location alongside other HCPs had any impact on the

reported levels of interprofessional interactions. **Table 5.9** highlights those HCTMs where a significant difference was found in the pharmacist's reported levels of interprofessional interaction when the pharmacy was co-located with a GP practice. By using this raw data to undertake a visual comparison (see chapter 4.3.9 and section 5.3.1.4.1 for further explanation of this process) this showed that when the pharmacy was co-located, the level of reported interprofessional interactions with those HCTMs similarly based within the GP practice (GPs, community nurse, GP practice manager, health visitor, midwife) was significantly greater ( $p < 0.05$ ) when compared to pharmacists based in pharmacies that were distinct from the GP practice. This increased level of interaction was limited to HCTMs based within the GP practice and not other HCPs with the exception of paramedics, a professional group not routinely practising within or from GP practices (Woollard, 2006).

Only a small number of responding pharmacists indicated that their pharmacy was co-located with an optician ( $n=15$ ) or dentist ( $n=10$ ) and therefore a chi-squared analysis could not be conducted as the data did not meet required criteria. However, although statistical significance could not be demonstrated, of note 66.6% ( $n=10/15$ ) of respondents working in pharmacies co-located with opticians reported interacting with opticians at least once a month compared to 12.3% ( $n=52/425$ ) of pharmacists who were not co-located, and 80.0% ( $n=8/10$ ) of respondents working in pharmacies co-located with dentists interacted with dentists at least once a month compared to 41.3% ( $n=177/429$ ) of pharmacists who were not co-located.

**Table 5.9.** HCTMs where significant differences ( $p < 0.05$ ) were found when comparing frequencies of interaction depending upon whether the respondents' community pharmacy is co-located with a GP practice

HCTM	Pharmacy co-location with GP practice	At least once a DAY	At least once a WEEK	At least once a MONTH	At least once a YEAR	Less than once a YEAR	Never
<b>HCTMs routinely located within a GP practice that show significant difference in the frequency of interaction when comparing pharmacies co-located with a GP practice and those that are not (<math>p &lt; 0.05</math>)</b>							
General Practitioner (GP) (P<0.001)	Yes (n=77)	50 <b>64.9%</b>	23 29.9%	4 <sup>^</sup> 5.2%	0 <sup>^</sup> 0.0%	0 <sup>^</sup> 0.0%	0 <sup>^</sup> 0.0%
	No (n=365)	116 31.8%	184 <b>50.4%</b>	57 <sup>^</sup> <b>15.6%</b>	6 <sup>^</sup> <b>1.6%</b>	1 <sup>^</sup> <b>0.3%</b>	1 <sup>^</sup> <b>0.3%</b>
GP practice manager (P=0.001)	Yes (n=77)	13 <b>16.9%</b>	25 <b>32.5%</b>	27 <b>35.1%</b>	8 10.4%	3 <sup>^</sup> 3.9%	1 <sup>^</sup> 1.3%
	No (n=365)	27 7.4%	74 20.3%	125 34.2%	81 <b>22.2%</b>	41 <sup>^</sup> <b>11.2%</b>	17 <sup>^</sup> <b>4.7%</b>
Health Visitor (P<0.001)	Yes (n=76)	1 1.3%	14 <b>18.4%</b>	26 <b>34.2%</b>	14 18.4%	12 15.8%	9 11.8%
	No (n=363)	6 <b>1.7%</b>	22 6.1%	64 17.6%	82 <b>22.6%</b>	107 <b>29.5%</b>	82 <b>22.6%</b>
Midwife (P<0.001)	Yes (n=76)	0 <sup>^</sup> 0.0%	1 <sup>^</sup> 1.3%	18 23.4%	18 23.4%	22 28.6%	18 23.4%
	No (n=364)	0 <sup>^</sup> 0.0%	7 <sup>^</sup> <b>2.0%</b>	24 6.7%	71 19.9%	124 34.8%	130 36.5%
Nurse (community) (P<0.001)	Yes (n=76)	24 31.6%	30 39.5%	16 21.1%	5 <sup>^</sup> 6.6%	0 <sup>^</sup> 0.0%	1 <sup>^</sup> 1.3%
	No (n=364)	24 6.6%	138 37.9%	120 33.0%	47 <sup>^</sup> 12.9%	21 <sup>^</sup> 5.8%	14 <sup>^</sup> 3.8%
<b>HCTMs not routinely located within a GP practice that show significant difference in the frequency of interaction when comparing pharmacies co-located with a GP practice and those that are not (<math>p &lt; 0.05</math>)</b>							
Paramedic (P<0.001)	Yes (n=76)	0 0.0%	1 1.3%	3 3.9%	12 15.8%	13 17.1%	47 61.8%
	No (n=364)	0 0.0%	3 0.8%	3 0.8%	35 9.6%	100 27.3%	225 61.5%

<sup>^</sup>= Categories that were combined for each specific demographic characteristic when conducting the chi-squared analysis; **Bold percentage** = percentage of respondents that is comparatively higher when comparing interactions frequencies with each HCTM dependent on the pharmacy co-location alongside a GP practice

### 5.3.1.4.3. Impact that the provision of advanced services provided from pharmacies had on respondents' reported frequency of interactions with HCTMs

Discharge medicines reviews (DMRs) are a type of Advanced pharmacy service which aims to improve the transfer of pharmaceutical care between healthcare sectors and promote interactions between community pharmacists and primary and secondary care HCPs (Ham et al., 2010; Royal Pharmaceutical Society Wales, 2015). Of the 443 respondents, 357 reported that they provide the DMR service versus 86 that do not. An analysis was undertaken to determine if pharmacists working in pharmacies that deliver the DMR service reported higher levels of interaction with HCPs. The chi-squared analysis plus visual

comparison (see chapter 4.3.9 and section 5.3.1.4.1 for further explanation of this process) revealed that community pharmacies providing the DMR service reported significantly ( $p < 0.05$ ) increased interactions with hospital pharmacists but not with other professions (see **Table 5.10**). The data showed that 75% of those pharmacists practising in community pharmacies that provide the DMR service reported interacting with hospital pharmacists at least one a month compared to 48% of pharmacists who do not provide this service.

**Table 5.10.** Community pharmacists providing the DMR service reported significantly ( $p < 0.05$ ) higher levels of interaction with hospital pharmacists

HCTM	Pharmacy provides DMR service	At least once a DAY	At least once a WEEK	At least once a MONTH	At least once a YEAR	Less than once a YEAR	Never
Hospital pharmacist ( $p=0.021$ )	Yes (n=357)	6 <sup>^</sup> <b>1.7%</b>	72 <sup>^</sup> <b>20.2%</b>	189 <b>53.1%</b>	68 19.1%	14 3.9%	5 5.8%
	No (n=86)	1 <sup>^</sup> 1.2%	15 <sup>^</sup> 7.4%	34 39.5%	26 <b>30.2%</b>	5 <b>5.8%</b>	5 5.8%

<sup>^</sup>= Categories that were combined for each specific demographic characteristic when conducting the chi-squared analysis

Only a small minority of the pharmacists surveyed did not provide the medicines use review (MUR) service (n=21/443), therefore an analysis of the impact of the service on interprofessional interactions was not possible.

### 5.3.1.5. Summary of the qualitative comments provided within the questionnaire

The final section of the questionnaire comprised a free text comments box for respondents to add any further information they deemed appropriate to the study. A total of 25 of the 443 respondents provided comments. These comments fell into six broad categories: (i) participants' relationships with healthcare professionals; (ii) perceived benefits to IPIs; (iii) perceived barriers to IPIs; (iv) perceived facilitators to IPIs; (v) methods of improving IPIs; (vi) reasons for, and frequency of, participants' interactions with specific HCPs. The full raw data is presented in Appendix K and the information was used to inform the stage two – semi-structured interviews.

### **5.3.2. Stage two – Semi-structured interviews exploring the nature of interprofessional interactions between community pharmacists and healthcare professionals**

This section describes the results for the qualitative interviews with community pharmacists which aimed to explore and better understand the IPIs taking place in community pharmacy practice and determine the value pharmacists placed on IPE.

#### **5.3.2.1. Participants**

In this study, 14 interviews were conducted at which point it was determined that the sample represented a cross section of community pharmacists, there was strong repetition of data and themes, and the study aims had been achieved (Bowen, 2008; King and Horrocks, 2010a; Malterud et al., 2015). The participants recruited had a range of characteristics that included variations in: (i) the length of time working within the community pharmacy branch in which the interview took place; (ii) the depth of experience of interprofessional education; (iii) co-location with other HCPs; (iv) the location of the participants pre-registration training; (v) the location of the community pharmacy (e.g. city/town high street, rural, etc.); (vi) the health board in which the pharmacy operated; (vii) the size of the company for which the community pharmacy operated.; (viii) the university of study of the participant and (ix) the year participants graduated from university. **Table 5.11** provides details of these demographic variations for each participant however in order to maintain anonymity the Local Health Board (LHB) and location of the participants have been excluded and more generally summarised. The pharmacists interviewed were recruited from three of the seven Welsh LHBs: (i) Cardiff and Vale University Health Board (UHB) (n=7); Abertawe Bro Morgannwg UHB (n=4) and (iii) Aneurin Bevan UHB (n=3). Pharmacists worked across a range of locales including: (i) city/town high street (n=5); (ii) rural/village pharmacies (n=5) and (iii) city/town residential suburbs (n=4). Participants were not recruited from other LHBs primarily due to limited response from potential participants, geographical convenience, limited time to conduct the study and the belief that strong repetition of data and study aims had already been achieved.

As the participants were asked specifically about their experiences in the particular pharmacy where the interview took place, it was important to identify the time each participant had worked in that specific branch in order to understand the impact this may

have on their interprofessional experiences. The length of time participants had been employed in the branch varied significantly, from 8 months to 33 years.

Participants also varied in their experience of IPE. Six participants had undertaken IPE during their undergraduate studies, three had postgraduate experience and the remaining five had no experience of IPE. However, of those that had no experience one described exposure to learning that was led by doctors, and two others acknowledged they had teaching surrounding interprofessional working although this could not be classified as IPE as no other professions were present. These experiences were often drawn out when discussing whether they had 'training in interprofessional working', with two participants unaware of the concept of IPE. During the interviews P11 also acknowledged that hospital pharmacists may have the chance to gain more interprofessional experience compared to community pharmacists as they rotate around different wards. P4 stated that they are aware that other universities, outside of Cardiff, do joint learning with HCPs, i.e. have shared lectures.

Throughout the analysis of the interviews it was evident that a number of demographic traits of participants and their pharmacies had little or no perceived impact on the 14 participants' interprofessional interactions, including: (i) pre-registration training location; (ii) pharmacy locality (i.e. rural, city/town, etc.); (iii) health board and (iv) size of pharmacy company. Whilst these factors are absent from the interviews it must be noted that (as with all the qualitative data published) this is not generalisable and the completion of more interviews may have identified these as impacting IPIs (see 5.4.1. limitations).

**Table 5.11.** Characteristics of each community pharmacist interview participant (n=14)

<b>Participant number</b>	<b>Year registered</b>	<b>University of study (Cardiff or another UK Uni)</b>	<b>Previous experience of IPE</b>	<b>Sector of Pre-registration training</b>	<b>Time worked in branch</b>	<b>Pharmacy classification</b>	<b>Co-location with another HCP</b>
<b>P1</b>	2000	Cardiff	Yes (PG)	Community	6 yrs	Independent	No
<b>P2</b>	2012	Cardiff	No	Community	3 yrs	Multiple	No <sup>^</sup>
<b>P3</b>	2012	Cardiff	Yes (PG)	Hospital	4 yrs	Independent	No
<b>P4</b>	2012	Cardiff	No	Hospital	1.5 yrs	Independent	No
<b>P5</b>	1980	Other	No	Community	33 yrs	Independent	Optician
<b>P6</b>	2015	Cardiff	Yes (UG)	Community	8 mnths	Independent	No
<b>P7</b>	2005	Other	Yes (UG)	Hospital	3 yrs	Multiple	GP <sup>^</sup> & Dentist
<b>P8</b>	2013	Cardiff	Yes (UG)	Community	1.5yrs	Multiple	Optician
<b>P9</b>	2013	Cardiff	Yes (UG)	Community	1 yr	Multiple	No
<b>P10</b>	2007	Other	Yes (UG)	Community	5 yrs	Multiple	GP <sup>^</sup>
<b>P11</b>	2015	Cardiff	Yes (UG)	Community	1.5 yrs	Multiple	No
<b>P12</b>	2010	Cardiff	No	Community	5 yrs	Multiple	GP <sup>^</sup>
<b>P13</b>	2002	Other	Yes (PG)	Hospital	4.5 yrs	Independent	GP <sup>^</sup> & Dentist
<b>P14</b>	2002	Cardiff	No	Community	4.5 yrs	Multiple	GP <sup>^</sup>

GP<sup>^</sup> = General Practitioner surgery, which may also contain other professions generally located alongside GPs (eg. community nurses, health visitors, midwives).

No<sup>^</sup> = Although not attached was in close proximity to a GP surgery (around 100 metres away)

### 5.3.2.2. Deductive data analysis

Deductive thematic analysis was employed to identify: (i) participants' frequency of interactions with other HCPs; (ii) the nature of participants' interprofessional interactions; (iii) the mode with which the interactions occurred; (iv) any areas where participants learnt from other HCPs during interactions; (v) the topics participants would like to learn from other HCPs; (vi) participants' suggestions for the design and implementation of IPE. All participants understood the term 'interprofessional interactions' to be broadly "*any sort of communication that we have with other healthcare professionals*" (P13).

#### 5.3.2.2.1. Healthcare professionals discussed during the interviews

A number of different HCPs were discussed throughout the interviews in addition to GPs, community nurses and dentists (the three most frequently interacted with HCPs as identified within the questionnaire phase of this study). For some participants, the ranking exercise revealed that they interacted with other HCPs more frequently than GPs, community nurses and dentists. For these participants, the HCPs they selected were discussed in detail as well. Participants also had the opportunity to discuss any other HCPs or members of the wider healthcare team that they felt were of relevance to the study. This resulted in discussions about a further 17 HCTMs. Social workers (11/14) and hospital doctors (9/14) were discussed by participants most frequently with all other professions mentioned by five or fewer participants (see **Table 5.12**). Of the 17 HCPs that featured in the ranking exercise three HCPs were not mentioned by any participants namely occupational therapists, radiographers & speech and language therapists. Physiotherapists were only mentioned by one participant but only to state that they had no interprofessional interaction with this HCP.

**Table 5.12.** Number of community pharmacist interviews in which interactions with a HCTM was discussed (max. n=14)

HCTM	Number of participants
<u>Three HCTMs including:</u> Community nurse, Dentist, GP	14/14
Social worker	11/14
Hospital doctor	9/14
<u>Three HCTMs including:</u> District nurse, Hospital nurse, Optician	5/14
<u>Three HCTMs including:</u> Health visitor, Secondary care staff, Vet	4/14
<u>Three HCTMs including:</u> Dietician, Hospital Pharmacist, Other pharmacists	3/14
<u>Three HCTMs including:</u> Carers, Local addiction doctors, Midwives	2/14
<u>Four HCTMs including:</u> Care home staff, Paramedic, Physiotherapist, Podiatrist	1/14

### 5.3.2.2.2. Participants' frequency of interaction with HCPs

During the interviews, when participants discussed a HCP, the participant's reported frequency of interaction was determined (see **Table 5.13**). The data showed that all participants interacted with GPs at least once a month, with nine stating they interacted at least once a week, and four stating they interacted on a daily basis with GPs. Although all participants also stated the frequency they interacted with dentists (n=14) the frequency of interaction was more varied, with half of the participants (n=7) interacting at least once a month but no participant interacting daily. Ten participants stated their frequency of interaction with community nurses with eight of these participants indicating they interacted with nurses at least once a month and one participant indicating they had daily interactions.

**Table 5.13.** A comparison of the frequency of interaction between community pharmacists and HCPs discussed during the interviews (n=14)

HCP	At least once a day	At least once a week	At least once a month <sup>^</sup>	At least once a year <sup>^^</sup>	Less frequently	Never
<b>GP</b> (n=14)	4	9	1	-	-	-
<b>Dentist</b> (n=14)	-	3	4	3	3	1
<b>Community nurse</b> (n=10)	1	5	2	1	-	1
<b>Hospital Doctor</b> (n=9)	-	-	3	3	1	2
<b>Social Worker</b> (n=6)	-	4	1	1	-	-
<b>District Nurse</b> (n=5)	-	2	3	-	-	-
<b>Hospital Nurse</b> (n=4)	-	-	2	1	-	1
<b>Optician</b> (n=4)	1	2	-	1	-	-
<b>Midwife</b> (n=2)	1	-	-	-	-	1
<b>Health visitor</b> (n=1)	-	1	-	-	-	-
<b>Dietician</b> (n=1)	-	-	-	-	-	1

<sup>^</sup>The term occasionally was given an 'at least once a month' frequency

<sup>^^</sup> The terms not often and rarely were given an 'at least once a year' frequency

### 5.3.2.2.3. The content of participants' interactions with other healthcare professionals

The content of participants' interactions with HCPs broadly fell into two categories (see **Tables 5.14a** and **b**), namely 'clinical' interactions and 'practical' interactions. Clinical

interactions were defined as those occasions where the pharmacists and HCP engaged to discuss 'clinical scenarios' in order to benefit the clinical care of the patient, examples here would include dose confirmations or resolution of drug interactions. Practical interactions were defined as occasions where there was interaction with a HCP to discuss non-clinical, practical or logistical patient issues, such as the supply of medications (e.g. when there was a manufacturing delay) and prescription writing errors which were clerical/administrative mistakes and not clinical in nature. All topics identified by participants fell into one of these two categories. To do this it was important to clarify the context of interactions, for example pharmacists contacted GPs to discuss the clinical implications of DMRs (clinical interaction) as well as to inform GPs when the DMR was conducted (practical interaction).

It was evident from the data that the majority of interactions with GPs, community nurses and dentists involved discussions about the prescribing of medications and associated clinical or practical issues. This included confirming doses, discussing drug-drug interactions, discussing patient allergies, highlighting NHS blacklisted items and other issues associated with prescriptions. Discussing prescribing errors was a particular feature of interprofessional interactions with dentists, with P11 stating that *"dentists can't prescribe well"*, and P4 believing *"they're historically not great at writing scripts so they will write things incorrectly or wrong formulations"*. One reason for this was potentially because the majority of prescriptions are handwritten by dentists as P9 explained *"because dentist prescriptions are handwritten that is a massive issue because the handwriting isn't the best and you can't understand what they've written then you have to call them, so a lot of the time it is for that reason and that would be 90% of the calls"*.

Interactions with GPs often featured discussions about patients as well as the provision of patient services. One service where pharmacist-GP interactions was particularly strong was the DMR service; *"we do discharge reviews, it's quite important to speak to the GP because they know best anyway and if anything needs to change"* (P6). However, participants also acknowledged how interprofessional interactions relating to other services, such as MURs, was not occurring as much as desired and represented a missed opportunity for collaboration in order to improve patient care; *"with MUR forms... recommendations you put in, I don't think they even read them half the time because you don't get anything back so that is the only problem"* (P11).

Community nurse discussions largely focused on the use of dressings and the stock/supply of medications; *"a lot of the time about dressings so they do a lot of dressing orders through*

us" (P7). These interactions were similar to those of the district nurse; *"it's pretty much the same interaction (between community nurse and district nurse)"* (P4).

Interactions with social workers were seen as *"a big thing"* (P9) often concerning the patient's wellbeing, medication adherence or a source of information; *"sometimes you can't speak to the patients so you speak to the social worker... if anything's changed then its best to speak to them (rather) than the patient"* (P6), *"they (social workers) will often ring us again because we are the ones who have the maximum contact with clients"* (P1).

Participants reported that they frequently interacted with professionals in secondary care, including hospital doctors, nurses and pharmacists, particularly related to discharge from or admission to hospital. This often involved an exchange of information to ensure seamless transfer of care; *"when we need to interact with secondary care like that its more often for admission or discharge"* (P1). Of note, interactions with these secondary care HCPs were found to be similar to their primary care counterparts, with participants reporting occasions where they contacted hospital doctors to discuss patients and address prescription issues such as doses or drug interactions; *"so often again we get in contact with the doctors in the hospital to clarify prescriptions so we can give them to the patients"* (P8).

Interactions with opticians, were nearly always reported to be related to the referral of patients from one service to another with direct contact with the optician a rare occurrence; *"typically erm someone would walk in with symptoms such as pain in the eye or if they've had it for a long period of time and its really red or something like that where we wouldn't feel comfortable to sell them something before they're seen, erm so we've got these referral cards that we can write on and then they can take that upstairs obviously to the optician or to anybody on the high street"* (P6).

Interactions with health visitors (HV), whilst less common, often involved pharmacists referring young patients for specialist advice or discussions about childhood vaccinations, formulations needed for babies, or administrative issues with prescriptions written by the HV. On the single occasion where a participant described interacting with a midwife this was related to the use of baby milk; *"midwives are actually really good at teaching me about baby milks"* (P7). Dieticians were the final profession with whom participants specifically described interprofessional interactions. Two participants described having discussed wasted nutritional drinks and the provision of lactose free medications; *"mainly we get contacted by them or we try contact them if patients are wasting a lot of... you know a lot of*

*patients are prescribed Ensure® and drinks, we get masses back” (P2), “(we) had a query last week from a dietician, we have got one lady who’s query lactose intolerant so asked us to source all her medication in lactose free form” (P13).*

Further details relating to the clinical and practical reasons for interprofessional interactions can be seen in **Tables 5.14a** and **5.14b**.

**Table 5.14.a.** The reasons community pharmacist interview participants (n=14) reported interacting with HCPs, categorised as either clinical or practical interactions, and the number times each reason was discussed across the 14 interviews

HCP	Clinical interactions (interactions about clinical scenarios to benefit clinical patient care)	Practical interactions (interactions about non-clinical, practical or logistical patient issues)
GP (n=14)	Dose confirmation (n=8), Patient discussions (n=7), Clinical prescription queries (n=4), Drug interactions (n=3), Stopping medications (n=3), Medication clarification (n=2), Alternative medications (n=2), Compliance aids (n=2), Pharmacist providing medication information (n=1), Prescribing habits (n=1), Controlled drugs (n=1), Checking blood results (n=1), DMRs (n=1), MURs (n=1)	Medication stock/supply (n=9), Prescription writing errors (n=3), Delivery of medications (n=2), Referral for flu jabs (n=1), Informing GP on use of services (n=1), GP determining medication costs (n=1), Informing GP of discharge medicine review (n=1), Urgent prescription for pharmacy to complete (n=1)
Dentist (n=13)	Dose confirmation (n=7), Drug interactions (n=3), Antibiotic allergies (n=2), Discuss drugs with narrow therapeutic window (n=1), Dentist checks drug history with Pharmacist (n=1)	Prescription writing errors (n=6), Blacklisted items on Rx (n=4), Medication stock/supply (n=3), Branded vs generic medication (n=1)
Community nurse (n=13)	Dressing discussions (n=6), Patient discussions (n=4), Medication advice (n=4), Vaccinations/injections (n=3), Drug interactions (n=2), Dose confirmation (n=2), Prescribing advice (n=2), Syringe drivers (n=1), Malaria advice (n=1)	Medication stock/supply (n=5), Inform CN on flu jabs done (n=1), CN looking up bloods for P (n=1), When GP not available (n=1)
Social workers (n=11)	Patient discussions - <i>addiction patients</i> (n=3), Medications changing (n=1)	Patients difficulty with medications - <i>compliance</i> (n=4), Patient discussions (n=3), SW using MAR charts (n=2), Hospital admission/discharge (n=1), SW picking up patient medications (n=1), When Pharmacist can't get through to patient (n=1)

**Table 5.14.b.** The reasons community pharmacist interview participants (n=14) reported interacting with HCPs, categorised as either clinical or practical interactions, and the number times each reason was discussed across the 14 interviews

<b>HCP</b> (number of participants who commented)	<b>Clinical interactions (interactions about clinical scenarios to benefit clinical patient care)</b>	<b>Practical interactions (interactions about non-clinical, practical or logistical patient issues)</b>
<b>Hospital Doctor</b> (n=8)	Dose confirmation (n=5), Patient discussions – <i>addiction patients</i> (n=1), Drug interactions (n=1), Doctor checks drug history with pharmacist (n=1)	Prescription writing errors (n=4), Hospital admission/discharge (n=2)
<b>Hospital Nurse</b> (n=5)	Speak to specialist diabetes/Parkinson’s nurses about patients (n=1), Discharge prescriptions (n=1)	Hospital admission/discharge (n=5), Nurse is gatekeeper to Doctor (n=1), Discharge blister packs (n=1)
<b>District Nurse</b> (n=5)	Dressing discussions (n=2), Prescribing advice (n=1), Medication advice (n=1)	Medication stock/supply (n=1), Nurse collecting patient medications (n=1)
<b>Opticians</b> (n=5)	Pharmacist refers patients for examination (n=5), Optician refers patients for purchasing (n=5)	Optician purchased general products from pharmacy (n=1)
<b>Health Visitor</b> (n=4)	Referral with baby queries (n=2), Medication advice (n=1), Dose clarification (n=1), Vaccinations (n=1), MAR chart discussions (n=1), Formulation/ administration discussions (n=1)	Prescription writing errors (n=1)
<b>Hospital Pharmacist</b> (n=3)		Hospital admission/discharge (n=3)
<b>Dieticians</b> (n=2)	Whether medications were lactose free (n=1)	Wasting liquids (n=1)
<b>Midwives</b> (n=1)	Baby milk discussions (n=1)	

#### 5.3.2.2.4. Mode of interaction

The reported mode of interaction with HCPs was also elucidated during the interviews (see **Table 5.15**). Interactions could generally be categorised into three modes: (i) face-to-face interactions; (ii) interactions that took place over the telephone (iii) a mixed approach that included face-to-face interaction and a telephone conversation. Some participants reported interactions by other methods including through referral cards, faxes and via another HCP (namely the GP) but these were less common. In addition, both the pharmacist and GP were seen to initiate interactions with one another, whilst for community nurses, it was more common that the nurse initiated communication.

Data presented within **Table 5.15** shows that the reported mechanism of interaction varied depending on the HCP, for example interactions with the dentist were mainly conducted over the phone (11/13) however a mixed approach of both face-to-face and over the phone was the case for community nurses (9/14). Other forms of communication included a letter which was received from a dietician regarding lactose free medications and faxed prescriptions from the hospital doctors. In addition, participants added how interactions with HCPs were occasionally facilitated through the general practice; *“we just contact the surgery, they put us in touch with the dietician or the surgery will contact the dietician”* (P2).

Co-location with HCPs was also found to have an impact on the reported mode of interaction, something which was particularly evident when examining the pharmacist-GP interaction. Here the data showed that 4 of the 5 participants who were co-located with GPs had face-to-face contact (as well as phone contact), *“well obviously it’s just next door so if I’ve got a query I’ll pop in and we can nip in between appointments”* (P13). This was in contrast to those participants who were isolated from the GP practice; *“over the phone yeah I’ve never met them face-to-face”* (P11). This finding was similarly described with dentists, as both participants who were co-located with dentists reported frequent face-to-face contact. For nurses, face-to-face interactions was the primary mode of interaction irrespective of co-location; *“some do come in if they want to drop in a prescription for someone”* (P9), *“they quite often phone us from the patients’ home or erm they’ll come in if they’re on route to the patient”* (P13). However, some participants also believed that interactions with nurses was aided by close proximity; *“because the surgeries that we deal with that are right near us, I am so much closer to the GPs and the nurses because I can see them whereas the other ones I don’t physically see them it’s just a phone conversation and I think that makes a difference”* (P2). Co-location had a limited impact on pharmacist-optician interactions, with only one of two

participants who were co-located with opticians interacting face-to-face, the other used referral cards to communicate.

**Table 5.15.** A comparison of community pharmacist interview participants' modes of communication with different HCPs

<b>Healthcare Professional</b>	<b>Telephone only</b>	<b>Face-to-face only</b>	<b>Mixed approach<sup>^</sup></b>	<b>Other/Addition information</b>
GP (n=14)	10	0	4	P contacts GP (n=6) GP contacts P (n=5)
Community Nurse (n=13)	3	1	9	P contacts CN (n=1) CN contacts P (n=3)
Dentist (n=13)	11	0	2	
Hospital Doctor (n=5)	5	0	0	Faxes new Rx (n=2)
Social Worker (n=4)	2	0	2	
District nurse (n=4)	2	2	0	
Optician (n=4)	0	1	0	Referral card (n=3)
Hospital Nurses (n=3)	3	0	0	
Health visitor (n=2)	1	1	0	
Dietician (n=2)	1*	0	0	Letter (n=1)
Midwife (n=1)	0	1	0	

\* = also through the GP

<sup>^</sup> = mixed approach included both face-to-face and telephone

### 5.3.2.2.5. Other healthcare team members of note

All interviews featured discussion of the interactions with GPs, dentists and nurses, participants were then afforded the opportunity to discuss any other HCTMs they felt were important. A general overview of interactions with these HCTMs is presented in **Table 5.16**.

**Table 5.16.** *Descriptive overview of community pharmacists' interactions with other HCTMs not previously categorised due to limited information provided across interviews*

<b>Podiatrists</b>	Only one participant (P5) had IPIs with podiatrists due to co-location within the pharmacy (podiatrist run clinic within pharmacy; 8-10 appointments once a week). IPIs were not professional in topic, with the only clinical information gained from the patients and not directly from the Podiatrist.
<b>Care home staff</b>	Care home staff were stated as P4s most frequent HCP interaction (4-5 times per day) because the pharmacy engaged with a large number of care homes, handling and a significant number of queries from the staff regarding prescriptions. Care home staff often asked in-depth medical queries which the pharmacist dealt with directly.
<b>Vet</b>	Four participants mentioned their interactions with vets (P3,P7,P10,P13). The IPIs with vets were often because a practice was close by, therefore the pharmacy dealt with veterinary prescriptions, however this was not common. One participant (P7) stated that their previous pharmacy was in a rural area leading to more frequent IPIs. This participant also stated that they found interactions with the Vet challenging when the pharmacist refused to supply medications for animals.
<b>Carers</b>	Carers were reported by some participants to be helpful in discussing patient issues, particularly about patients capacity to swallow medications and medication administration (MAR charts and dossett boxes) (P3 and P4)
<b>Drug and alcohol team doctors</b>	Participants P1 and P10 stated they speak to these doctors (GPs/consultants/mental health doctors), with P10 stating this is every now and then about correct prescribing, particularly dates on prescriptions.
<b>Other Pharmacists</b>	P10 had a meeting with cluster pharmacists to discuss DMRs. P3 and P4 stated how they would recommend/direct patients to other pharmacies, particularly when out of stock. One participant stated that they learnt the most from other pharmacists, particularly about bisphosphonate breaks, with another learning about endorsing.
<b>Paramedic</b>	P12 mentioned how as they are on a busy street they may need to contact paramedics if patients are unwell.
<b>Physiotherapist</b>	Only one participant mentioned physiotherapists and this was to state that they don't have a great deal of interaction (P13).
<b>Secondary care staff</b>	Here four participants (P1, P2, P9, P13) stated how they interacted hospitals staff regarding admission and discharge of patients. The specific HCPs were not always referenced participants mentioned 'hospital staff'. P13 did elaborate and stated these were mainly doctors and secretaries. P9 also indicated how some hospitals are better than others at informing them about medication changes that have occurred within the hospital effecting IPIs.

### 5.3.2.3. Inductive data analysis

This section describes the results of an inductive thematic analysis of interview transcripts which was used to identify themes within the interviews. This yielded six main themes and a series of associated subthemes (see **Table 5.17**).

**Table 5.17.** Themes/subthemes identified through inductive, thematic analysis of community pharmacist interviews (n=14)

Theme	Subtheme
1. Perceived benefits of interprofessional interactions	1.1. Benefits to the patient 1.2. Benefits to the pharmacist and other HCPs
2. Perceived barriers to interprofessional interactions	2.1. Lack of time leading to busy/stressed pharmacists and HCPs 2.2. Difficulty in accessing HCPs 2.3. Lack of understanding or poor perception of professional roles 2.4. Having poor interprofessional relationships 2.5. Restrictions in HCPs passing information to pharmacists 2.6. Negative attitudes of HCPs
3. Perceived facilitators to interprofessional interactions	3.1. Having good relationships with HCPs 3.2. Building good relationships with HCPs over time 3.3. HCPs being easily accessible 3.4. Improving lines of communication between HCPs 3.5. Pharmacists having good interpersonal skills 3.6. Providing a high-quality pharmacy service
4. Impact of co-location on interprofessional interactions	4.1. Not being co-located alongside HCPs has a negative effect on interactions 4.2. Being co-located alongside HCPs benefits interactions
5. Learning from and educating about interprofessional interactions	5.1. Pharmacists can learn from other HCPs 5.2. Pharmacists don't learn from all HCPs 5.3. Benefits and suggestions for IPE in pharmacy
6. Impact of the receptionist on interprofessional interactions	6.1. Receptionists' broker role in HCP interactions 6.2. Receptionists' broker role as a barrier to interactions 6.3. Receptionists being helpful in resolving patient issues 6.4. Need for a good relationship with receptionists

#### 5.3.2.3.1. Perceived benefits of interprofessional interactions

The benefits of interprofessional interactions (IPIs) were separated into two subthemes:

- 1.1. Benefits to the patient
- 1.2. Benefits to the pharmacist and other HCPs

### 1.1. Benefits to the patient

With the exception of participant 6 (P6), all participants stated IPIs could provide patient benefits. Of these, helping to achieve a *“better level of care”* (P12) was the most frequently stated benefit (n=6) with P13 believing that *“obviously you need to communicate with each other to get the best outcomes for patients”*. In addition, participants felt IPIs could *“help solve a lot of patient issues”* (P3) including prescription problems and gave them a *“fuller picture”* (P7) of each patient thus helping make practice more seamless resulting in quicker resolution of issues and stopping patients going back and forth between HCPs. Participants also believed IPIs helped improve medication optimisation for patients and gave them *“more enhanced care, (and) more personalised care”* (P4). Other reported patient benefits included an improvement in safety as IPIs helped *“query or clarify stuff which ultimately leads to patient safety and making sure that patients get the best out of their healthcare that we provide”* (P8).

### 1.2. Benefits to the pharmacist and other HCPs

Eight participants stated that there were potential benefits of IPIs to the pharmacist and associated HCPs with a perception that such interactions could help all parties being the most frequently reported benefit (n=4). IPIs were said to allow HCPs to gain *“reassurance and confidence”* (P1) from one another and provided an insight into *“their ways of thinking”* (P1). Participants also viewed IPIs as learning opportunities which could help fill knowledge gaps when solving problems and get the most out of one another; *“if we have any er questions or any gaps in our knowledge if we can ring a doctor up or someone that you have a good relationship... then you can solve problems”* (P6). Interactions were also reported to *“help build relationships so that if there are any problems the doctor can contact us or us contact them and not have to trouble patients”* (P2). This was seen to enable easier access to one another and also reinforce the pharmacist's own role, for example as an *“antibiotic guardian”* (P1). IPIs were also reported to help relieve pressure on other services; *“interaction between two health professionals who are fairly close locally in theory then should also then play a role in NHS Wales to take the pressure off the other health professionals i.e. GPs and A&E”* (P1).

### 5.3.2.3.2. Perceived barriers to interprofessional interactions

The barriers to IPIs were divided into six subthemes:

- 2.1. Lack of time leading to busy/stressed pharmacists and HCPs
- 2.2. Difficulty in accessing HCPs
- 2.3. Lack of understanding or poor perception of professional roles
- 2.4. Having poor interprofessional relationships
- 2.5. Restrictions in HCPs passing information to pharmacists
- 2.6. Negative attitudes of HCPs

#### 2.1. Lack of time leading to busy/stressed pharmacists and HCPs

P11 summarised the lack of time within the healthcare environment by stating that *“no healthcare professionals have time to communicate and learn from one another”*. A number of participants alluded to the limited amount of time pharmacists have to engage with other HCPs, with P7 believing that *“the pressure on community pharmacists is getting on to breaking point”*. P12 felt that even though having more IPIs would be a benefit, the patient facing role of the pharmacists is the priority; *“you would give a much better care if you could do more (interactions) but I’m not sure if it would be possible to have much more of the time without something else giving... you’re patient facing and that you have to deal with the patient first”*. P11 also felt that the pharmacy *“would lose business”* if they spent more time doing other things like IPIs. These factors contributed to the sense that even when there are reasons to interact finding time to do so can be difficult meaning pharmacists don’t then go out of their way to interact; *“(even) when there is a reason for us to interact because of time constraints it’s difficult... (because of) time constraints we don’t always go out of our way to engage”* (P7).

In addition to pharmacists’ limited time for interactions, a number of participants indicated that other professionals were similarly time constrained. This was said to be most acute for GPs due to a perceived heavy workload and the demands of such a patient facing role; *“their timing is stretched a lot erm I really do think there needs to be more GPs readily available... they don’t have time (to interact) because whenever they’re in surgeries they’re running clinics or doing XYZ”* (P9), *“I guess they’re busy... they have surgery most of the time and they do house visits, sometimes we can’t get in touch with them so we have to wait like a day or two, by that time the patient is waiting as well”* (P2) . These constraints often meant that GPs commonly have to ring pharmacists back; *“often when I ring they always in surgery so they’ve got to ring us back erm 9 times out of 10”* (P8). The GP’s limited ability to respond can also

leave pharmacists and patients frustrated; *“they’ll say oh I’ll deal with it once all the patients are in, that then can leave a patient being frustrated because they come in with a prescription, you’ve identified an error or an issue, you try to speak to the GP, and have to say to the patient well we’re going to have to wait until 12.30-1 o’clock to speak to the GP”*. Although many participants were conscious of the demands of the GP’s role, these factors resulted in hesitation in initiating an interaction at certain times for one participant; *“you don’t want to interrupt them from what they are already doing... very few things would happen in primary care that can’t wait until the end of the morning or afternoon surgery, should they need to be interrupted in the middle of surgery it would have to be particularly important, almost emergency in nature”* (P1). P11 summarised how the shortage of time for all HCPs impacted interactions, stating that *“lack of their time, lack of our time”* was the biggest barrier to conducting IPIs.

### 2.2. Difficulty in accessing HCPs

The difficulty in accessing HCPs was stated as the *“biggest barrier”* to interactions by P11. Participants found it challenging to get hold of a number of professionals including GPs, hospital doctors (and other secondary care staff), community nurses and dentists. GPs were most frequently identified as the professional group that was the most challenging to get hold of, both due to their time constraints (see theme 2.1) as well as the broker role of the receptionist (see theme 6.2).

In contrast, in secondary care the main challenge was identifying the correct person to contact; *“we would have to chase them up to find out actually what they were prescribing erm and that is actually very difficult I find to actually get hold of that doctor when you need them erm sometimes it can take a day, a day or two or someone will have to do erm more research on who actually prescribed it because you can’t actually, from the signature see who signed the prescription”* (P9).

Another reason alluded to by both P10 and P11 was that they do not have direct contact numbers for some HCPs, which makes it challenging to contact professionals. A further complication articulated was that even with a direct contact number it was difficult to ascertain which specific HCP was looking after certain patients; *“we don’t really have a contact, we have to go through the surgery to contact the district nurse so it would be quite beneficial to be able to contact the district nurse directly erm or know which patients are being seen by a district nurse”* (P10).

### 2.3. Lack of understanding or poor perception of professional roles

During the interviews some participants articulated that they did not understand certain HCP roles, this resulted in difficulties when trying to appropriately signpost patients to relevant professions; *“I would tell the patients to get in touch with a podiatrist, but I didn’t actually know where or how it works”* (P2). Similarly, HCPs were also described to have a limited understanding of the role of the pharmacist and could thus be dismissive to the role, *“some doctors are a bit dismissive (of the pharmacist’s role)”* (P3) which was perceived to lead to an underutilisation of the pharmacist’s skill set. Some participants went on to suggest reasons for this, including the GP’s belief that the pharmacist is only engaging with them to make money, *“they don’t appreciate that pharmacists are doing it to take the pressure off them not to just take their money”* (P7), or to take away GP services. This made it challenging when new pharmacy services are commissioned as these can become barriers to interactions; *“certain services I feel this can build barriers and conflict, like the influenza vaccine, probably the one that has caused a little bit of that of late over the last 2-3 years”* (P1). In addition, when HCPs did not understand the pharmacist role this made interactions challenging and in some cases caused conflict between the HCPs, with P11 stating that hospital nurses *“don’t tend to understand that we need a prescription so they can get a bit arsey at times”* and P7 describing how *“it was difficult because each time we spoke to them (vets) it was more some form of conflict, some form of disagreement that we had to get them round to why we were saying no (to dispensing medication for animals)”*.

### 2.4. Having poor interprofessional relationships

A number of participants stated having poor interprofessional relationships with HCPs and their associated practices can negatively impact interactions; *“(I) used to have more interaction I suppose because when we had a regular GP here he might ask what particular patient erm certain aspects about them but because they don’t know me now and I don’t really know them we don’t get much of that... its primarily just query-onic”* (P5). It was suggested that this could be due to the number of HCPs they need to engage with; *“it’s quite hard here because we’ve got so many surgeries that we work with we don’t get to know them”* (P6).

### 2.5. Restrictions in HCPs passing information to pharmacists

One particular issue reported was that of patient confidentiality when, in some cases, HCPs were unwilling to share patient-related data. This meant that pharmacists were hampered in their provision of care; *“we don’t get anything sent to us and I know it’s a lot to do with confidentiality why we don’t but that’s fair enough, if the lines of communication were there”*

*that we could contact the GPs for certain issues or something like that then I think it would improve a lot more” (P9).*

### 2.6. Negative attitudes of healthcare professionals

The attitude of HCPs also had an impact on some participants interprofessional engagement. This was particularly evident with P9 and community nurses who articulated that *“they believe, some of them, that they’re doctors at times so they have that attitude and aura about them”* which made communication particularly difficult.

### **5.3.2.3.3. Perceived facilitators to interprofessional interactions**

The facilitators to IPIs were separated into six subthemes:

- 3.1. Good relationships with HCPs
- 3.2. Relationships building over time
- 3.3. HCPs easily accessible
- 3.4. Improving lines of communication between HCPs
- 3.5. Pharmacists having good interpersonal skills
- 3.6. Providing a high-quality pharmacy service

#### 3.1. Good relationships with HCPs

A number of participants acknowledged they enjoy having IPIs, they have good relationships with HCPs and they feel part of the GP practice team, with P13 stating that they *“wouldn’t change anything”* regarding their interactions as *“they have a good set up”* with the practice next door and felt there was no barriers to these interactions. Two participants (P14 and P4) also stated how staff within the GP practices in the area were open and helpful and willing to take the pharmacist’s advice seriously, which enhanced the productivity of the interactions, with P14 stating that they *“can pop over and highlight concerns with them you know, they don’t just brush me off, they do take me seriously, more than I have in previous experiences working as a community pharmacist”*. *“Nice healthcare professionals”* (P3) also helped aid interactions by being more welcoming and helpful, thus making pharmacists, like P3, more willing to engage.

A number of participants alluded to positive experiences with dentists, stating that they were good at getting back to the pharmacists, they acknowledged and accepted the pharmacist’s advice, they were helpful, and they seemed to have more time to interact than GPs. P9 felt they and the GPs understood the interactions were for the patients and had

respect for one another resulting in *"100% of the time (had) a positive outcome"*. P3 also felt that some GPs appreciated the role of the pharmacist stating that within one GP practice *"they really appreciate everything we do in pharmacy, but yeah in some other surgeries they're a bit more difficult"*. Three participants also made direct reference to the good, prompt, to-the-point interactions with community nurses, which helped encourage both parties to engage with each other. P7 also felt that they were *"open and appreciative of each other's roles and understanding what we do"* which helped focus interactions and meant that professional expertise was properly utilised.

### 3.2. Relationship building over time

A number of participants also acknowledged how relationships build over time, with P1 stating *"the more interaction you have then clearly you build relationships with people and that familiarity would carry in your practice and then, erm, probably build better relationships"*. Participants also stated that it takes time to get to know the HCP well and be on *"first name terms"* (P6), however when this does happen this helps make interactions more comfortable and builds trust. P5 also acknowledged how relationships with some HCPs that were initially negative improved over time; *"we initially had no interaction at all with nurses... they were very obstructive when I phoned up... they just said they weren't interested... (then once got to know them) they started coming in and we actually got on well with the nurses so we now deal with them quite a lot"* (P5). P6 also felt that getting to know one another and understanding what each other wants would be beneficial, saying it *"would just be nice to kind of get to know them and just see who you're actually speaking to and see kind of what they would like from us and just get that chance to sit down and think okay what we want and build that, so everyone knows what they want from each other really"*.

### 3.3. HCPs easily accessible

Although a small number of participants stated that access to dentists was challenging, five participants stated how easy they found it to contact them, with P1 emphasising that *"dental practices tend to have an open-door policy where it is easy to communicate"* with P11 adding *"they're probably easier to get through to than GPs, tend to have a bit more time I think, they are quite happy to come to the phone and talk directly"*. In addition, P6 also articulated that there were no barriers to communicating with GPs believing *"what they have in place works quite well"*, although all other participants felt there were barriers to this interaction (see theme 2.2).

### 3.4. Improving lines of communication between HCPs

Nine participants acknowledged that they would like more communication with HCPs. A number of methods to increase communication were suggested including improving lines of communication for example with call back systems, direct emails or by attending GP practice meetings. In addition, the production of a 'formulary' of direct line telephone numbers to HCPs was suggested as something which may help; *"I don't actually know who the midwife for the area or for the surgery is, so you always go back to the GP but the GP has so much to do so there needs to be like a formulary or something"* (P2). Although six participants suggested attending GP practice meetings, one participant was unsure if the GPs would actually want the pharmacist to attend as they each belong to different companies; *"they've got their own business and we've got a different business, we're not linked at all so they probably wouldn't want me involved in a lot of their meetings because they don't have me being nosey probably"* (P10). In contrast, P2 stated the benefits of such meetings to the practice; *"I think what's really important is trying to have that time to meet these doctors, once we started doing these multidisciplinary meetings with the surgeries around the corner, we have been able to share our workload because we do the smoking service here and flu, they're aware of it, they're able to send people to us and that takes the load off them, but if you don't have that time to actually go and speak to them, it's a bit more difficult"*. One participant (P12) already engaged in meetings within the practice to which they were attached and felt that meeting other doctors outside of that practice would also be beneficial.

Some participants felt that the NHS/LHB could help encourage relationships and make HCPs aware of pharmacy services; *"the NHS isn't really helping build those relations as certain services can build barriers and conflict"* (P1). Another suggestion was that undergraduate placements can also help interprofessional engagement in the future; *"put on placement in a variety of sort of situations, I think that would be good"* (P1).

### 3.5. Pharmacists having good interpersonal skills

One participant stressed the importance of the pharmacists' own communication skills to ensure that they provide a solution to the HCP when posing a problem and empathising with other HCPs; *"You have you have a degree of empathy there, to understand that you don't really want to pose someone another problem, you know if you give someone another conundrum you really want to offer some answers as well, rather than making someone's life harder, you'll only annoy somebody"* (P1).

### 3.6. Providing a high-quality pharmacy service

Providing a high-quality pharmacy service can help interactions as it enables community nurses to be aware of the availability of products and gives the GP confidence that pharmacy can be the first port of call for any problems; *“We’ll do it (sort out the supply of medications for a prescription) the next day usually and they (nurses) appreciate that”* (P5), *“they know we provide a good service here so any problems they’ve got we tend to be their first port of call”* (P13). Certain services were described as driving the need for interprofessional communication, with for example the minor ailment service stimulating interactions with opticians and providing information to the GPs on services that their patients had used such as flu jabs and smoking cessation; *“we have access to a minor eye ailment service...there’s an optician probably 500m away from us and so the referrals end up going back and forth erm that would probably be at least daily, it’s actually quite a useful tool...I always just let them (GPs) know which patients are on it (smoking cessation), erm yeah like we speak to them nearly every day”* (P1). Additionally, the provision of ONPOS (Online Non-Prescription Ordering Service) was reported to have helped improve interprofessional relationships with community nurses; *“we take part in an enhanced service scheme called ONPOS which is about supplying dressings, but ultimately, due to those, interactions relations have built”* (P1).

Participants believed that by providing services this shares the workload between HCPs; *“we have been able to share our workload because we do the smoking service here and flu, they’re aware of it, they’re able to send people to us and that takes the load off them”* (P2). This can therefore help take pressure of HCPs, *“like doing the travel clinic to take pressure off nurses”* (P7), however some participants commented that some HCPs don’t always appreciate this; *“they don’t appreciate that pharmacists are doing it to take the pressure off them not to just take their money”* (P7). P11 also believes *“offloading services to pharmacy”* would free up GP time further.

#### **5.3.2.3.4. Co-location with HCPs and interprofessional interactions**

The impact of co-location with other HCPs on participants’ IPIs was separated into two subthemes:

- 4.1. Not being co-located alongside HCPs has a negative effect on interactions
- 4.2. Being co-located alongside HCPs benefits interactions

#### 4.1. Not being co-located alongside HCPs has a negative effect on interactions

Participants indicated being remote from other HCPs reduces the frequency of interaction, this was particularly evident from P10's statement regarding dentists; *"(interactions are) more difficult because they're spread out so far away, there isn't a dentist really that near to here so it would be a case of we don't deal with them very often so we're not familiar with the way they work and things like that really"*. In some cases, when pharmacists were not co-located alongside HCPs this meant IPIs became non-existent, something that P12 found occurred with the community nurse; *"there aren't any upstairs at the moment so I don't have any interaction"* (P12). Additionally, not being co-located was also seen to impact on the focus of interactions with P1 stating that *"other GPs that are perhaps further away, the interactions will solely involve making prescription interventions"* compared to more in-depth clinical conversations about specific patients with those co-located. P9 also felt that within community practice *"it's not like the hospital, so you're not working as a massive multidisciplinary team within one roof er so when you are making calls to these different community (HCPs) whether it's the GP or dentist you're getting straight to the point, certain issue and you'll deal with it and that's it"*. This impact of physical separation on interaction was reiterated by P11 who felt that within community pharmacy they are *"quite ostracised, we don't really have any interactions with other professionals"*.

#### 4.2. Being co-located alongside HCPs benefits interactions

In contrast, being co-located alongside HCPs was reported to have a positive effect on IPIs. For example, P1 highlighted the advantage of the hospital environment in encouraging collaboration, *"in a hospital environment that (IPIs) is probably encouraged because that is just there, everybody is on the ward together"*. This co-location helps build relationships and makes interactions more accessible as pharmacists can directly approach the HCPs; *"I think in a location like there where everyone's next door to each other its easy isn't it because you all know each other and speak to each other"* (P1), *"well obviously it's just next door so if I've got a query I'll pop in and we can nip in between appointments or erm they will quite often pop in"* (P13). In addition, P2, described how a GP practice was *"literally like 100m down the road"* and found this to be a real benefit; *"I am so much closer to the GPs and the nurses because I can see them whereas the other ones I don't physically see them it's just a phone conversation and I think that makes a difference"*. They also felt that being further away would be a barrier to interactions; *"I think if they were further away it would be much harder"*.

As discussed in section 5.3.2.2.4 the impact of co-location on the mode of interactions was clear, with those co-located with GPs stating they interact more often in a face-to-face manner compared with those detached from other HCPs where phone communication was the sole mode of interaction; *“I’ll go and pop and see them next door just because it’s easier to do it face to face”* (P15), *“the doctor will then come down and talk to us”* (P12). However, although face-to-face interactions was seen as preferable this was also dependent on *“how busy we are here”* (P15), and that it *“depends on the doctor”* as to whether the interaction is face-to-face or over the phone (P12). In addition, P7, who was co-located with GPs, found that with pressure on pharmacy reaching *“breaking point”* they did not have time to wait to interact with GPs face-to-face and therefore would ring in a similar fashion to those pharmacies not co-located; *“if we want to speak to them we phone them because otherwise we’re standing outside their room waiting to see them and it’s too busy for me to go and stand there for 5 or 10 minutes”*. Similarly, P8 stated how they always interacted by phone even though the GP practice was only a *“5 minute walk away”*, and P1 felt that the distance between themselves and the opticians would have no bearing on interactions.

### 5.3.2.3.5. Learning from and educating about interprofessional interactions

Learning from and educating about IPIs was separated into three subthemes:

- 5.1. Pharmacists can learn from other HCPs
- 5.2. Pharmacists don’t learn from all HCPs
- 5.3. Benefits of and suggestions for IPE in pharmacy

#### 5.1. Pharmacists can learn from other HCPs

A number of participants suggested there is lots to learn from other HCPs with P13 stating they learnt something *“most days”* and P1 believing *“you should view any interaction as a learning process”*. Ten of the twelve participants reported learning about specific topics from doctors including; unusual doses, alternative/new products, medical procedures and local guidelines. GPs broad knowledge base was seen to help pharmacists learning, however the in-depth knowledge of specialised HCPs was also seen to be of benefit; *“their (midwives) skills are so set as such a small range so they give you so much information just for that range whereas GP/community pharmacist we’re kind of covering a lot of stuff, maybe in not quite as much depth”* (P7). Although community nurses were seen as slightly more specialised with learning often focused on dressings, wounds and vaccinations, it was also felt that nurses helped educate the pharmacist about each patient’s conditions and needs. Other HCPs where participants reported specific specialised learning was from hospital doctors

regarding new medications, dentists regarding off-license toothpaste in children, and health visitors and midwives regarding baby milk and reflux.

### 5.2. Pharmacists don't learn from all HCPs

A number of participants expressed that they hadn't learnt anything from particular HCPs including GPs (n=2), community nurses (n=4), dentists (n=6) and opticians (n=1). One participant, P9, was very strong in their belief that they did not learn from any HCPs as interactions were *"straight to the point"* and *"to learn something you would go out and learn it yourself, the information is readily available on the internet or any other resources so you can learn it yourself"*. Time constraints were also seen to be a contributing factor in not learning from HCPs; *"just finding the time to do it which is really difficult"* (P7). However, a number of participants (n=7) suggested that although they may not have learnt anything directly from HCPs, interactions helped identify their own learning needs; *"they don't teach me things but they give me things that I have to learn"* (P7). This is particularly evident when the HCP has a query and the pharmacist is unsure of the answer; *"I didn't really know much about it but after looking I learnt a bit about it"* (P3), *"it's normally queries that I get from them and kind of teach yourself then go back to them with what the answer is"* (P11).

### 5.3. Benefits of and suggestions for IPE in pharmacy

From participants' experiences of IPE they found it *"useful"* (P2), *"quite important"* (P3), *"valuable"* (P7) and found that, along with peers taking part, the IPE sessions experienced were *"good"* (P11). A number of benefits related to IPE were articulated by the participants including reducing barriers between HCPs and increasing the understanding of HCP roles; *"(IPE was conducted) so that people understood each other's roles a bit better and their limitations on what they could do so that you would have a bit more of an understanding on what you could ask or what they wouldn't be able to do"* (P12). Improving the understanding of one another's roles was also the most frequently suggested topic for IPE sessions (10/14 participants), with P11 believing this could also help increase the respect HCPs, in particular doctors, have for the pharmacists; *"a lot of them (doctors) are newly qualified they don't really know what pharmacists do so could be something to try and get them to work closer together... doctors would maybe have a little bit more respect for pharmacists (then)"*.

Doctors and nurses represented the two HCPs that participants suggested IPE should be undertaken with and many participants believed that IPE with pharmacists, doctors and nurses together would be beneficial. Beyond improving understanding of HCP roles, a number of additional suggestions for themes for IPE with doctors were provided including

managing patients, counseling patients (eg. surrounding the management of depression and related medications), understanding GP specific prescribing patterns, drug/product advice, understanding the information/knowledge doctors have, OTC diagnosis skills, common doctor issues, doctors' terminology/abbreviations and getting information from doctors. IPE with nurses was thought to also help pharmacists "*appreciate kind of the level of their learning that they've had they then can appreciate how to use pharmacists*" (P7) and could be focused on pharmacists showing nurses where drug information comes from. Other broader themes for IPE were suggested with P14 feeling that dealing with difficult HCPs (GPs and receptionists in this case) and management skills could also be helpful, with P13 believing that asthma could be a topic that may link multiple HCPs. A number of participants also suggested that more IPE is needed, believing it should run through the MPharm programme and continue once qualified; "*The (IPE) courses that I had on my undergraduate course were really good anyway... I think maybe more of them... probably from an earlier stage as well so from first year all the way to fourth*" (P11).

#### **5.3.2.3.6. Impact of the receptionist on interprofessional interactions**

One healthcare team member who was frequently mentioned throughout the interviews was the GP receptionist. Receptionists are part of the wider multidisciplinary team and play a vital role in the interactions taking place between pharmacists and other HCPs (predominantly those within the GP and dental practices). As such, the impact of the receptionist on IPIs was explored and four subthemes emerged:

- 6.1. Receptionists' broker role in HCP interactions
- 6.2. Receptionists' broker role as a barrier to interactions
- 6.3. Receptionists being helpful in resolving patient issues
- 6.4. Need for a good relationship with receptionists

##### 6.1. Receptionists' broker role in HCP interactions

Receptionist were seen to have a large impact on HCP interactions due to their 'broker' role (Burt, 2005) where they are the first person the pharmacist spoke to when trying to engage with HCPs, "*it will probably go through to the receptionist first then to the GP*" (P12), "*usually you speak to a receptionist first*" (P1). Receptionists then either direct the participant through to the relevant HCP, "*the receptionist are quite open to getting them (the HCP) to come and talk to you*" (P11), or they pass a message on to the HCP and potentially relay that information back to the pharmacist; "*they write down the details on a message to the doctor... and if they (HCP) feel they need to contact me then they will or if they feel that the receptionist can do it then they'll write a message back which I can then get that information from them*"

(P8). A number of participants recognised the receptionist's broker role is there to protect the HCP; *"they have to protect that the GP is on a very structured day, it's very busy, it depends on the seriousness and nature of your problem (as to whether you will be put through to the GP)"* (P1).

### 6.2. Receptionists' broker role as a barrier to interactions

Although many participants acknowledged the broker role of the receptionist, both P4 and P6 saw the receptionist as the *"main barrier"* to HCP interactions. These participants indicated that the receptionists they interact with believe they can directly solve issues and are therefore reticent to connect the pharmacist with the HCP. This was acknowledged by a number of other participants; *"in some surgeries the receptionists make it very difficult... I feel that sometimes the receptionist are the barrier, they will try to do anything they can to you know, just get rid of you basically"* (P3), *"the receptionists don't want to put you through so they'll try and find a way of not giving you access to them"* (P11) *"the receptionist will act as a go-between and I'd say it's probably 1 in 20... 1 in 10 phone calls to the GP where I'll speak directly to them"* (P4). P11 also felt it was only if they were unhappy with a response from the receptionist that they would continue until they are put through to the HCP; *"with the receptionist its only if I'm not really happy with what they've said that I'll request to go through"*. A number of participants echoed this, with P6 feeling that you have to persist in order to get through to the HCP; *"sometimes you eventually get through but they do try and answer it and kind of end it there but you have to persist with it and say you actually want to speak to the GP"*. P1 also felt that although the receptionist tries to help they rang to speak to the HCP and not the receptionist, *"sometimes it is difficult to get through the receptionist and they'll try and answer the question by looking at the patients notes but generally if I'm ringing to speak to a doctor, I want to speak to a doctor"*, which can lead to frustration particularly as some participants felt information exchange is often slower with the receptionist than when speaking directly to the HCP; *"it's a lot more of a faster exchange conversation (with the HCP) than, you know, when it is with a receptionist because you don't have to explain anything"* (P4).

A number of participants felt that receptionists restrict their access to HCPs as they believe that pharmacists are just contacting the GP in order to increase their own profit; *"I think they're a bit skeptical of us perhaps in thinking that we're just trying to get more revenue and more scripts"* (P4), *"I think that sometimes they think 'oh they're just trying to get a profit'"* (P3). These issues could potentially result from a lack of awareness of the pharmacists' role by the receptionist, with two participants stating it would be beneficial to train the

receptionist on the role of the pharmacists; *“maybe the receptionist training would be the best thing for it but that’s generally the only barrier that we have”* (P4), *“training GP receptionists in terms of them knowing what a pharmacist does”* (P3).

### 6.3. Receptionists helpful in resolving patient issues

Participants found receptionists to be helpful in a number of ways including dealing with prescription queries (which involved discussions about quantity, dosing and formulation issues), especially when the HCP is unavailable; *“normally they’ll deal with it... if it’s dose query they’ve (GPs) normally written in the notes why it is that or if it’s from a consultant”* (P11). This meant that engaging with the receptionists could lead to faster resolution of issues; *“(the) majority of the time we will speak to the receptionists at the surgery because they can deal with it quicker... I don’t need to speak to the GP we have a relationship... they (GPs) don’t have time to deal with that and we don’t have time to wait for them to call us back so we deal with the receptionists there they get the issues sorted for us most of the time”* (P9). The receptionist was also seen to contact the pharmacists on behalf of the HCP in order to check dose queries (GP) and drug histories (dental). In contrast to a number of participants who felt that receptionists were barriers to IPIs (see theme 6.2) some found that those receptionists that did understand the role of the pharmacist were helpful in facilitating interactions with HCPs and solving issues; *“in the surgery nearest us the receptionist is very good and they don’t mind us speaking to the doctors or getting us through, they realise that we do have a vital part to play and we are trying to help and solve problems and things like that”* (P3).

### 6.4. Need for a good relationship with receptionists

A number of participants recognised the benefits in having a good relationship with receptionists, *“it is about the relationship you have with their support staff as well”* (P1). Participants have also suggested that by having shared understanding of roles and a good relationship this helps make interactions less formal and ensures the receptionist is more willing to help; *“I think the fact that we have built up such a good relationship with the receptionist in there I think that this makes it easier and they sort of believe, they trust what I say so for example if I send someone in because I think they need to be seen by a doctor, they will try and fit them in because I’ve said that they need to go in so, we’ve got quite a good relationship in that aspect so that makes it easier”* (P10).

## 5.4. Discussion

In recent years the pressure on primary and secondary care services within the UK has increased due to a number of factors but particularly a growing aging population (Bienkowska-Gibbs et al., 2015) resulting in a transition for community pharmacists away from the provision of traditional supply type services such as repeat dispensing to include more clinically focused services and take greater advantage of pharmacists' unique skillset as experts in medicines (Dobson et al., 2006; Department of Health, 2010; Carter, 2016). As a consequence community pharmacists are increasingly required to interprofessionally integrate and collaborate (Department of Health, 2010; Centre for Workforce Intelligence, 2014; NHS England, 2014a; Royal Pharmaceutical Society, 2015), however, there is currently a paucity of literature exploring the specific IPIs that community pharmacists engage in during their practice, making it challenging to understand and develop pharmacists' interprofessional skills. This study therefore aimed to identify those HCPs that community pharmacists in Wales interact with and to explore the nature of these interactions. A mixed methods approach was adopted using both questionnaires and semi-structured interviews helping triangulate the data. Together these methodological approaches identified the HCPs community pharmacists work with most frequently (i.e. the questionnaire identified the quantity of interactions, with primary care doctors, nurses and dentists identified as the most frequent) and explored the nature of these IPIs (i.e. the interviews explored the quality of interactions alongside the quantity helping to triangulate data) including any facilitators or barriers, of which the value of IPE in aiding these was determined. The initial questionnaire achieved a high response rate from the 716 Welsh community pharmacies across all seven health boards ( $61.9\% \pm 4.9$ ) providing confidence in the generalisability of the results. Following the questionnaire, 14 semi-structured interviews were conducted and whilst this was not exhaustive this sample represented a cross section of community pharmacists, there was strong repetition of data and themes, and the study aims had been achieved (Bowen, 2008; King and Horrocks, 2010a; Malterud et al., 2015).

. In this current study, many participants expressed the belief that interprofessional working can help achieve a greater understanding of the patient and their condition and was said to lead to the provision of quicker, safer and more patient oriented care, reflecting the national and international focus of interprofessional collaboration (World Health Organisation, 2010; Department of Health, 2013a) and the recent NHS inquiries (Francis, 2013; Andrews and Butler, 2014; Kirkup, 2015). This data also reflected the findings of West

et al. (2013) who compiled and presented the results from the extensive data collected within the NHS staff survey undertaken annually between 2006 and 2009 (e.g. the response in the 2009 survey represented 390 separate trusts and 154,726 individual employees). This study identified that NHS staff in their own right have recognised the positive impact of engaging in interprofessional teamwork had on patient care, with participants expressing the belief that providing successful interprofessional care could ultimately reduce the likelihood of patient mortality. Despite the drivers for interprofessional collaboration (see chapter 2 and Reeves et al. (2017)) there is little high-quality evidence which shows that patient care is enhanced through effective interprofessional collaboration.

Participants within this study stated that their interactions with HCPs helped to: improve the exchange of knowledge, gain an understanding of the ways other HCPs think and reinforce the pharmacist's own role within the healthcare team. These are factors that have been previously identified within the literature, and are indeed are commonly set as learning outcomes for IPE (Greiner and Knebel, 2003; Freeth et al., 2008; Thistlethwaite, 2012; Carpenter and Dickinson, 2014; Barr et al., 2017). Of note, participants also felt that IPIs enabled them to build relationships which helped them to feel more comfortable/confident in approaching HCPs with queries or problems.

Within primary care, the GP practice is seen as the central hub of patient care (Royal College of General Practitioners, 2014), this was reflected in both the questionnaire and interview data with participants working most frequently with HCPs based in this area. Interestingly, previous studies by Van et al. (2011) and Bradley (2012) found that community pharmacists interactions with GPs were infrequent. Whilst the definition of infrequent is subjective, community pharmacists within the study presented here differed as they reported that interactions with GPs were more frequent than with any other profession, with a significant number of respondents to the questionnaire indicating that they interacted with GPs on a daily basis. This is perhaps a consequence of the drive to better utilise community pharmacists within the interprofessional team to reduce the demand on GP practices (British Medical Association, 2014), possibly indicating that there has at least been some 'culture change' in the collaborative practice between pharmacists and GPs which was desired by the Royal Pharmaceutical Society and Royal College of General Practitioners (2011).

Participants in the semi-structured interviews reported a variety of reasons for their interactions with GPs. In total, twenty different clinical and practical reasons for IPIs were

elucidated from the interviews, with clinical interactions often collaborative and related to the resolution of prescription issues and discussions about the patients' medications, and practical issues generally involving the exchange of information, such as informing GPs of pharmacy services used by the patient or stock issues. These findings mirrored that of Van et al. (2011), which showed, through the use of qualitative interviews with both GPs and pharmacists in Australia, that interactions varied between administrative issues with the dispensing process and clinical discussions relating to areas such as changes to drug therapies and medication adherence. . Furthermore, the collaborative IPIs described by participants in this current study based on clinical queries (which accounted for more than half of interactions reported) were reported to benefit interprofessional relationships, with participants stating that when pharmacists and GPs had regular communication about clinical issues this helped build rapport and trust which in turn helped them work more effectively together. In addition, the interview data also showed that GPs were comfortable in approaching pharmacists about issues, however pharmacists on the whole recognised that they more frequently initiated interactions. This showed similarities to a study by Snyder et al. (2010), who used mixed methods to explore pharmacist-GP interactions in the USA, and found that pharmacists tended to be the professional whom normally initiated the interaction.

In addition to collaborating with GPs, the Primary Care Workforce Commission (2015) indicated that in order for community pharmacists to provide the best advice and care in complex areas of medication management they should do so in collaboration with all members of the general practice team including community nurses, midwives, health visitors, managers and administrators (e.g. receptionists). In both the questionnaire and interview elements of this study, it was clear that community pharmacists heavily engage with community nurses (4/5 community pharmacists interacting at least once a month). Of note, this contrasted findings from While et al. (2005) who used a questionnaire to explore interactions between UK community pharmacists and nurses. Whilst While reported that pharmacists and nurses ultimately had an underlying willingness to engage, their interactions were said to be limited. The findings in this current study therefore suggest in Wales at least the workforce has moved on and collaborative practice between these professions has advanced since While's 2005 study.

Interactions with community nurses were identified to be both clinical and practical in nature. Once again those of a clinical nature tended to be collaborative and surrounded areas such as dressings, wound management, patient discussions, vaccinations and

medication advice as well as dose confirmation and prescribing advice. These clinical interactions form the basis for those more practical 'information exchange' interactions such as stock and supply of medicines, informing the nurse when the pharmacist had undertaken a flu jab, and utilising the nurses prescribing capacity when the GP was not available. Whilst the topic of interaction did vary slightly perhaps due to the more recent advancement in pharmacist roles (i.e. the incorporation of advanced and enhanced pharmacist services), these results ultimately aligned with further findings from While et al. (2005) who identified that pharmacist-nurse interactions primarily focused on the nurse's role in prescribing, protocol development, or resolving dispensing issues.

Findings from the questionnaires employed in this study indicated that community pharmacists interact fairly frequently with health visitors and midwives based in the GP practices. These professionals were discussed by participants during interviews on a number of occasions, with interactions primarily initiated by pharmacists asking for advice surrounding paediatric assessment or treatment, leading to collaborative discussions about the care of patients.

Within primary care, HCPs can also be based outside of GP practices in their own distinct premises. This is often the case with dentists, a profession which was observed to have high levels of engagement with community pharmacists (identified as the third most frequently interacted with HCP). Dentists were characterised by participants as having poor prescribing skills more often than any other profession. As such community pharmacists had to work collaboratively with them to ensure the medicines supplied to patients were appropriate. Participants also indicated that many dentists continue to issue hand written prescriptions that were often illegible prompting some to suggest transition to electronic prescriptions was needed. Opticians are also another profession who are located in distinct premises, however interactions were reported to be infrequent and often indirect (i.e. through the use of referral cards).

In this study three-fifths of pharmacists reported that they interacted with care home staff at least once a month. The nature of these IPIs was not generally addressed by participants in the interviews, with just one participant stating that interactions with these staff were related to in-depth medical queries due to the large number of prescriptions they dealt with from this area, however these interactions could be explained by the Royal Pharmaceutical Society (2016) recent belief that by making pharmacists a central part of the care home

team patients' medicines could be better optimised and managed to reduce harm, inappropriate medicine use and waste.

As well as the drive to better integrate HCPs in the primary care setting, there has been considerable work undertaken to 'join up' health and social care services (Barr et al., 1999; Meads and Ashcroft, 2005; Reeves et al., 2010b; Welsh Assembly Government, 2011a), with the NHS Future Forum (June 2011) producing a series of reports expressing the need for greater collaborative working across these areas (NHS Future Forum, 2011a; NHS Future Forum, 2011b). This Forum particularly highlighted how the current model of health and social care discouraged this practice, leading the authors to state how the "health service now needs to drive integration in a way that has simply never happened to date" (pg. 7) (NHS Future Forum, 2011a), a notion which was consolidated when the Health and Social Care Act 2012 was released by the Department of Health (2012) which stated the imperative need for greater collaboration throughout health, education and social care and across both primary and secondary care. The need for close ties between health and social care was reinforced within this current study as interview participants felt that interacting with social workers was important within practice and was viewed as a 'big thing'. One key reason for this was because pharmacists believed many social workers, much like themselves, had good relationships with patients and were valuable sources of information about patients. This led to collaborative interactions related to patient compliance, medications changes (especially when discharged from hospital), supervised consumption of medications in substance misuse patients and the wider holistic care of the patient beyond health matters. Whilst interview participants indicated a clear benefit in interactions with social workers, the questionnaire element of the study revealed that only a quarter of pharmacists interact with social workers on a monthly basis which suggests that the integration of health and social care, at least in a pharmacy context, is far from complete.

Whilst it is recognised that greater levels of information transfer between HCPs across care settings could help reduce hospital readmission (Ham et al., 2010), community pharmacists IPIs with professionals based within secondary care were reported to be relatively infrequent in this current study. However, whilst community pharmacists reported low levels of interaction with the majority of secondary care HCPs, a significant number did indicate that they interact with hospital doctors, pharmacists and nurses at least once a month. Unsurprisingly, the interactions were commonly related to patient admissions to or discharge from hospital. Primarily, the interactions were associated with ensuring adequate

transfer of information from secondary to primary care rather than full collaborative engagement of HCPs. Such information sharing is thought to help deliver the NHS aim of bridging the gap across care sectors, improving the flow of patient information and ultimately achieving a greater level of continuity of care for patients (NHS England, 2014b; Primary Care Workforce Commission, 2015).

In order to fully utilise community pharmacists' potential, UK government agencies are supporting community pharmacists to deliver an expanding range of patient services (Mossialos et al., 2015). As a byproduct, these services also aim to reduce the strain on other areas of practice (Centre for Workforce Intelligence, 2014). In interviews, participants supported this aim stating that new services can relieve pressure on other HCPs and free up time in order for HCPs to potentially engage in more interprofessional working. However, although there is an intention to provide services such as MURs, DMRs, minor ailment schemes, etc. in an interprofessional manner, there is little evidence to suggest that this is occurring. Bradley (2012) found that on the whole pharmacy services "did not require frequent, if any, contact with GPs or GP practices" (pg. 132). Similarly, Van et al. (2011) found that although the provision of services had some positive impact on interactions between GPs and pharmacists they did not always lead to interprofessional engagement. Seemingly, this current study, for the most part, reinforced these findings, with little mention by participants in interviews that the provision of new services had resulted in an increase in interprofessional interactions. For example, in an analysis that compared the frequency of interactions with HCPs based on whether the pharmacy provided discharge medicines review (DMR) service showed that the service had little impact on IPIs, with the only significant increase in interactions with hospital pharmacists. This is surprising as the DMR service aims to improve the transfer between care sectors (Royal Pharmaceutical Society Wales, 2015) and provide more integrated interprofessional care to ultimately reduce hospital admissions (Ham et al., 2010). As such the service should be a partnership between community pharmacists, GPs, secondary care prescribers and pharmacists. In a review of the DMR service conducted by Hodson et al. (2014), the authors similarly concluded that greater levels of interprofessional communication between the hospital, community pharmacist and GP were needed and indeed it was not uncommon for GPs to be unfamiliar with the service. One proposed solution that may help to facilitate information transfer between care settings during discharge is electronic/online DMRs and discharge advice letters (cf paper based). In a study conducted by Mantzourani et al. (2017), 17 pharmacists were interviewed to assess their opinions on a pilot version of NHS Wales' online Choose Pharmacy platform. The study found that interviewees perceived the online

method to streamline the completion of the DMR and improved continuity of care between primary and secondary sectors.

Although the impact of other Advanced services such as medicines use reviews (MURs) on IPIs could not be determined, previous research would suggest that there is little evidence that pharmacists and other HCPs (such as GPs) engage interprofessionally in the delivery of this service. In a qualitative study involving ten weeks of ethnographic observations and patient interviews about the MUR service in two English community pharmacies, Latif et al. found that there was little evidence suggesting that pharmacists and GPs were working collaboratively or communicating outcomes resulting from MURs and felt that until this interprofessional culture improves it is unlikely that extended pharmacy services will reach their full potential (Latif et al., 2013a; Latif et al., 2013b). Indeed, one pharmacist participating in the interviews described in this study indicated that although the provision of the MUR service could possibly lead to more opportunities for interprofessional interactions, GPs often didn't read the MUR feedback provided by pharmacists resulting in a potential missed opportunity for collaboration and the improvement of patient care. Although the provision of services was not generally seen to impact interprofessional interactions, it was still perceived by participants that the delivery of high quality clinical services and advice to HCPs would increase the likelihood interprofessional interactions. In a model for improving relationships between pharmacists and doctors developed by McDonough and Doucette (2001) this was similarly found to be of importance when developing collaborative working relationships. The authors indicated that HCPs begin to develop expectations surrounding pharmacists' abilities and competence over time, highlighting the importance of providing good services to prompt future interactions and utilise each other's skills and build relationships.

The Welsh Government have recently introduced the '2018/19 Collaborative Working Scheme' (Community Pharmacy Wales, 2018) which aims to develop and improve community pharmacists' collaborative relationships with GPs and other HCPs. This scheme was introduced in October 2017 and provides a monetary incentive (up to £1500) for community pharmacists to engage with primary care clusters in a number of specified areas. Whilst this helps encourage community pharmacists' collaborative engagement in areas such as promotion of services, only one of the schemes requires pharmacists to actively undertake interprofessional engagement (attending a primary care cluster meeting). Too often such schemes promote transactional relationships rather than embedding true interprofessional care.

With the role of the community pharmacist expanding this has meant that wider use of the pharmacy support staff is needed in order to move pharmacists away from dispensing roles and allow them to engage in more clinical tasks which utilise their skill set (Primary Care Workforce Commission, 2015). This wider utilisation of pharmacy staff was evident within the questionnaire element of this study and pharmacists were seen to interact with pharmacy team members more than any other HCPs or HCTMs on a daily basis. Statistical analysis indicated that companies that operate multiple pharmacies (company has more than 6 pharmacies) employed significantly more staff than independent pharmacies, a finding also reported by the General Pharmaceutical Council (2018b). In order to transition community pharmacists from the traditional supply role it may be necessary to encourage or indeed smaller independent groups to enhance the pharmacy team.

It was interesting to note that few community pharmacists reported that they interact with any HCP on a daily basis. This mirrors the findings of a mail questionnaire study sent to community pharmacists across Canada which explored their interprofessional experiences in practice and found that although pharmacists expressed willingness to engage in collaborative interprofessional working, actual rates of participation remains low (Dobson et al., 2006). In addition, in an observational study of community pharmacists' daily roles across ten English pharmacies conducted by Davies et al. (2014), the authors found that less than 5% of pharmacists' time was related to 'health-related communication', the definition of which included IPIs as well as other activities that involved communication.

One of the major barriers to interprofessional engagement cited by a number of participants in this current study was an apparent lack of time for interactions. The expanding role of the community pharmacist meant that a number of participants felt they had additional pressure and time constraints on their daily scope of practice leaving little time to engage in IPIs. This barrier has previously been recognised for community pharmacists within the literature, with Van et al. (2011) indicating that nearly all pharmacists and GPs in their study cited a lack of time as the main reason for not working together, with several pharmacists noting that GPs were not always easily accessible. The interviews in this current study support these findings with participants suggesting that of all HCPs, the GPs time was most stretched, a feature similarly highlighted by the 'your GP cares' movement (British Medical Association, 2014), and were also stated to be the most challenging HCP to access. Bradley (2012) also explored community pharmacist-GP relationships and found that these time pressures resulted in reduced interprofessional working, particularly when interviewees

felt the benefits of interprofessional interactions did not outweigh the time and effort required. These challenges were reinforced by interview participants within this study, with many stating that the lack of availability of the GP often resulted in delays in resolution of issues, with others participants indicating that the time needed to conduct interprofessional interactions could result in a loss of business. These issues were further compounded with some pharmacists feeling reluctant to interrupt GPs, something which has been termed by Bradley (2012) as the 'pharmacist-GP game' where pharmacists tactically manage and avoid potential conflict in GP interactions.

One method some HCPs (i.e. GPs, dentists and hospital doctors) use to protect their time is through the receptionist's 'broker' role (Burt, 2005). This role gives the receptionist the ability to facilitate or impede information flow to community pharmacy (Swinglehurst et al., 2011), perhaps explaining why questionnaire respondents had more frequent interactions with receptionists than with any HCP. Although a number of participants recognised the importance of the receptionist's role in protecting HCP time and felt that receptionists can help deal with a number of queries, many participants found this a frustrating and slow process and indeed some participants cited the receptionist as the main barrier to interactions. Although there were a number of reasons for this, some participants felt that receptionists continuously tried to 'get rid of the pharmacist' primarily because they didn't understand the pharmacist's role and felt they were just trying to get money rather than aiding the patient. This frustration was similarly echoed by interviewees within the Bradley (2012) study where the authors found that this 'broker' role often resulted in less direct communication with HCPs, with many also questioning the ability of receptionists to make appropriate judgements relating to the need for pharmacists to access the HCP.

Having more direct access to HCPs was something Van et al. (2011) found improved collaboration and helped develop interprofessional relationships, a finding reinforced by interviewees within this current study. One technique the Primary Care Workforce Commission (2015) believes could improve interprofessional integration is through co-location of HCPs within the same premises. Unlike in secondary care, where the full spectrum of HCPs are situated within the same building, within primary care, different professional groups tend to be housed in distinct premises (e.g. the community pharmacy vs. the GP practice). In a literature review of factors which foster interprofessional interactions in primary care, Xyrichis and Lowton (2008) recognised that having HCPs physically co-located alongside one another was vital for achieving successful interprofessional teamworking. In recent years, in an attempt to combat the general

professional separation seen within primary care, there has been a drive to establish 'health centres' where a wider clinical offering is delivered by an interprofessional team (Vincent et al., 2011). Whilst this is not a new concept, the implementation of health centres has not gained the desired traction and therefore NHS England (2014b), the Primary Care Workforce Commission (2015) and the Royal Pharmaceutical Society (2017b) have all recently emphasised the need to physically integrate HCPs including community pharmacists. This lack of physical co-location within primary care was clear within the questionnaire data with less than a quarter of respondents indicating that the community pharmacy in which they practised was attached to another healthcare provider. For those that were co-located, the majority were attached to GP practices (n=77/101).

The benefit of co-locating HCPs is supported by the data in this study. Indeed, pharmacists whose working environments were co-located with a GP practice reported significantly higher levels of interaction with HCPs similarly co-located within the practice (namely GPs, community nurses, midwives and health visitors). This represents the first data which identified a positive impact of co-location on frequency of interprofessional interactions and has been published within the *Journal of Interprofessional Care* (see Appendix L for abstract) (Jenkins et al., 2016). These quantitative findings were supported by interview data with those participants co-located with other HCPs indicating they had increased frequency of interactions. These participants felt that by increasing the number of interactions through co-location this also increased the level of confidence each HCP had in each other's professional and clinical competence, something McDonough and Doucette (2001) also acknowledged in their review of pharmacist-GP collaborative relationships. In addition, interviewees recognised a number of other interprofessional benefits to being co-located alongside other HCPs including having increased opportunity to develop relationships with HCPs, the removal of the barrier of the receptionist as they could directly interact face-to-face with HCPs, having easier access to HCPs which encouraged collaboration (especially with HCPs they wouldn't generally engage with otherwise) and feeling more incorporated into the healthcare team thus reducing the feeling of professional isolation reported by a number of interview participants based in distinct premises.

This study found that the majority of community pharmacists' interprofessional interactions take place over the phone. Co-location was however reported to promote increased levels of face-to-face interactions with HCPs. This has been found to help build relationships and improve collaboration between pharmacists and other HCPs (Brock and Doucette, 2004; Snyder et al., 2010). These findings were reinforced by interview

participants who believed that not engaging face-to-face or knowing the HCP personally negatively impacted on both the frequency of interaction and the nature of the interaction (making interactions shorter and more limited). The data found within the interviews in combination with the published frequency data (Jenkins et al., 2016) therefore strongly supports the recent drive to move community pharmacists from separate distinct premises into larger interprofessional health centres (Primary Care Workforce Commission, 2015; Royal Pharmaceutical Society, 2017b).

Of course, culture and norms influence interprofessional practice (Hall, 2005) and therefore co-location should not be seen as the panacea for increasing interactions. Indeed, some interview participants stated that that co-location was not essential for interactions with some HCPs. This was made particularly evident by one participant who stated that their co-location alongside opticians had no impact on interactions as they still interacted indirectly via referral cards. Furthermore, another participant who was co-located with GPs found that even with the apparent close-proximity engaging with GPs face-to-face was challenging and rarely occurred due to time constraints. Another interesting finding was that face-to-face interactions with community nurses were seen to occur irrespective of co-location, with participants stating that nurses would often make the point of coming into the pharmacy to drop off or collect patient prescriptions, however this did occur less frequently than when pharmacists were co-located alongside this profession.

One way the Welsh Assembly Government (2015) (and also NHS England (2014b)) aimed to reduce interprofessional segregation and further utilise the skills and knowledge of pharmacists was rather than associating community pharmacies with GP practices, to create a new role for pharmacists directly in the GP practice. These pharmacists are commonly referred to as primary care or GP practice pharmacists. These pharmacists directly support the provision of pharmaceutical care out of the GP practice and are not involved in the supply of medicines. To do this GP practice pharmacists undertake patient consultations to monitor and rationalise patients repeat prescriptions, improve medication adherence and conduct specialist reviews (particularly if they are prescribers) to optimise patients medications in certain areas (i.e. anticoagulation, diabetes, etc.) (Primary Care Workforce Commission, 2015). It seems that this role is starting to become embedded within GP practices in Wales with nearly two-thirds of community pharmacists surveyed in this study interacting with GP practice pharmacists at least once a month. Whilst the Primary Care Workforce Commission (2015) and findings from this study suggest that by co-locating pharmacists within GP practices this can help maximise IPIs (Jenkins et al.,

2016), there is a paucity of literature focused on the interprofessional role of GP practice pharmacists and further exploration in this area is needed.

Access to some HCPs, particularly those in secondary care and those with no physical base, was seen by participants as a particular barrier. With most interactions reported to be by phone or fax, finding the correct contact number for the appropriate HCP was highlighted as a real challenge. Some methods suggested to overcome this included creating a central, dynamic and comprehensive list of all HCPs, their contact details and the patients they look after, providing direct email access to one another or having functional call back systems. Another method suggested was the implementation of regular interprofessional meetings with HCPs. This method has previously been cited within the literature with Snyder et al. (2010) suggesting that face-to-face meetings are important in establishing and maintaining communication with HCPs, and McDonough and Doucette (2001) suggesting that having periodic face-to-face meetings could enhance personal and professional relationships. Of note, multidisciplinary meetings featuring pharmacists was a practice incentivised by the 2018/19 Collaborative Working Scheme, with community pharmacies eligible for claiming a one off payment of £500 if they demonstrated understanding of primary care cluster priorities through attendance at primary care cluster meetings (Community Pharmacy Wales, 2018).

Another challenge a number of participants faced was that some HCPs were said to be unwilling to share patient information. This was most commonly said to be an issue with GPs and receptionists and was reported to result in increased challenge in pharmacists conducting their clinical role and leaving pharmacists feeling distrusted by their HCP colleagues. One way the NHS in Wales is aiming to improve access to patient information is through the development of IT systems across primary care which will allow community pharmacists and HCPs to work more closely together and share key patient information (Primary Care Workforce Commission, 2015). The summary of care record (SCR) system currently in place throughout NHS England is analogous where an electronic summary of patients' key clinical information is available (with the patient's consent) to authorised healthcare professionals to support the provision of care. The SCR is currently in place for 96% of the English population (Pharmaceutical Services Negotiating Committee, 2018). Whilst NHS Wales (2018c) have now introduced a similar system (entitled the 'Welsh GP Record') across large areas of Wales, access is currently limited to hospital pharmacists, technicians, doctors and nurses, and although there are plans to enable community pharmacist access to this information this is yet to occur. However, when this is adopted in

the near future it is likely that community pharmacists' IPIs will be impacted. Although collaborative interactions such as resolving clinical issues with GPs and nurses are likely to continue, other interactions related to the general transfer of patient information may decrease in frequency as pharmacists will have more direct and efficient access, bypassing barriers such as the GP receptionist. With technological advances continually occurring, community pharmacists' IPIs may have to adapt to other new innovative methods of conducting interprofessional practice. A key distinction is that such advances should facilitate interprofessional collaboration.

The need to develop and nurture relationships was highlighted by all interviewees. A number of participants recognised that where they had poor relationships with other HCPs, this often resulted in a general negativity towards interactions from both parties. These poor relationships were often for a number of reasons including occasions when the pharmacists did not provide resolutions to issues resulting in friction between professionals, or due to the demands of the pharmacist resulting in them having to engage with large numbers of different HCPs making it challenging to build relationships. Participants also commented that their interprofessional relationships improved over time and recognised that being on first name terms with HCPs made interactions more comfortable, increased trust and improved communication between the HCPs. The concept that relationships build over time is not new, with both McDonough and Doucette (2001) and Brock and Doucette (2004) recognising this in interactions between community pharmacists and GPs. McDonough and Doucette (2001) also acknowledged that having good communication skills, being open, empathising and taking time to listen and engage helped improve collaborative relationships, points that were similarly raised across in the interviews discussed in this study. Interview participants also acknowledged that strong personal relationships with the receptionist made liaising less formal and enabled them to utilise their broker role to facilitate interactions rather than hinder them. This was something that was also found through social network analysis of interviews with community pharmacists which explored their interactions with GPs conducted by Bradley (2012), who described how pharmacists recognised the importance of building relationships with receptionists so that they "facilitated their queries rather than impeded them" (pg. 120).

Participants indicated that certain professional groups were easier to forge relationships with than others. For example, participants found that dentists generally accepted and trusted the pharmacists' advice and were easy to access, especially when compared to GPs.

A profession where relationships were occasionally seen to be difficult was with community nurses, with some participants feeling that nurses often believed themselves to be “above” the pharmacists, which could possibly be due to a lack of understanding of respective professional roles. Previous research has identified that professional background has a direct influence on attitudes towards interprofessional working, with Braithwaite et al. (2012) reporting that allied healthcare professions had more positive attitude towards IPIs and IPE than doctors and nurses, and Reid et al. (2006) and Chang et al. (2009) also reporting that doctors viewed interprofessional working less positively than a range of other professionals.

The lack of understanding of each other’s professional roles was seen as one of the largest barriers to interactions in this study and had a significant impact on the perceived respect received from other HCPs which has frequently been recognised as an issue in the literature (Hughes and McCann, 2003; Barrett et al., 2005; Larkin and Callaghan, 2005; Kvarnström, 2008; Baker et al., 2011; Carpenter and Dickinson, 2014). This was an issue that was particularly prominent with GPs, with participants believing that some GPs were dismissive of the community pharmacists role, with one questionnaire respondent stating that GPs saw pharmacists as ‘shopkeepers’ rather than essential healthcare providers, a term which has previously been acknowledged in a number of studies which explored community pharmacist-GP collaboration and resulted in participants within these studies believing that GPs did not value the pharmacists’ advice (Hughes and McCann, 2003; Dobson et al., 2006; Van et al., 2011; Bradley, 2012). One participant stated that this was especially prominent in community pharmacy, articulating that hospital pharmacists gain more respect from doctors. However, whilst pharmacists interviewed by Snyder et al. (2010) also recognised resistance to collaboration from doctors, they stressed that they understood that these IPIs were for the patients benefit and would therefore continue to push for communication and collaboration even when met with resistance. Poor knowledge of professional roles can also be detrimental to the patient as participants acknowledged that this can make it difficult in determining the appropriate professional to signpost patients, thus leading to possible underutilisation of HCPs who are most appropriate to address patient care needs.

In addition to embracing other professional roles, another barrier to interactions is the need for HCPs to fully embrace the collaborative models of practice proposed by the NHS and professional associations (Department of Health, 2010; Royal Pharmaceutical Society and Royal College of General Practitioners, 2011; Primary Care Workforce Commission, 2015). Ray (1998), who reviewed the practice of interprofessional working with reference to the

pharmacy profession, believes that the professional potential of pharmacists is likely to remain unfulfilled and further isolation away from other primary care HCPs could occur if pharmacists do not remove themselves from their professional silos. Although many pharmacists recognised the need for interactions, it was clear throughout the studies that work is still needed to engage more pharmacists in interprofessional practice, with more emphasis needed to make this collaborative working the norm rather than a bolt on to practice (Carpenter and Dickinson, 2014; Barr et al., 2017).

A number of interviewees expressed the benefits undertaking IPE can have on collaborative practice. For those more recent pharmacy graduates who had greater levels of IPE experience compared to pharmacists who had been qualified longer (presumably owing to the recent requirement made by the GPhC to incorporate IPE in all MPharm courses), they felt that the sessions they previously undertook were valuable and beneficial in improving their understanding and respect for other professional roles and helped the HCPs involved recognise how they could utilise one another's specific skill sets. These findings corresponded with studies by Pollard and Miers (2008) and Pollard et al. (2012) who identified that qualified HCPs who had previous undergraduate IPE experience felt better prepared for interprofessional working, had more self-awareness of their position in a team and had greater awareness of possible barriers to interactions. Participants suggested that IPE sessions should be conducted at both undergraduate and postgraduate level and should be integrated throughout all four years of the MPharm programme. Participants indicated that this repeated exposure to IPE can help enhance the natural development of interprofessional collaboration and relationships over time. It has also been recognised by Lindqvist et al. (2005), Tunstall-Pedoe et al. (2003) and Carpenter (1995) that HCP students rapidly developed strong stereotypical ideas of their own and other professions which could be detrimental to collaboration, therefore introducing IPE to the curriculum early could help prevent such stereotypes developing. In addition, by incorporating IPE across the MPharm programme this would create a spiral curriculum design (see Harden and Stamper (1999)) enabling students to progress their interprofessional skills as they navigate the programme. This could also further align schools with the MPharm programme requirements set by the General Pharmaceutical Council (2011) for both incorporation of IPE and the development of a spiral curriculum.

Participants also made suggestions relating to the IPE they would like to see conducted which included engagement with doctors and/or nurses. There were also suggestions for the focus of these sessions including the management of patients and their medications,

dealing with difficult HCPs and personal management skills. It became clear from both the findings of this study and the literature that conducting IPE with doctors and nurses particularly would be beneficial in helping remove a number of barriers identified including the negative attitudes of HCPs towards engaging in IPIs with pharmacists and the GPs' negative perception of the role of the pharmacist (Hughes and McCann, 2003; Barrett et al., 2005; Larkin and Callaghan, 2005; Reid et al., 2006; Kvarnström, 2008; Thistlethwaite and Moran, 2010; Baker et al., 2011; Braithwaite et al., 2012; Carpenter and Dickinson, 2014).

Another theme that emerged from interviews was the need to ensure that IPE is meaningful and relevant to each profession taking part, a key factor recognised elsewhere in the literature, with Barr et al. (2017) believing that if this is not achieved IPE can cause more harm than good. Whilst it was evident throughout the interviews that interprofessional interactions occurred organically even when participants had undertaken little or no training in interprofessional working, it was also clear that there was much room for improvement. In providing IPE that is relevant to the practice of community pharmacists this could help foster interprofessional interactions and relationships and ultimately increase the frequency with which they are undertaken. The delivery of formal IPE could also be valuable in developing mechanism for HCPs to learn from one another in practice given participants had mixed opinions on whether they learnt from HCPs in practice. A number of participants felt that each interprofessional interaction should be viewed as a learning opportunity and articulated that they learnt from HCPs most days. It was evident during the interviews that GPs were the profession pharmacists learnt from most often, particularly when it came to the introduction of new guidelines and treatments, followed by community nurses who taught pharmacists about dressing, wounds and vaccinations. Some participants stated that they did not learn anything from any HCPs due to time constraints in practice, however, many also recognised that even if direct learning from HCPs did not occur IPIs regularly prompted self-directed learning to react to queries or issues discussed.

Throughout this study it was evident that interactions between HCPs were varied. Some pharmacists clearly had frequent and productive engagement with a range of HCPs, whereas others had very little interprofessional interactions and tenuous relationships with other HCPs. This therefore highlights an opportunity for a range of facilitators including co-location of HCPs and the incorporation of relevant IPE to help enhance this interprofessional collaboration by developing of interprofessional relationships and improving the understanding of one another in practice.

### 5.4.1. Limitations

The mixed method approach used in this study aimed to utilise the benefits of both qualitative and quantitative methods and thus reduce the limitations of undertaking a single methodological approach (Johnson and Onwuegbuzie, 2004). However, a number of limitations remained.

Within stage one (questionnaire) although a response rate of 61.9% was achieved, a greater response rate would have been beneficial in aiding the generalisability of the data (Babbie, 2015c). In addition, as the questionnaire was used to gather participants' self-reported (perceived) frequency of interactions with other HCTMs this may have resulted in possible recall bias and thus under or over reporting compared to actual practice. This margin for error within the data is important to recognise when analysing the statistics, with the data being valuable as a guide to the variations in pharmacists' interaction frequency rather than a definitive figure.

The questionnaire tool itself may also have been limited by participants' understanding of the questions. This was particularly relevant for section A (the demographic questions), for example respondents were asked about the number of GP practices they 'regularly' worked with in a typical week, therefore the term regularly may have been perceived in a different way by respondents. This question was also based on the pharmacists' knowledge of this which may have been varied. Additionally, the terms for the locality of the pharmacy were highly descriptive (honed during piloting) and therefore respondents' perceptions of these may have varied. This may have similarly been the case surrounding the understanding of whether the pharmacy was 'directly attached' to another healthcare provider. Furthermore, whilst the term 'interaction' was broadly defined as any communication pharmacists had with HCPs participants may have interpreted this differently and possibly interpreted this as clinical interactions rather than other more general communication. The interviews were later used to triangulate the data gathered here and could help clarify the topic of interactions.

Furthermore, whilst the chi-squared tests determined where statistical differences were between the non-parametric data, the test did not determine the direction or cause of this difference therefore visual comparisons were needed to identify this. As this is a manual method of analysis this has a risk of error and although this was aimed to be reduced by having a number of research team members undertaking the processes this cannot be fully mitigated.

A limitation of stage two of the study (semi-structured interviews) also related to participant recruitment. As the study progressed it became clear that recruiting participants from North and West Wales was not practicable due to a number of factors including distance, time and response to participation requests. Therefore although the study achieved a strong repetition of themes (Malterud et al., 2015) participants from these demographic areas may have had different views on IPIs due to variations in pharmacy locations (possibly rural) and the provision of services, as well as the use of the Welsh language in conducting interactions. Furthermore, as results were based on personal experiences it is difficult to conclusively state that recruitment of more participants in general would not have impacted the data and themes generated (Morse et al., 2002; Bowen, 2008; Corbin and Strauss, 2008).

One limitation in this study was that the researcher who designed the interview schedule and conducted data analysis (the thesis author) did not directly undertake the interviews (these were conducted by a final year MPharm student). This may have resulted in possible loss of unspoken or implied data provided through body language and other social cues (Babbie, 2015d). Additionally, as discussed in chapter 4 the researchers personal views and experience impacts qualitative research, therefore although the thesis author undertook all other aspects of the project (including interview schedule design and analysis) the semi-structured nature of the interview may have resulted in the student probing different areas than if undertaken by the thesis author. The students limited experience within practice and in the research area of interprofessional collaboration and education where particular areas that differed significantly to the thesis author. Furthermore, as a student the interviewees responses may have differed than if interviewed by a qualified pharmacist 'peer' (i.e. the thesis author) as they may have felt inclined to provide further explanation of topics they believed the student had reduced understanding of. These limitations were aimed to be reduced by providing the student with thorough interview training and supervised pilots, as well as the thesis author reflecting on the interviews in advance of the next interview.

A further limitation to the interview approach is that of demand characteristics. This is where, according to Orne (1962), participants make inferences as to the purpose of an experiment and respond either accordingly or in contrary to the perceived purpose of the study as a result of environmental cues (such as the interviewer's body language, tone of voice, and facial expressions (Kirk, 1982)). This can result in participants aiming to 'please' the interviewer by providing responses they believe are of value. Furthermore, as

interviews were conducted in the participant's workplace (for convenience) this meant that distractions and disruptions which could impact the data gathered (Babbie, 2015d) occasionally occurred, particularly as 13/14 participants were the sole responsible pharmacist within their stores resulting in a number of issues/queries being directed to them during the interview.

Another limitation to both stages of this study was that the study population centred solely on pharmacists within Wales, and although the GPhC regulates pharmacists from across the UK and therefore there will be many similarities with other UK countries, as NHS healthcare is devolved into the four UK countries there may evidently be some differences in pharmacists interprofessional practice. Further work would be required in order to explore these similarities and differences.

## 5.5. Conclusion

This study has provided a greater understanding of the IPIs community pharmacists undertake in practice. Stage one (questionnaire) identified the HCPs community pharmacists most frequently interacted with, namely GPs and community nurses based in GP practices and dentists often based in distinct primary care premises. Stage two (semi-structured interviews) determined the topics and mode of interactions, which often varied between being clinical and practical issues which were mainly addressed over the phone. Interactions with GPs, nurses and dentists tended to be collaborative to ensure patients were prescribed the appropriate medications. IPIs with secondary care HCPs were less frequent than with primary care HCPs and were often relates to transfer of patient information rather than collaborative working. When community pharmacists operated in premises that were co-located with GP practices, their reported levels of interaction were significantly more frequently with those HCPs similarly co-located i.e. GPs, community nurses, midwives and health visitors and were more commonly face-to-face in nature. Co-location also helped reduce a number of barriers to interactions recognised throughout the interviews including limited access to HCPs and the broker role of the receptionist, although barriers such as time constraints were not observed to benefit from this physical co-location. One method suggested by participants in the study to improve IPIs was the incorporation of relevant and meaningful IPE into undergraduate and postgraduate education and most preferably with doctors and nurses. It was felt these sessions could aid understanding of and respect for one another's professional roles and improve communication skills, both factors participants suggested were facilitators of interprofessional collaboration. In addition, many participants commented that interprofessional relationships improved over time and therefore suggested that implementing IPE as early as possible into the MPharm curriculum and continuing this into postgraduate education could prevent the development of professional stereotypes. Although community pharmacists were seen to engage with other HCPs it is clear that further work is needed to achieve fully integrated and collaborative interprofessional practice.

**Chapter 6 - Which healthcare professionals do hospital  
pharmacists work with?**

## 6.1. Introduction

Although ‘treatment’ modalities related to diagnostics, surgery, imaging and devices have advanced in recent years, medicines remain the most common therapeutic intervention. Over 97% of patients residing in hospital take medicines (NHS Wales, 2018a) with £800 million spent on prescribed medicines in Wales each year and the number of prescribed items having increased by 46% in the 10 years prior to the report conducted by the Auditor General for Wales (2016). Medicines are also associated with waste estimated to cost some £10 million per annum in Wales (National Assembly for Wales, 2018). The Auditor General for Wales (2016) has also highlighted the potential for around £8.3 million in savings through improved prescribing practices. As such, the safe and effective management of medications along with their prudent use is a crucial aspect of providing the best care possible to patients. Much like within community pharmacy, the role of the hospital pharmacist has expanded in recent years and has moved away from the practical tasks that have historically been associated with pharmacy such as dispensing medications (Department of Health, 2010; Carter, 2016). Whilst progress has been made towards pharmacists providing clinical patient facing services in the secondary care sector, Carter (2016) has suggested that further progress is needed to ensure pharmacists are removed from some of the historic technical roles such as purchasing, storage, manufacture, quality testing and supply of medicines in the hospital, as they are a poor use of pharmacists’ time and skills. To do this they stated that trusts should undertake a ‘Hospital Pharmacy Transformation Programme’ to ensure that “hospital pharmacies achieve their benchmarks such as increasing pharmacist prescribers, e-prescribing and administration, accurate cost coding of medicines and consolidating stock-holding by April 2020 so that their pharmacists and clinical pharmacy technicians spend more time on patient-facing medicines optimisation activities” (pg. 9)(Carter, 2016).

Ultimately, hospital pharmacists must be employed within the secondary care setting to best utilise their skills as experts in medicines and to ensure they have a direct influence on the clinical care provided to patients. One key role pharmacists undertake is ensuring each medication is appropriate for the patient. Pharmacists will consider a number of factors including the dose, route of administration, potential adverse effects, interactions with existing medications, contraindications in patients with certain conditions (such as cardiac failure, renal disease or liver disease) or if pregnant/breastfeeding and the patients’ general lifestyle (NHS Wales, 2018a). In order to fulfil this role, pharmacists commonly carry out daily ward rounds where they utilise multiple sources of information including the patient’s

drug charts and notes as well as interacting with the patients themselves and with other HCPs. In addition to conducting their own ward rounds, pharmacists are increasingly involved in interprofessional ward rounds and MDT meetings. These provide pharmacists the opportunity to have direct interaction with other HCPs where they can provide expert advice about a patient's medications and deliver interprofessional holistic patient care.

Adjunct to the provision of daily inpatient care is the management of patients' medications on both admission and discharge. When patients are admitted to hospital, pharmacists have a role in ensuring that the medication patients receive in hospital reflects and is a consequence of that received within the community. Therefore, pharmacists often conduct medicine reconciliations where they utilise multiple sources of information including primary care records and HCPs to accurately align medications as patients traverse across sectors. In addition, hospital pharmacists manage patients' discharge prescriptions, ensuring that patients are appropriately supplied with and counselled on their medications and that any information relating to changes in a patient's medications, such as reasons for medications stopping or starting, is transferred to the relevant primary care practitioners (NHS Wales, 2018a). This role in transferring information between HCPs helps ensure continuity of care across the secondary and primary healthcare sectors, with the importance of timely and accurate information transfer vital in preventing hospital (re)admissions (Ham et al., 2010). The expansion of the clinical pharmacist role has also led hospital pharmacists to take on roles outside of the ward environment in areas such as the emergency department and outpatient clinics where advanced practitioner pharmacists (often independent prescribers) can build up their specialist skills in assessing and managing patients with pharmaceutical interventions (NHS Wales, 2018a). Whilst some expansion in these areas has occurred there is clearly room for further involvement of pharmacists, particularly since a study commissioned by NHS Health Education England (2016) found that of the 18,613 patient cases examined within emergency departments, 36% had the potential to be clinically managed by a pharmacist.

Consistent with the maturation of the clinical pharmacist role in secondary care has been the need for pharmacists to engage in multidisciplinary collaboration with other HCPs (Kaboli et al., 2006; Carter, 2016). This has partly been driven by workforce demands and the drive to integrate the health workforce led by the World Health Organisation (2010) but also as a consequence of a number of inquiries within NHS trusts (Francis (2013), Andrews and Butler (2014), Kirkup (2015) and Carter (2016)) which have documented exemplars of

ineffective interprofessional team working in hospitals that has directly resulted in poor patient care.

As a profession that was primarily focused on the supply of medicines against a prescriber's orders, it has taken time to integrate pharmacists into multidisciplinary clinical teams within both primary and secondary care. There is evidence however that multidisciplinary team work is becoming embedded in the role. For example, in a recent survey by the General Pharmaceutical Council (2018b), pharmacists indicated that providing information and advice to HCPs was their primary activity. Interprofessional integration not only supports better patient care but it also affords professional growth. For example, in a study conducted by Rosenthal et al. (2010b) the role of the hospital pharmacist was often found to be impersonal. However, when pharmacists were integrated within the interprofessional team they were better appreciated by both patients and colleagues as they had a greater understanding of their own role within the wider healthcare team.

This drive to further integrate pharmacists within the interprofessional team has been reinforced by the Royal Pharmaceutical Society (2017c) in their Professional Standards for Hospital Pharmacy Services document. This document highlighted the need for pharmacists to work regularly alongside doctors, nurses and other members of interprofessional team to give clinical advice on the appropriate selection of patients' medications. In a separate document (the Pharmacy Workforce Summit Report) they also believed that in order to do this pharmacists' roles and responsibilities need to be better promoted and articulated to ensure that HCPs have a greater understanding of the value pharmacists bring to the interprofessional healthcare team (Royal Pharmaceutical Society, 2017b).

Although there are a variety of UK studies that have explored community pharmacists' interactions with general practitioners (GPs), little is known about pharmacists interprofessional interaction in the hospital environment. One area of limited literature surrounds hospital pharmacists' role in liaising with healthcare professionals in the primary care setting when patients are discharged from hospital (Eggink et al., 2010). The seminal paper in this area was a systematic review of pharmacists' clinical interventions conducted by Kaboli et al. (2006). Whilst the review reported that the hospital pharmacists' role in reconciling medications and aiding the discharge process improved patient outcomes, the studies included in the review did not identify the nature of the interprofessional interactions or activities that were necessary in order to ensure continuity of care. Only a very limited number of studies have aimed to address hospital

pharmacists' interactions with other HCPs (namely hospital doctors and nurses) but include (i) a study by Makowsky et al. (2009b) who conducted key informant interviews and reflective journaling from pharmacists, doctors and nurse practitioners to explore the interprofessional working relationships when providing team-based care in hospitalised medical patients in Canada and (ii) focus groups with Australian nursing, pharmacy, and medical recent graduates conducted by Wilson et al. (2016) which aimed to determine their perspectives and experiences of interprofessional collaborative practice and medication safety.

Given that hospitals contain a wide spectrum of HCPs all co-located in the same building, it might be assumed that the environment naturally promotes pharmacists' interprofessional collaboration (as found for pharmacists in the primary and community sectors (Jenkins et al., 2016)). However, it is difficult to understand if this is the case given the paucity of published research identifying the frequency and nature of interprofessional interactions that take place in the hospital environment. This lack of knowledge of the current landscape makes it difficult to ascertain where development or improvements to current practice or education and training are needed in order to embed effective interprofessional, patient-centred care that improves patient outcomes.

This mixed method study therefore aims to explore the interprofessional interactions that take place between hospital pharmacists and other HCPs during their current scope of practice and to explore pharmacists' views on the value of IPE. The approach adopted is in two stages: (i) a self-complete questionnaire administered to all hospitals containing dedicated in-house pharmacy departments in Wales to determine hospital pharmacists' reported frequency of interaction with HCTMs; (ii) face-to-face semi-structured interviews with a number of hospital pharmacists based across a range of hospitals in Wales to explore the nature of IPIs and to determine the value they place on IPE.

These two sequential elements aimed to identify and/or explore hospital pharmacists' (based within Wales) perceived views in a number of areas including:

1. Hospital pharmacists' perceived frequency of interactions with other HCTMs
2. Hospital pharmacists' perceived topic of interprofessional interactions with other HCPs
3. The mode through which hospital pharmacists perceived their interprofessional interactions with other HCPs took place (e.g. by telephone, face-to-face)

4. The perceived facilitators and barriers to hospital pharmacists interprofessional interactions with other HCPs
5. The perceived value hospital pharmacists place on IPE
6. Hospital pharmacist's opinions on the design and implementation of relevant and meaningful undergraduate/postgraduate pharmacy related IPE.

## 6.2. Methods

In order to pragmatically and thoroughly address the research aims, to determine and explore hospital pharmacists' interprofessional interactions (IPIs) and the value they place on IPE, the use of mixed methods was chosen as this attracts benefits from both quantitative and qualitative methodological approaches (Johnson and Onwuegbuzie, 2004). The study was conducted in two parts:

**Stage one – Questionnaire:** The first stage of this study sought to quantify the reported frequency of interactions between hospital pharmacists and other healthcare team members (HCTMs) using a self-complete questionnaire which was administered to all hospitals in Wales containing dedicated in-house pharmacy departments.

**Stage two – Semi-structured interviews:** Informed by results from stage one, semi-structured interviews were conducted with hospital pharmacists to elucidate the nature of the IPIs in which they engage and to determine the perceived value of IPE.

A broad overview of the methods employed for both community and hospital pharmacists is described in chapter 4 – General Methods. The following section however provides specific detail on the methods employed here.

### **6.2.1. Stage one – Questionnaire determining hospital pharmacists' frequency of interaction with other healthcare professionals and wider team members**

This section describes the specific methods for the design, recruitment and dissemination of a questionnaire to hospital containing dedicated in-house pharmacy departments in Wales which sought to determine the frequency of interaction between hospital pharmacists and other HCTMs (comprising of HCPs and wider healthcare team members).

#### **6.2.1.1. Questionnaire design**

A questionnaire was developed to determine hospital pharmacists' reported frequency of interactions with other HCTMs. This questionnaire was adapted from the questionnaire used to determine the frequency of interactions between community pharmacists and HCTMs (see chapter 5). The questionnaire was piloted (see chapter 4.3.5) and validity was determined to be 0.880 (see chapter 4.3.6). The questionnaire consisted of three sections (see Appendix M). Section A sought to determine demographic information about the respondent including the hospital the respondent worked in as well as details surrounding the respondent's role including their speciality (e.g. cardiology/aseptics/etc.) and the setting in which they primarily worked (e.g. ward/office based/etc.). In section B respondents were asked to indicate their reported frequency of 'direct personal interaction' with each of a list of 29 HCTMs using a 6-point ordinal scale (at least once a day, at least once a week, at least once a month, at least once a year, less frequently, never). The list was adapted from that used in the community questionnaire to ensure relevancy to secondary care. This meant separating the hierarchical roles of hospital doctors and including the 'drug and alcohol team'; a full list of all 29 HCTMs provided can be found in **Table 6.1**.

**Table 6.1.** List of the 29 HCTMs, identified from the NHS careers website and previous community questionnaire, included in section B of the questionnaire, categorised according to their sector of practice

Primary care HCTMs based in GP practice		
Drug and alcohol team <sup>^</sup>	General practitioner (GP)	GP practice manager
GP receptionist	Health visitor <sup>^</sup>	Midwife <sup>^</sup>
Nurse - Community	Pharmacist - Community	Pharmacist - Primary care
Primary care HCTMs based outside the GP practice		
Care home staff	Dentist	Optician
Vet		
Secondary care HCTMs		
Dietician <sup>^^</sup>	Doctor - Consultant	Doctor - Junior (FY1/FY2)
Doctor - Registrar (ST1-3)	Nurse - Hospital	Occupational therapist <sup>^^</sup>
Paramedic <sup>^^</sup>	Physiotherapist <sup>^^</sup>	Podiatrist <sup>^^</sup>
Radiographer <sup>^^</sup>	Social worker <sup>^^</sup>	Speech and language therapist <sup>^</sup>
Hospital pharmacy HCTMs		
Accredited checking technician <sup>^^</sup>	Dispenser/Technician <sup>^^</sup>	Medicines counter assistant <sup>^^</sup>
Pre-registration Pharmacist <sup>^^</sup>		

<sup>^</sup> = HCTMs which can also have a role in secondary care

<sup>^^</sup> = HCTMs which can also have a role in primary care

A free text box was also provided in section B where respondents could list any 'other' professionals they interact with in addition to those listed. Section C allowed respondents the opportunity to provide any comments they had with respect to the interprofessional interactions they undertake.

### 6.2.1.2. Sampling and dissemination

To ensure that responses collected were representative of the hospital pharmacist population within Wales, purposive sampling (Babbie, 2015c) was used. The aim was to reach all pharmacists working within Welsh hospitals that contain dedicated in-house pharmacy departments. A list of 18 hospitals across six Welsh LHBs which contained pharmacy departments was identified from the NHS Wales (2016) website and was corroborated by contacting senior pharmacists within each health board. Additionally, Velindre hospital in Cardiff (a specialist cancer hospital not directly associated with the Welsh NHS LHBs) was also invited to take part due to the hospital employing a number of hospital pharmacists. Of note, one Welsh LHB, Powys Teaching Health Board, did not have any hospitals containing dedicated pharmacy departments and subsequently did not directly employ any hospital pharmacists at the time of the study. Gatekeepers acting as 'project champions' were utilised within each hospital. Gatekeepers were identified and recruited through either the All Wales Patient Safety and Quality Group or the Chief Pharmacist within the hospital or health board. All gatekeepers were pharmacists working within the hospital and often had a role which included research and development.

Once gatekeepers were recruited for all 19 hospitals they were asked to provide the number of pharmacists working within the hospital (where exact numbers were unknown estimates were given). Gatekeepers were then directly mailed a package that comprised questionnaires (see Appendix M) and cover letters (see Appendix N) sufficient for the reported number of pharmacists within the hospital (plus an additional 10%). The gatekeeper was then responsible for disseminating the questionnaire and cover letter to all pharmacists within the hospital and for collecting and returning them to the research team upon completion. To do this they were asked to send out a recruitment email informing their hospital pharmacist colleagues of the project; a template email was provided (Appendix O). An electronic version of the cover letter was also attached to the email to provide further information on the study. The cover letter indicated that respondents needed to be a qualified pharmacist who worked within that specific hospital for a minimum of two days a week to ensure they had a good understanding of the interprofessional interactions that are characteristic of the hospital in which they practise.

The date on which the questionnaires were disseminated varied for each hospital and was dependent on gatekeeper availability. Generally, dissemination took place over a 6-week period per hospital between March and July 2016. Gatekeepers were prompted to disseminate a reminder email three weeks after the initial recruitment email. Responses were collated by the gatekeepers and sent back to CSPPS for analysis. Questionnaires were uniquely coded so that the research team was aware of which hospital's responses had been received and could identify those gatekeepers where reminders were required.

### **6.2.2. Stage two – Semi-structured interviews exploring the nature of interprofessional interactions between hospital pharmacists and healthcare professionals**

Following the questionnaire element of the study, which identified the frequency of interaction between hospital pharmacists and other healthcare professionals and team members, a qualitative approach was employed to explore the nature of these interactions, specifically the HCPs hospital pharmacists interacted most frequently with. This was achieved through face-to-face semi-structured interviews with a variety of hospital pharmacists. The interviews focused on a number of broad topic areas including: (i) identifying the HCP which they interact with most frequently; (ii) the mode by which their interprofessional interactions take place; (iii) the content of their interprofessional interactions; (iv) barriers and facilitators to interprofessional interactions; (v) the

participants' views on IPE. This section describes the specific nuances for conducting these interviews, however a broad overview of the methods used for these interviews can be found in chapter 4.

#### **6.2.2.1. Participant recruitment**

Purposive, snowball sampling was used to recruit pharmacists with a range of experiences and demographic characteristics across Wales. Recruitment continued until the sample size was sufficiently large and varied to ensure data encompassed views across the hospital sector and constant comparison methodology identified strong repetition of data and themes and study aims had been achieved (Bowen, 2008; Malterud et al., 2015) (see chapter 4).

The data gathered from stage one of this study (the questionnaire) and findings from the community pharmacist study (see chapter 5) informed the design of the interview schedule and the recruitment process to ensure that data gathered was meaningful and representative of the overall hospital pharmacist population in Wales (Creswell and Creswell, 2017). The initial recruitment phase aimed to identify a number of suitable pharmacists across a range of demographic categories that included: (i) the hospital that participants worked (including size of hospital); (ii) the health board of the hospital; (iii) length of time working within the hospital; (iv) participants' speciality (e.g. surgery, cardiology, etc.); (v) participants' current professional grading (NHS banding); (vi) depth of experience of interprofessional education; (vii) the location of the participants pre-registration training; (viii) participants previous community experience; (ix) university of study and (x) the year participants graduated from university. The Aneurin Bevan University Health Board was excluded from the study as ethical approval was not forthcoming. As within stage one of this study (see section 6.1.2.1) Powys Teaching Health Board was also excluded as none of the hospitals within this LHB contained a dedicated pharmacy department.

Participant recruitment was generally through the gatekeepers used within stage one (questionnaire) of the study as they were able to suggest possible participants who regularly worked within the hospital at least two days a week and fit the demographic characteristics required. The gatekeepers provided potential participants with the study cover letter (see Appendix P) and information sheet (Appendix Q). Upon receipt of this information if potential participants were interested in taking part the gatekeeper provided the research team with the potential participant's email address in order that a formal

recruitment email could be sent. The email detailed a proposed interview time (often pre-arranged through the gatekeeper), provided a consent form (see Appendix R) and a copy of the information sheet and cover letter (for completeness). Written consent was then obtained from the participant on the day of the interview.

At the end of each interview, participants were asked if they could recommend possible interviewees who fulfilled other desired demographic criteria to broaden the population (purposive, snowball sampling).

### **6.2.2.2. Interview setting**

Interviews were conducted face-to-face in each pharmacists' hospital. The gatekeeper helped to arrange a suitable quiet space for the interviews to ensure the interview was free from distractions and the recording was of a high quality (King and Horrocks, 2010a). As the interviews were specifically related to the participant's experiences in that hospital, conducting interviews in the workplace environment may have been beneficial in aiding the participant's recall of interactions (Coughlin, 1990).

### **6.2.2.3. Interview Schedule Data Collection**

The interview schedule (see Appendix S) was developed based on: (i) the interview schedule developed for the community interviews (see chapter 5); (ii) data gathered in stage one of this study; (iii) existing literature on pharmacist interactions with other healthcare practitioners and (iv) the personal knowledge of the researcher within the field of pharmacy. The interview schedule was separated into four parts (sections A to D). In section A, participants were asked about their current and previous experience of pharmacy practice. The questions were brief and aimed to ease the participant into the interview (Kvale, 2007). Section B comprised a reflective 'ranking exercise' that was used to help the participant reflect upon their own interprofessional practice within their current role and help immerse the participant in the interview. In this exercise participants were asked to rank cards labelled with fifteen relevant HCPs (see **Table 6.2**) based on their reported level of interaction with these HCPs. The members of the wider healthcare team such as pharmacy dispensers, GP receptionists and other pharmacists were excluded from this exercise (for an explanation see chapter 4).

**Table 6.2.** List of the 15 HCPs identified from the NHS website included in the ranking exercise

Dentist	Nurse	Podiatrist
Dietician	Occupational therapist (OT)	Radiographer
Doctor	Optician	Social worker (SW)
Health visitor (HV)	Paramedic	Speech and language therapist (SALT)
Midwife	Physiotherapist (Physio)	Vet

In section C of the schedule, participants were asked about their interactions with hospital doctors, hospital nurses and dietician i.e. the three professions identified in stage one of the study as those with which respondent hospital pharmacists indicated they interacted with most frequently (see section 6.3.1 for stage one results). In addition, if during the ranking exercise any participant indicated that one or more of their top three interactions was with a different HCP, the interactions with the additional HCPs was also explored. The final part to the interview, section D, included general questions about interprofessional working and the participant's past experiences of IPE.

The questionnaire was piloted ( $n = 3$ ) and a number of refinements were made based on the feedback around the wording and structure of the demographic questions.

In a number of cases, multiple interviews were conducted on a single day at a particular hospital site; this was for the purposes of convenience. Where this occurred, a one hour break between interviews was used to enable time for reflection on the previous interview and adaptation of the interview schedule where appropriate (King and Horrocks, 2010a; Babbie, 2015a). All interviews were transcribed *verbatim* by the thesis author and were reviewed on three occasions to ensure final transcripts were accurate and representative (Babbie, 2015a). The aim was for all transcriptions to be completed before the next interview(s) took place to aid the reflective process (King and Horrocks, 2010a). Further details on the general methodology employed including deductive and inductive thematic analysis approaches can be found in chapter 4.

### 6.3. Results

As with study methods (see section 6.2), the results have been separated into the two research stages: (i) **stage one - questionnaire**; (ii) **stage two - semi-structured interviews**.

#### 6.3.1. Stage one – Questionnaire determining hospital pharmacists' frequency of interaction with other healthcare professionals and wider team members

In this study, purposive sampling was used to determine the frequency of interactions between pharmacists and other HCTMs (comprising of HCPs and other staff within the healthcare team) from a cross section of hospital pharmacists regularly practising in Wales. To achieve this 'gatekeepers' were utilised to disseminate the questionnaire to all hospital pharmacists (approximately 520) within each of the 19 hospitals in Wales containing in-house pharmacy departments.

##### 6.3.1.1. Response rate

In total, from the estimated population of 520 pharmacists across the hospitals surveyed, 270 questionnaires were returned giving an overall (estimated) response rate of 51.9%.

##### 6.3.1.2. Respondent demographics

Section A of the questionnaire was concerned with collecting demographic data related to the responding pharmacist and the hospital in which they practise. This was focused on five particular areas: (i) the health board associated with the hospital they worked in; (ii) the size of hospital; (iii) the participant's NHS grading (banding); (iv) any particular specialism, and (v) the particular environment (e.g. ward, office etc) in the hospital they work in. All 270 participants completed each of the five questions in this section. Respondents could provide multiple responses to the questions (iv) and (v), therefore a secondary question asked them to state their primary specialism and environment. These follow up questions yielded lower responses; primary specialism (n=226/270), regular working environment (n=256/270).

##### 6.3.1.2.1. Spread of respondents across Local Health Boards

Whilst the estimated number of hospital pharmacists in each LHB varied significantly (range 15 – 116) the percentage of pharmacists responding by board was generally consistent across six of the seven LHBs (including Velindre)(range 50.4 – 68.8%), however

200

Cardiff & Vale UHB had a much lower response rate of 24.3%, impacting the overall mean and standard deviation across the LHBs ( $51.9 \pm 15.4\%$ ) (see **Table 6.3**). Completed questionnaires were received from all 19 hospitals surveyed, with the number of respondents per hospital ranging from 6 to 33 responses. Details of responses per hospital have not been individually presented in order to preserve anonymity.

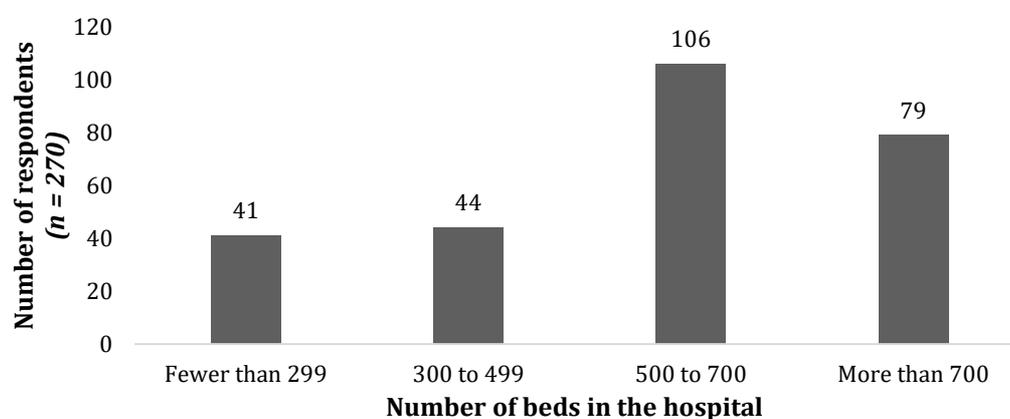
**Table 6.3.** Distribution of hospital pharmacist respondents ( $n=270$ ) across the Welsh Local Health Boards

Local Health Board (LHB)	Number of respondents (n=270)	Percentage of total (%)	Number of pharmacists in each LHB (approx.)	Percentage of pharmacists responding (%)
Abertawe Bro Morgannwg	58	21.5	115	50.4
Aneurin Bevan	33	12.2	48	68.8
Betsi Cadwaladr	76	28.1	116	65.5
Cardiff & Vale	28	10.4	115	24.3
Cwm Taf	40	14.8	70	57.1
Hywel Dda	25	9.3	41	61.0
Velindre*	10	3.7	15	66.7

Velindre\* = not technically not a Welsh LHBs, however included due to presence of a in-house dedicated pharmacy department within the hospital

### 6.3.1.2.2. The size of hospital each pharmacist work within

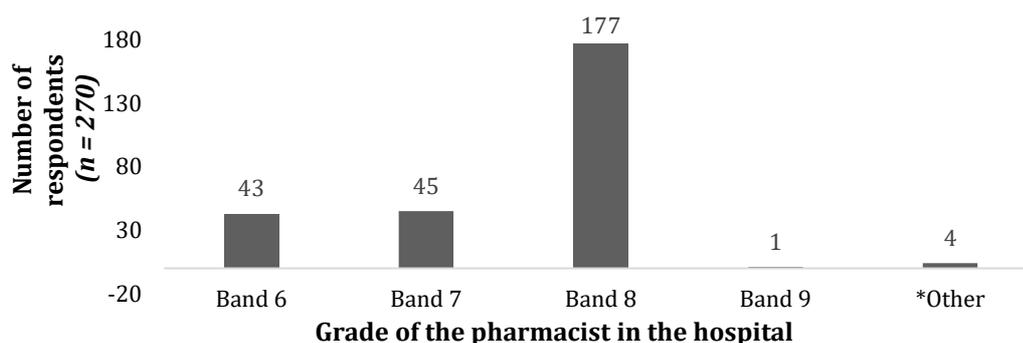
Respondents were asked to describe the size of the hospital they worked within based on the number of beds. **Figure 6.1** indicates that the highest number of respondents worked within a hospital with 500 to 700 beds with smaller hospitals, (fewer than 299 and 300 to 499) representing less respondents. This also provided a sense check as responses could be correlated with the known size of each hospital - all respondents stated size aligned with the known size for their specific hospital.



**Figure 6.1.** The size of the hospital each pharmacist ( $n=270$ ) worked within

### 6.3.1.2.3. The grade of the pharmacist in the hospital

Respondents were asked to state their grade within the hospital based on NHS banding (a pay scale ranging from band 6 to band 9 for qualified pharmacists). Respondents were primarily at band 8 (n=177; 66%) with just one respondent a band 9 pharmacist and four respondents additionally indicating that they were pre-registration pharmacists (band 5) (see **Figure 6.2**).



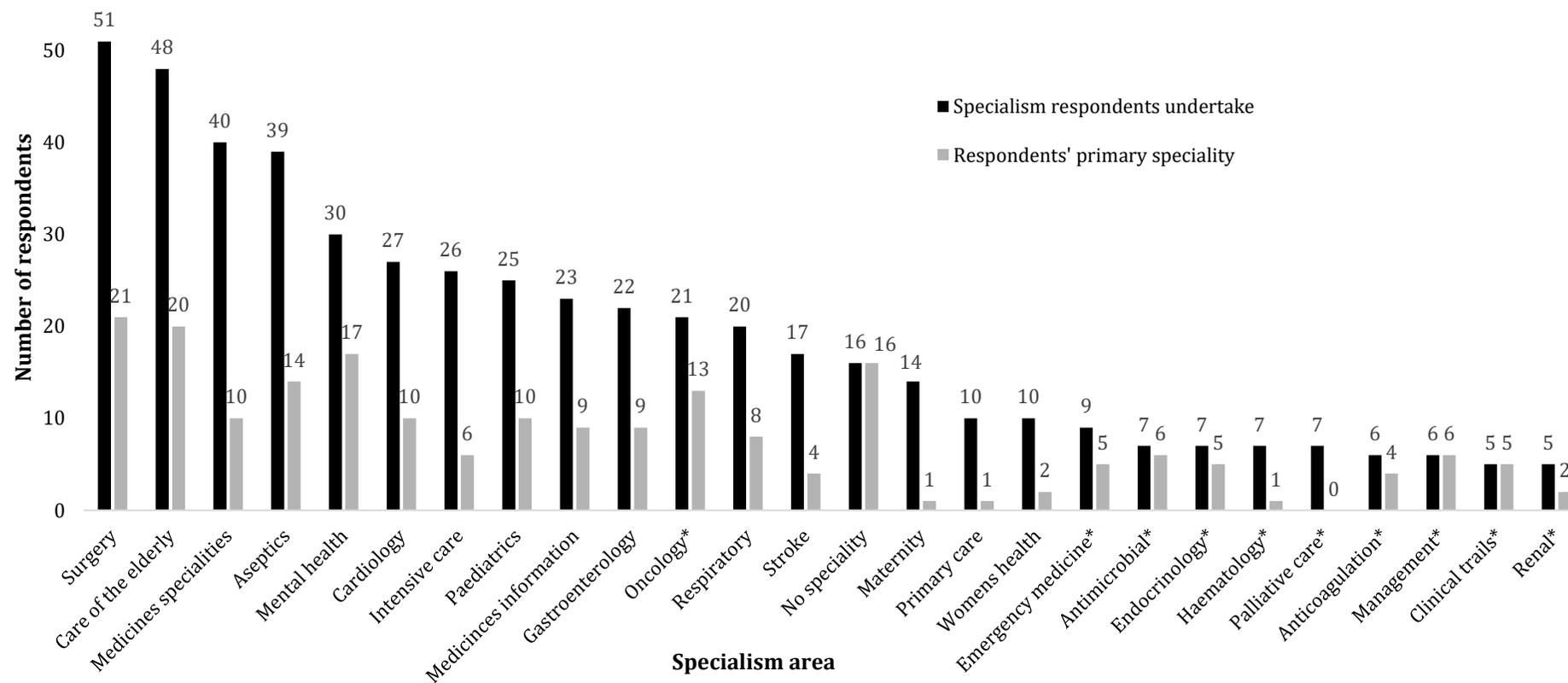
**Figure 6.2.** The grade of the pharmacist (n=270) within the hospital

\*Other = Band 5 pre-registration pharmacists (trainees who are not yet fully qualified)

### 6.3.1.2.4 Respondents' specialist area of practice

Respondents were asked to identify all the specialisms they undertake and their primary specialism if more than one. Although all respondents indicated they have specialism (n=270), just 226 (44 missing) indicated their primary specialism, with 16 stating they did not have a specialism.

In total 17 specialisms were listed within the questionnaire, with only one, 'complex health', that was not selected by any respondents. In addition, 102 respondents stated 27 'other' specialisms not directly listed within the questionnaire, with 68 of these respondents indicating one of these 'others' as their primary specialism. In total 43 specialisms were reported by respondents, 39 of which were at least one respondent's primary specialism. **Figure 6.3** shows all those specialisms that at least five respondents undertook and also highlights the number of respondents who stated each as their primary specialism. In addition to **Figure 6.3** there were 18 other specialisms stated by less than five respondents.



**Figure 6.3.** The specialisms more than five hospital pharmacist respondents undertook and the number of times these were respondents' primary specialism

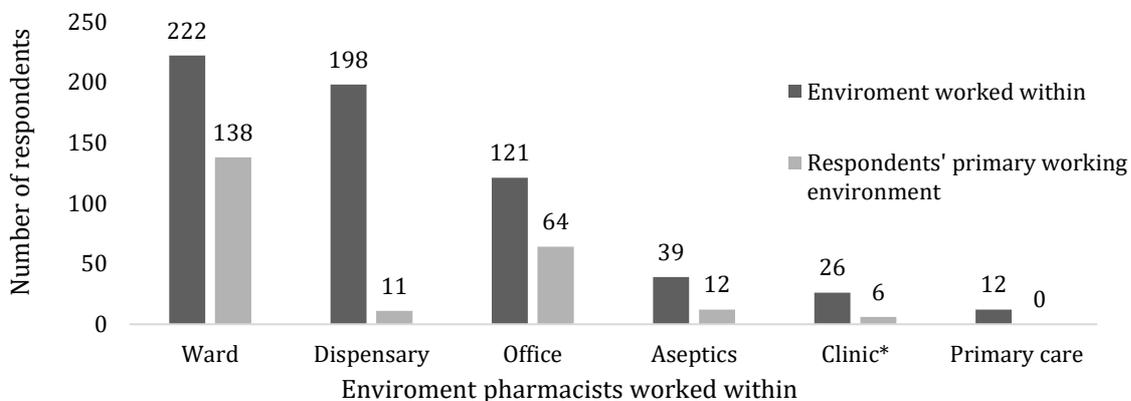
\*These were specialisms that were not listed within the questionnaire and were stated by respondents in the 'other' section

### 6.3.1.2.5. The environment in which the respondent practises

The environment in which each pharmacist practised was also explored; respondents had the opportunity to indicate more than one environment. This resulted in 629 selections across all participants (n=270), with the ward being the most frequent working environment (222/270). Although all respondents stated a work environment just 234 stated the environment they worked in most frequently (36 missing). The data also showed that the majority of respondents' primary working environment was the ward (n=138), followed by the office (n=64). Although a large proportion of respondents worked within the dispensary (n=198) this was rarely respondents primary working environment (n=11).

**Figure 6.4** shows all those environments that at least five respondents worked within and also highlights the number of respondents who stated each as their primary working environment.

In addition to the five options provided within the questionnaire 37 respondents indicated eight 'other' environments they worked within. The only 'other' environment where more than 5 respondents worked within was the 'clinic'. This accounted for six of nine respondents who stated an 'other' option was their primary working environment.



**Figure 6.4.** The environments more than five hospital pharmacist respondents worked within and the number of times these were respondents' primary working environment

Clinic\* = An environment stated as an 'other' option by respondents

### **6.3.1.3. Frequency of interaction between hospital pharmacists and other healthcare team members**

Section B of the questionnaire was concerned with the overall frequency of interactions between the 270 responding pharmacists and other HCTMs. Findings are displayed in **Table 6.4** and **Figure 6.5** which show the percentage of responding pharmacists who indicated they work with HCTMs at least once a month and at least once a week (**Table 6.4** also shows daily interactions). These percentages were based on the response rate per HCTM which varied (also shown in **Table 6.4**), with a mean response rate of 268/270 was received across all 29 HCTMs.

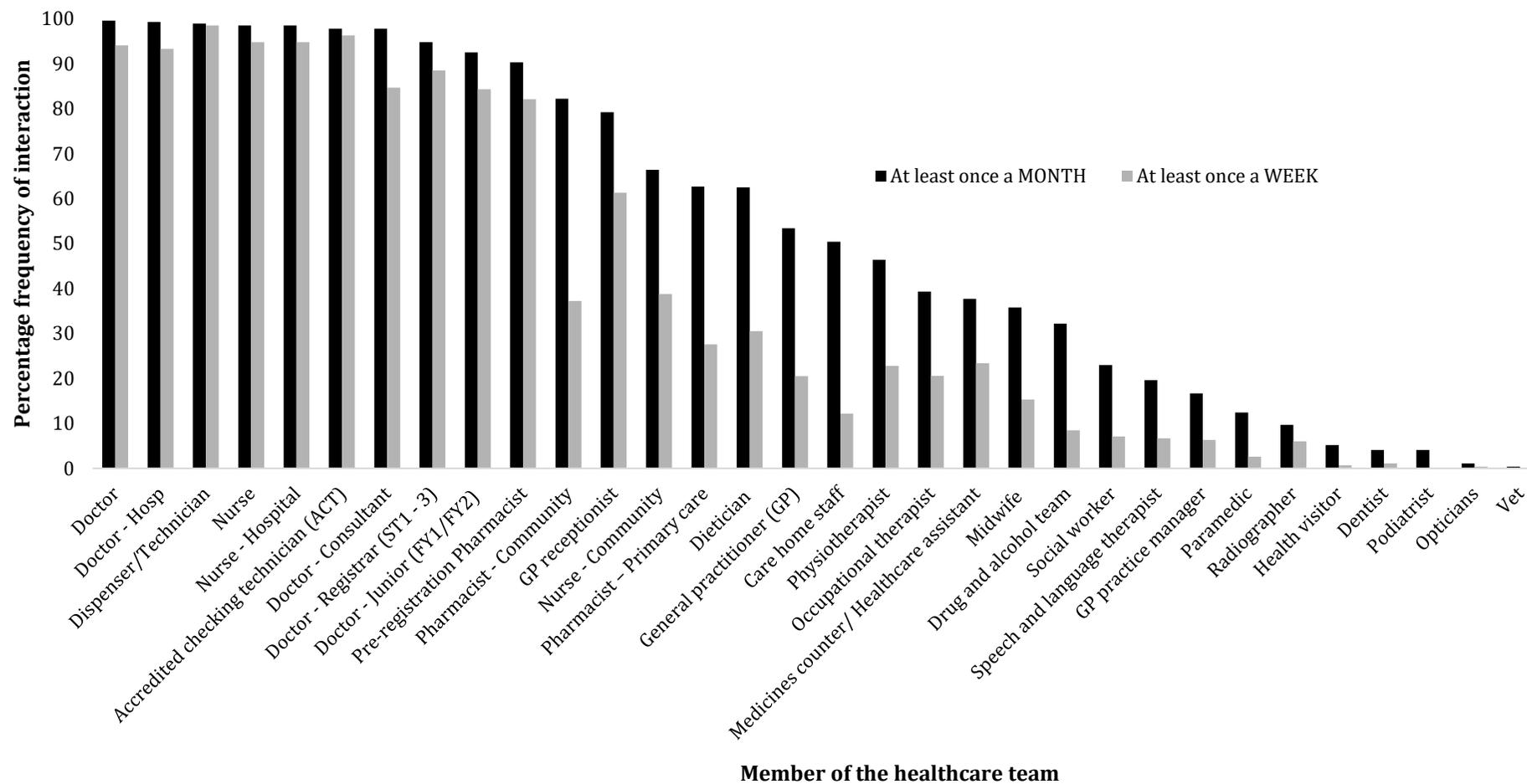
Much like their community pharmacist counterparts, hospital pharmacists reported that they interact most frequently with doctors and nurses, with nearly all pharmacists reporting they interact at least once a month (doctors - 99.6%, nurses - 98.5%), and at least once a week (doctors - 94.1%, nurses - 94.8%) and a significant majority interacting on a daily basis (doctors - 77.4%, nurses - 87.0%). Interactions with hospital doctors were across the hierarchical levels but seniority appeared to impact on the frequency with which the interactions occurred. For example, although the highest percentage of pharmacists interacted with junior doctors on a daily basis (70.5%), pharmacists' had the most weekly interactions with registrars (88.5%) and interacted with consultants more than all other level of doctors on a monthly basis (97.8%).

In common with the findings from the community pharmacist questionnaire (see chapter 5), the data shows that pharmacists' reported interactions were most frequent with HCTMs who were similarly located with them, in this case within the hospital. In addition to hospital doctors and nurses this included dieticians (where 62.5% of respondents reported to interact on a monthly basis) and physiotherapists, occupational therapists and midwives (where over a third of respondents interacted at least once a month). Except for hospital doctors and nurses the level of regular daily interactions tended to be low with all other HCPs irrespective of their location, with the highest proportion of pharmacists (7.1%) interacting with dieticians on a daily basis. Daily interactions were however much more frequent with HCTMs within the pharmacy team such as dispenser/technicians (D/Ts) (where 91.5% of respondents interacted daily) and accredited checking technicians (ACTs) (88.5%).

The impact of co-location was most evident when respondents' daily interactions with doctors and nurses. For example, 87.0% of pharmacists interacted with hospital nurses on a daily basis, compared to 3.0% with community nurses. Similarly, 77.4% of respondents interacted with hospital doctors on a daily basis compared to just 3.7% interacting with GPs at the same rate. Additionally, none of the respondents reported that they interact more frequently with community nurses than hospital nurses, however of note, two respondents indicated that they interact more frequently with GPs than hospital doctors. One of these respondents was the band 9 pharmacist who completed the questionnaire, and the other was a band 8 pharmacist who did not state any specialism. In common with community pharmacists, respondents reported that they interact more frequently with GP receptionists rather than HCPs based within GP practices. Interactions with other primary/community care HCPs also tended to be infrequent with no hospital pharmacist interacting on a daily basis with dentists, health visitors, opticians, paramedics, podiatrists or vets.

**Table 6.4.** Percentage of hospital pharmacists reporting that they interact with each HCTM at least once a month/week/day ordered by 'at least once a month'

<b>Member of healthcare team</b>	<b>Response rate per HCTM (max. 270)</b>	<b>At least once a MONTH</b>	<b>At least once a WEEK</b>	<b>At least once a DAY</b>
<b>Doctor (All)</b>	269	99.6%	94.1%	77.4%
<b>Doctor - Hospital</b>	269	99.3%	93.3%	77.4%
<b>Dispenser/Technician</b>	270	98.9%	98.5%	91.5%
<b>Nurse (All)</b>	269	98.5%	94.8%	87.0%
<b>Nurse - Hospital</b>	269	98.5%	94.8%	87.0%
<b>ACT</b>	269	97.8%	96.3%	88.5%
<b>Doctor - Consultant</b>	268	97.8%	84.7%	39.9%
<b>Doctor - Registrar (ST1-3)</b>	269	94.8%	88.5%	52.4%
<b>Doctor - Junior (FY1/FY2)</b>	268	92.5%	84.3%	70.5%
<b>Pre-registration Pharmacist</b>	268	90.3%	82.1%	51.9%
<b>Pharmacist - Community</b>	269	82.2%	37.2%	2.2%
<b>GP receptionist</b>	269	79.2%	61.3%	22.3%
<b>Nurse - Community</b>	268	66.4%	38.8%	3.0%
<b>Pharmacist - Primary care</b>	268	62.7%	27.6%	4.5%
<b>Dietician</b>	269	62.5%	30.5%	7.1%
<b>GP</b>	268	53.4%	20.5%	3.7%
<b>Care home staff</b>	270	50.4%	12.2%	0.4%
<b>Physiotherapist</b>	267	46.4%	22.8%	6.4%
<b>Occupational therapist</b>	267	39.3%	20.6%	5.6%
<b>Medicines counter/ Healthcare assistant</b>	265	37.7%	23.4%	14.7%
<b>Midwife</b>	268	35.8%	15.3%	1.9%
<b>Drug and alcohol team</b>	270	32.2%	8.5%	0.4%
<b>Social worker</b>	269	23.0%	7.1%	0.4%
<b>Speech and language therapist</b>	270	19.6%	6.7%	0.4%
<b>GP practice manager</b>	269	16.7%	6.3%	0.7%
<b>Paramedic</b>	266	12.4%	2.6%	0
<b>Radiographer</b>	267	9.7%	6.0%	2.2%
<b>Health visitor</b>	269	5.2%	0.7%	0
<b>Dentist</b>	269	4.1%	1.1%	0
<b>Podiatrist</b>	266	4.1%	0	0
<b>Opticians</b>	270	1.1%	0.4%	0
<b>Vet</b>	266	0.4%	0	0



**Figure 6.5.** Percentage of hospital pharmacists interacting with HCTMs at least once a month/week, ordered by at least once a month

### 6.3.1.3.1. Additional professionals which respondent reported they interact with

Beyond the 29 HCTMs listed in the questionnaire, a number of respondents reported interactions they had with 'other' HCTMs. **Table 6.5** shows the additional 33 HCTMs respondents reported interacting with at least once a month.

**Table 6.5.** Number of respondents interacting at least once a month with additional HCTMs stated in 'other' category of the questionnaire

HCTM (n=33)	Number of participants
'Specialist' nurses	15
Clerical staff	11
Assistant technical officer	6
Hospital doctor	
Other hospital pharmacists	
Healthcare support worker/ nurse auxiliaries	5
Managers	
Domestics/ housekeeping	4
Lecturers/ tutors	
Pathology	
Drug company employees	3
Microbiologists	
Porters	
Public health staff	
<u>Eight HCTMs including:</u> Psychologist, Nurse director, Medical director, Occupational therapy technician, Finance, Medical receptionists/ secretaries, Service improvement facilitators, Biochemists	2
<u>Eleven HCTMs including:</u> Play specialist, MHRA staff, Immunisation coordinator, Hospital smoke free counsellor, Informatics NWIS staff, NHS England patient safety head, Welsh assembly staff, Clinical coding staff, Haematology staff, Human resources staff, Phlebotomist	1

### 6.3.1.4. Impact of demographic characteristics on respondents' reported frequency of interactions with HCTMs

The questionnaire was used to capture a number of demographic characteristics of the respondents. Statistical analysis using the chi-squared test was undertaken (significance was set at  $p < 0.05$ ) to determine if any of these characteristics correlated with reported frequency of interaction with HCTMs. A number of characteristics did not meet the criteria necessary to undertake a chi-squared test. These included a comparison of the reported frequency of interaction against (i) respondent's health board; (ii) their primary specialism and (iii) the environment in which the respondent primarily practised. Analysis was however conducted to determine whether the frequency of reported interprofessional

interactions correlated with either the size of the hospital the respondent worked in or their professional grading.

#### 6.3.1.4.1. Impact of the respondents' professional grading (NHS banding) on their frequency of interactions with HCTMs

It was hypothesised that the seniority of pharmacists may increase their interactions with other HCTMs as they may have more experience and knowledge about professional roles. The data captured did suggest that pharmacists at lower grades reported that their primary work environment was on the ward whilst for those at band 8 and above tended to primarily work in an office environment (see **Table 6.6**).

**Table 6.6.** A comparison between the hospital pharmacists' professional grading (NHS banding) and their primary working environment within the hospital

Banding	Ward	Dispensary	Aseptic	Office based	Total
<b>Band 6</b>	38 95.0%	1 2.5%	1 2.5%	0 0%	40 17.8%
<b>Band 7</b>	26 78.8%	2 6.1%	1 3.0%	4 12.1%	33 14.7%
<b>Band 8</b>	74 48.7%	8 5.3%	10 6.6%	60 39.5%	152 67.5%
<b>Total</b>	138 61.3%	11 4.9%	12 5.3%	64 28.4%	225 100%

Chi-squared analysis of NHS band against reported frequency of interaction revealed that there was a significant difference ( $p < 0.05$ ) for 16 of the 29 HCTMs listed in the questionnaire; (Band 9 ( $n=1$ ) and Band 5 ( $n=4$ ) pharmacists were excluded from the analysis as their numbers did not meet the threshold for chi-squared analysis). Visual comparisons of the data (in which data was visually compared by the PhD research and confirmed by the supervisory team to determine which demographic group worked most frequently with a HCTM when significant differences were found – see chapter 4.3.9 for further explanation and other examples such of this process such as chapter 5.3.1.4) for these 16 professions indicated that senior pharmacists (band 8) were seen to have increased levels of interaction with consultants ( $p=0.005$ ), the paramedics ( $p=0.041$ ) and radiographers ( $p=0.044$ ). Pharmacists at lower bands (6 and 7) were determined to have significantly more frequent interactions with the thirteen remaining HCTMs. It was found that band 6 pharmacists had the most frequent level of interaction with ACTs ( $p=0.003$ ), care home staff ( $p=0.001$ ), community pharmacists ( $p=0.003$ ), dietician ( $p=0.006$ ), the drug and alcohol team ( $p= 0.008$ ), GP receptionists ( $p=0.000$ ), hospital nurses ( $p=0.003$ ), junior

doctors ( $p=0.005$ ), pre-registration pharmacists ( $p=0.002$ ) and speech and language therapist ( $p=0.003$ ). For band 7 pharmacists the most frequent level of interaction when compared to other bands was with community nurses ( $p=0.024$ ), occupational therapists ( $p=0.028$ ), and vets ( $p=0.039$ ).

#### **6.3.1.4.2. Impact of the size of the hospital on respondents' frequency of interactions with HCTMs**

The respondents in this study worked in hospitals of varying sizes related to the number of beds. It was hypothesised that the size of the hospital may impact on the number of HCTMs present in the hospital with for example a wider range of services and specialism in larger tertiary hospitals compared to smaller general hospitals. This may in turn impact at least on the opportunity for interprofessional interactions particularly given the findings in chapter 5 and in Jenkins et al., 2016 that demonstrated a positive correlation between co-location and frequency of interactions. A chi-squared analysis was therefore conducted to analyse the impact of hospital size on reported frequencies of interprofessional interactions; hospitals were categorized into three groups: (i) fewer than 499 beds, (ii) 500 to 700 beds, (iii) more than 700 beds. A validation step was undertaken to ensure that there was an even distribution of pharmacists by band (6, 7 and 8) across these hospital categories as this was shown to significantly impact on frequency of interaction (see 6.3.1.4.1).

Of the 29 HCTMs compared, seven were found to have statistically significant difference ( $p < 0.05$ ) between the sizes of hospitals. Of note, for six of the seven HCTMs where a significant difference was found, increased interactions were seen for the smaller hospitals rather than the larger hospitals when conducting visual comparisons of this data. These six HCTMs were: with hospital nurses ( $p=0.04$ ), midwives ( $p=0.009$ ), pre-registration pharmacists ( $p=0.000$ ), primary care pharmacists ( $p=0.013$ ), speech and language therapists ( $p=0.033$ ), and vets ( $p=0.001$ ). The only HCTM where working in a larger hospital (more than 700 beds) resulted in reports of more frequent interactions was with dieticians ( $p=0.006$ ).

#### **6.3.1.5. Description of the qualitative comments provided within the questionnaire**

The final section of the questionnaire provided a free text comments box for respondents to add any further information they deemed appropriate to the study. A total of 20 of the 270 respondents made comments. The raw data is presented in Appendix T and the information was used to inform stage two of this study i.e. the semi-structured interviews.

### **6.3.2. Stage two – Semi-structured interviews exploring the nature of interprofessional interactions between hospital pharmacists and healthcare professionals**

This section describes the results for the qualitative interviews with hospital pharmacists which aimed to explore and better understand the IPIs taking place as pharmacists practise in hospitals and to determine the value pharmacists place on interprofessional education.

#### **6.3.2.1. Participant demographics**

In this study, 15 interviews were conducted at which point the sample represented a sufficient cross section of hospital pharmacists, constant comparison indicated strong repetition of data and themes, and the study aims had been achieved (Bowen, 2008; King and Horrocks, 2010a; Malterud et al., 2015). **Table 6.7** details the demographic characteristics of participants; in order to maintain anonymity the hospital and health board each participant works in has been excluded. In total participants were recruited from five different hospitals associated with four of the five Welsh LHBs eligible for this study: (i) Abertawe Bro Morgannwg University Health Board (UHB) (n=6); (ii) Betsi Cadwaladr UHB (n=2); (iii) Cardiff and Vale UHB (n=3); (iv) Cwm Taf UHB (n=4). Participants were not recruited from the fifth LHB (Hywel Dda UHB) and Velindre hospital primarily due to limited response from potential participants, geographical convenience, limited time to conduct the study and the conclusion that strong repetition of data and study aims had already been achieved.

Consideration of each participants' specific demographic characteristics was important during the thematic analysis of interviews, particularly those that were seen to directly impact pharmacists' frequency of interactions determined within the questionnaire such as the professional grade and primary working environment (see section 6.3.1.4). Having awareness of participants' primary specialism and their community pharmacy experience was also important as these factors were seen to influence interactions. However, throughout the interviews there was little evidence that the hospital size and LHB directly impacted participants IPIs.

The university that participants attended and the year that they qualified impacted on the undergraduate IPE that they had experienced. Participants that had graduated more recently and generally been exposed to more IPE during undergraduate studies probably as a consequence of the expansion of IPE in the MPharm programme in recent years as

described in chapter 3, they also generally had a better recollection of the specific IPE they undertook.

For those participants who described having engaged in postgraduate IPE, this was often during the pre-registration year or as part of a postgraduate clinical diploma. In the main, these sessions were often described as either training/learning alongside another HCP(s) about a certain topic, teaching conducted by another professional (often medics) or a teaching session about the topic of interprofessional working. The sessions described rarely featured pharmacists directly working alongside other HCPs; *“when I first took up the role in stroke there is a [name] accredited two day understanding stroke care course which everybody new to stroke has to go on this course and each service has someone from theirs giving a talk about their role and what to expect from a stroke patient, so it’s not directly working with them but its understanding what they do”* (P8). One participant (P4) did state how they undertook a formal IPE session with doctors and nurses at postgraduate level within the hospital. Another participant (P9) also delivered postgraduate IPE for pre-registration pharmacists, newly qualified doctors, nurses and midwives. Four others delivered teaching to other HCPs on a non-medical prescribing course, medicine course and to qualified HCPs on specific topics such as antimicrobial and renal medications.

**Table 6.7.** Descriptive demographic characteristics of each hospital pharmacist interview participant showing the range of personal experiences and pharmacy locations

<b>Participant no'</b>	<b>Year registered</b>	<b>University of study (Cardiff or another UK Uni)</b>	<b>Previous IPE experience</b>	<b>Area of Pre-registration training</b>	<b>Years worked within the hospital</b>	<b>Specialism (current rotation in brackets)</b>	<b>Community pharmacy experience</b>	<b>Professional grading / NHS band</b>
<b>P1</b>	2014	Cardiff	Yes (UG)	Hospital	4	Cardiac	No	7
<b>P2</b>	2012	Cardiff	Yes (PG)	Hospital	3	Renal	Yes	7
<b>P3</b>	2016	Cardiff	Yes (UG)	Hospital	2	Rotational (renal)	No	6
<b>P4</b>	2017	Cardiff	Yes (UG + PG)	Hospital	0.25	Rotational (surgery)	No	6
<b>P5</b>	1980	Other	Yes (UG + PG)	Hospital	15	Renal	No	8
<b>P6</b>	2016	Cardiff	Yes (UG)	Hospital	2	Rotational (general medicine)	No	6
<b>P7</b>	2013	Cardiff	No	Hospital	2.5	Rotational (admissions + ITU)	No	7
<b>P8</b>	2005	Cardiff	Yes (PG)	Hospital	12	Stroke	Yes	8
<b>P9</b>	2000	Cardiff	Yes (PG + also delivers IPE)	Community	15	Women's health + dispensary	Yes	8
<b>P10</b>	2007	Cardiff	No	Hospital	3	Admissions + E&T	Yes	8
<b>P11</b>	2017	Cardiff	Yes (UG)	Hospital	1.25	MI + surgery	No	6
<b>P12</b>	2015	Cardiff	Yes (UG)	Hospital	3.25	Rotational (surgery)	No	7
<b>P13</b>	2010	Other	Yes (UG + PG)	Hospital	7	Pharmacovigilance + MI + transplant		8
<b>P14</b>	2014	Other	Yes (UG + PG)	Community	0.25	Rotational (admissions)	Yes	6
<b>P15</b>	2010	Cardiff	No	Hospital	7	Antimicrobial	Yes	8

LJM = Liverpool John Moores, UG = undergraduate, PG = postgraduate, MI = Medicines information, ITU = Intensive care unit, E&amp;T = Education and training

### 6.3.2.2. Deductive data

Deductive thematic analysis was employed to identify: (i) participants' frequency of interactions with other HCPs; (ii) the nature of participants' interprofessional interactions; (iii) the mode with which the interactions occurred; (iv) any areas where participants learnt from other HCPs during interactions; (v) the topics participants would like to learn from other HCPs; (vi) participants' suggestions for the design and implementation of IPE. All participants understood the term 'interprofessional interactions' to be broadly "*communicating and working with other healthcare professionals to achieve a common goal for the patient*" (P4).

#### 6.3.2.2.1. Participants' reported frequency of interactions with healthcare professions

During the initial part of the interview, participants were asked to rank fifteen HCPs based on their perceived frequency of interaction with each HCP. Those which the participant felt they did not interact with at all could be discarded. **Table 6.9** shows the rank order of each participants' frequency of interaction with the HCPs included in the exercise. This ranking process was often influenced by the professional grading of participants with those more senior pharmacists such as P5 (band 8) stating they interacted with a large number of HCP, in this case 13 out of the 15 HCPs given to rank, and junior pharmacists such as P11 (band 6) stating they interacted with just 2 of the 15 HCPs (doctors and nurses). In addition to the ranking exercise, throughout the interviews where a participant discussed a particular HCP, they were asked to quantify their frequency of interaction with that HCP (see **Table 6.8**).

In common with findings from the questionnaire phase of this study (see section 6.2), the data showed that participants interact most frequently with hospital-based doctors and nurses. All fifteen participants reported that they interact on a daily basis with doctors and nurses and ranked them both as either their first or second most frequently interacted with HCP; "*I interact with doctors most frequently and if anything nurses would be a close second*" (P14), "*them (nurses) and the doctors are the main ones I will speak to every day most of the day*" (P1). The impact of co-location was also evident as during the ranking exercise, interactions with the community-based doctors (GPs) and nurses were much less frequent, with some participants failing to state any level of interaction with these professions.

All participants bar one included dieticians during the ranking exercise with participants indicating that they were their third most frequently interacted with HCP. Seven participants stated they had weekly interactions with dieticians and four of these indicated

interactions were on a daily basis. None of the participants reported that they interact with dieticians in the primary or community sector. Physiotherapists (physios), speech and language therapists (SALT) occupational therapists (OTs) and midwives also featured during some participant's ranking exercise; for some participants they represented their third most frequent source of interprofessional interactions. However, interestingly a number of participants did not acknowledge any interaction with these professions. This variation in the scope of interactions was often explained by the participant as a consequence of their particular specialism or working environment, or their experience as a practitioner.

Beyond the ranking exercise, participants were asked more generally about their own perceptions of the frequency with which they interact with other HCPs. In total eight participants felt they had the right number of interactions, with one participant (P5) indicating that on occasions, the level of interactions was sufficient to distract them from their own service delivery; *"way too much, ha... sometimes you do need those boundaries so that you can concentrate on your own service delivery as well"*. The other six participants felt they could, and would like to, undertake more interactions as they recognised the benefits, however some felt they needed to overcome barriers to achieve this; *"I think there are so many benefits to more joined up working and interprofessional working so I don't think you can ever have too much so I think the more the better really"* (P10), *"I would say I would like a bit more, just to try and get more comfortable really to knock down any barriers really"* (P14).

**Table 6.8.** The frequency of interaction hospital pharmacist participants (max. n=15) stated they had with HCPs

<b>Healthcare Professional</b>	<b>At least once a day</b>	<b>At least once a week</b>	<b>At least once a month<sup>^</sup></b>	<b>At least once a year<sup>^^</sup></b>	<b>Less frequently<sup>^^^</sup></b>
<b>Hospital Doctor (n=15)</b>	15	-	-	-	-
<b>Hospital Nurse (n=15)</b>	15	-	-	-	-
<b>Dietician (n=10)</b>	4	3	-	2	1
<b>Physio (n=7)</b>	2	2	-	2	1
<b>OT (n=7)</b>	1	1	1	4	-
<b>SALT (n=5)</b>	-	1	2	2	-
<b>SW (n=5)</b>	-	1	1	2	1
<b>Radiographer (n=4)</b>	-	-	1	1	2
<b>GP (n=2)</b>	-	1	-	1	-
<b>Community Nurse (n=2)</b>	-	1	-	1	-
<b>Midwife (n=2)</b>	-	1	-	-	1
<b>Dentist (n=1)</b>	-	1	-	-	-
<b>Optician (n=1)</b>	-	-	1	-	-
<b>Paramedic (n=1)</b>	-	-	1	-	-

<sup>^</sup>The term occasionally was categorised as 'at least once a month' frequency

<sup>^^</sup> The terms not often and rarely were categorised as 'at least once a year' frequency,

<sup>^^^</sup> The term (very) very rarely was categorised as 'less frequently' frequency

**Table 6.9.** The relative ranking hospital pharmacist participants indicated with respect to the level of interaction with fifteen HCPs provided during the ranking exercise; data are provided in descending order i.e. the HCP with which the participant reported interacting most frequently are at the top

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
Nurse	Nurse	Doctor	Doctor	Doctor	Nurse	Doctor	Nurse	Doctor	Doctor	Doctor	Nurse	Nurse	Doctor	Doctor
Doctor	Doctor	Nurse	Nurse	Nurse	Doctor	Nurse	Doctor	Nurse	Nurse	Nurse	Doctor	Doctor	Nurse	Nurse
Physio.	Diet.	Physio.	Diet.	Diet.	Diet.	Diet.	SALT	Midwife	Midwife		OT	OT	Physio.	Diet.
Diet.	Physio.	SW	Physio.	Physio.	OT	Physio.	Diet.	Dentist	Diet.		Diet.	SW	Diet.	Midwife
OT	OT	OT	HV	SW	SALT	Midwife	OT	Diet.	Physio.		SALT	SALT	Para.	
SALT	SW	Diet.		Para.		Dentist	Physio.	Para.	OT		Physio.	Diet.	SW	
Radio.	SALT	Radio.		Pod.		SALT	SW	Pod.	SALT		Midwife	Midwife		
Midwife	Radio.			Radio.		SW	Optician	SALT	Para.		Dentist	Dentist		
				Optician		OT		Radio.	SW		Radio.	Physio.		
				HV					HV		HV	HV		
				SALT					Optician			Para.		
				OT					Pod.					
				Dentist					Dentist					

Diet. = Dietician, HV = Health visitor, OT = Occupational therapist, Para. = Paramedic, Physio. = Physiotherapist, Radio. = Radiographer, SW = Social worker, SALT = Speech and language therapist

#### 6.3.2.2.1.1. Other professions of note

Participant 5 was keen to point out that engagement is needed with a vast array of team members outside of those that might be termed direct medical professionals. Interactions with technical staff, secretaries, research colleagues, drug companies and private organisations (for procurement, treatment protocols and service delivery), IT engineers and patient representatives/bodies (to help design services) were all mentioned as important stakeholders to deliver a successful care service. In addition, P5 also commented that *“the most obvious one that is missing to me from here is the patient, and again it just highlights how we develop the services around systems and not the individuals that are using it”*. P9 also suggested that they had interactions with pathology and microbiology staff for culture sensitivities and antibiotic choice.

#### 6.3.2.2.2. Participants’ mode of interaction with other HCPs

Participants reported mode of interaction with each HCP was determined during the interviews and is presented in **Table 6.10**. Interactions could generally be categorised into three modes: (i) face-to-face; (ii) over the telephone and (iii) interactions where written communication was used, e.g. medical notes or by email. A number of participants used a blend of these mechanisms during their engagements with different HCPs, however face-to-face communication was the most common mechanism of interaction used in 53 of the 55 secondary care HCP IPIs described across the interviews. Face-to-face interaction was often said to be as a consequence of both professions being physically present, particularly on the wards and within ward rounds. In this regard, certain HCPs were seen to be more readily available for face-to-face interactions such as nurses and junior doctors, with other HCPs such as senior doctors being available more infrequently, resulting in a potential barrier to face-to-face interactions (see section 6.2.2.3.4).

Where interactions with secondary care HCPs were not face-to-face it was often explained that this was due to the pharmacists being ‘off the ward’ in either the dispensary or offices, or the that the HCP they needed to get hold of was not readily accessible on the ward at that time. In this case the participants often phoned HCPs, or in certain cases used email. A number of participants suggested how this could be challenging as they didn’t always know how to contact another HCP. Another method that was used to communicate with HCPs was through written notes in patients’ medical records. In the main, this was often a practice of more junior pharmacists, with many participants recognising that face-to-face was the

preferable mechanism for interaction. One participant also used video conferencing with consultants and other HCPs to interact remotely across different geographical locations.

Interactions with HCPs based within primary care were exclusively by telephone with the exception of one senior participant who described a face-to-face educational session. One participant also mentioned the 'broker' role of the GP receptionist, a theme identified during the community pharmacist interviews (see chapter 5). A number of participants also described who generally initiated the interactions. In interactions with doctors, of the eight who commented, six suggested that it was the pharmacist that generally initiated the interactions. The other two participants felt that it was an even mix between the professions, with both approaching one another regularly. This sense of a shared approach to initiating interactions was a common theme in terms of interactions with nurses, with eight of twelve participants indicating that interactions were as frequently initiated by nurses as by pharmacists. Four participants did not share this view, they indicated that nurses were more likely to approach the pharmacist.

**Table 6.10.** A comparison of hospital pharmacist participants' (max. n=15) modes of communication with different HCPs

HCP	Face-to-face only	Face-to-face and telephone	Face-to-face and written	Face-to-face and telephone, and written	Telephone only
<b>Hospital Nurse</b> (n=15)	7	4	1	2	1
<b>Hospital Doctor</b> (n=14)	4*	4	-	6	-
<b>Dietician</b> (n=10)	9	-	1	-	-
<b>GP</b> (n=6)	-	1	-	-	5
<b>OT</b> (n=6)	4	-	1	-	1
<b>Community Nurse</b> (n=4)	-	1	-	-	3
<b>SW</b> (n=4)	2	1	-	-	-
<b>Physio</b> (n=3)	3	-	-	-	-
<b>SALT</b> (n=2)	2	-	-	-	-
<b>Dentist</b> (n=1)	-	-	-	-	1
<b>Midwife</b> (n=1)	1	-	-	-	-
<b>Paramedic</b> (n=1)	1	-	-	-	-

\* = one also included video conferencing

### 6.3.2.2.3. The nature of participants' interactions with other HCPs

The nature of participants' interactions with HCPs broadly fell into two categories, 'clinical' interactions and 'practical' interactions. Clinical interactions were defined as those

occasions where the pharmacist and HCP engaged to discuss clinical situations in order to benefit/enhance the clinical care provided to patients. Examples would include discussions about drug doses, administration, interactions, etc. Practical interactions were defined as occasions where there was interaction with a HCP to discuss non-clinical, practical or logistical patient issues, such as the supply of medications or governance issues. The nature of participants' interactions with various HCPs was deduced from the interviews and is presented in **Tables 6.11a-c**.

It was evident from the data that interactions with hospital doctors were predominately focused on clinical issues such as appropriateness of medicines particularly in areas such as dosing, interactions, formulation, indication, and biochemical results (see **Table 6.11a**). There was some focus on discharging patients. These were in part practical discussions about discharge but also clinical discussions focused on *"making sure that medications are suitable for discharge"* (P13). Guidelines were sometimes used to frame clinical discussion; *"they prescribe what they think is appropriate but according to our antibiotic guidelines not necessarily appropriate"* (P1). Although interactions with General Practitioner (GPs) were sometimes clinical in nature (see **Table 6.11b**), P5 stated how *"the interactions are very different"* between the sectors, with P14 believing that *"within community it is a bit more straightforward"* and interactions in hospital are more complex. GP interactions were primarily focused on the communication of patient medication information on either admission or discharge to hospital and providing advice where necessary.

Unlike doctors where interactions were mainly clinical, pharmacists were seen to interact with hospital nurses for both clinical and practical reasons (see **Table 6.11a**). This was summarised by P9; *"nurses tend to know more about the patients (compared to other HCPs), so if you want to know something about the patients themselves, whether they still take a medication or whether they have stopped, what their blood pressure has been like since they have been in, whether their next INR appointment has been booked, all that sort of stuff the nurses are a wealth of information.. so we rely on them a lot actually"*. One topic of interaction all fifteen participants engaged with nurses about was the administration of medicines as drug compatibility in IV lines and a patient's ability to swallow had impact on both practitioners scope of practice; *"speak to nurses we are giving advice on administering things which improves patient safety"* (P1). Patient discharge was another common area of discussion between pharmacists and nurses. However, unlike the clinical discussions in this area with doctors, interactions were more focused on practical issues associated with getting patients home; *"they are more pressured to get patients out so they would contact us"*

*more about whether prescriptions are done” (P6). Interactions with community nurses also involved patient discharge however these interactions had a greater focus on ensuring the nurses were aware of the medications they needed to administer and the clinical impact of this (see **Table 6.11b**). One common theme was engaging with nurses who run warfarin clinics. Pharmacists engaged with these practitioners to determine doses and INR levels, and arrange appointments on discharge; *“INR clinic appointments, issues with peoples’ warfarin, we have contacted nurses for that outside (of the hospital)” (P9).**

The nature of interactions with nurses tended to be dependent on the seniority of the nurse. Participants interacted with senior nurse practitioners (including specialist nurse prescribers and sister) about their specialist area of expertise and often utilised their prescribing skills as it was felt it was easier to interact with them rather than getting hold of doctors (see **Table 6.11b**); *“we’ve actually got loads of nurses pracs who do the prescribing, they are very, very handy when you can’t get hold of a doctor and because of the fact they have the nursing background as well as the prescribing background they are very very good” (P1).* Practical interactions also occurred with senior nurses, particularly ‘sisters’, about issues such as discussing incidents and checking controlled drug (CD) levels. Four participants indicated that they interacted with nurses of all seniority levels including nursing assistants; *“often they (nursing assistants) can tell you quite a bit about the patient, obviously not medication wise but if there is anything they wanted, erm, what diet are they on for example, so I can tailor the medicines administration to that” (P8).*

Interactions with dieticians primarily involved discussions on the clinical use of total parenteral nutrition (TPN) and practical implications thereof (see **Table 6.11b**). This included discussions on the use of nasogastric (NG) and percutaneous endoscopic gastrostomy (PEG) tubes in patients; *“you would speak to the dietician is if someone has been started or is currently on TPN” (P2).* Participants also discussed with dieticians the management of patients’ electrolytes (such as potassium and sodium) and tailoring patients dietary and medication needs to account for these blood results as well as the holistic care of the patient; *“every dialysis patient that I see is joint with a dietician because these patients come with sodium restrictions, potassium restrictions, phosphate restrictions, fluid restrictions ... dietician goes through the patients typical diet... I can tailor drug therapy” (P5).* Practical engagement surrounding the stock and supply of dietary feeds also occurred.

Interactions with physiotherapists appeared to focus primarily on pharmacists providing medication advice in areas such as pain management and cystic fibrosis, and the

physiotherapists informing pharmacists of patients with dexterity/mobility problems which could impact medication choice (see **Table 6.11b**). One participant also believed that the physiotherapist's knowledge overlapped with OTs as they both had good overall knowledge of the patients; *"OTs tend to have, and the physios, they sort of know the whole picture, what's the family background, what's the living status of the patient..."* (P8). OTs were also found to be helpful in recognising patients who had difficulties in taking medications and thus interacted with pharmacists with respect to compliance aids, particularly on patient discharge, with a number of participants believing that OTs, along with social workers (SWs), could help improve these discharges; *"I think that interaction between social workers and occupational health could probably be improved, and if it was improved we would have smoother discharges"* (P7), *"making sure that they are able to take their medications appropriately when they are going home and thinking about whether they need a blister pack (compliance aid) and that sort of thing and it is usually the OTs and the social workers who might be involved"* (P13). Interactions with SALT mainly concerned the patient's ability to take medications with SALTs informing pharmacists about patients for example with swallowing difficulties. Pharmacists were then able to advise on suitable formulations; *"obviously if they (SALT) deem the patient nil-by-mouth then it is an NG tube so that again is for us to determine how they administer the meds"* (P8). Reasons for IPIs with these HCPs can be found in **Table 6.11c**.

A number of participants suggested that interactions with midwives were similar to those with hospital nurses; *"it would be quite a similar interaction to how I would rate the nurses interaction"* (P10). They were also found to be a good source of general patient information, particularly in relation to pregnancy and breastfeeding and the use of medicines in such patients. Whilst a number of practical interactions were listed with midwives (see **Table 6.12c**) these were all suggested by one participant (P9) as they were the lead pharmacist for 'obstetrics and gynecology' and therefore involved in a range of practice and policy work with midwives; *"I am involved in all of the procedure writing, so any maternity procedures that involved medicines"* (P9). Just two participants described their interactions with dentists and these were focused on dental prescriptions received into the dispensary. Interactions with other professions that are detailed in **Table 6.12c** (opticians, paramedics, podiatrists, radiographer, vets and ambulance staff) were all attributed to a single participant and were generally described as rare (see section 6.3.2.2.1), for practical reasons (such as weekly medication collection by paramedics), or indirect (i.e. through referral of patients to the optician service).

**Table 6.11.a.** *The reasons pharmacists reported interacting with HCPs, categorised as either ‘clinical’ or ‘practical’ interactions. ‘n =’ refers to the number times each reason was raised across the 15 interviews*

HCP (number of participants who commented)	<b>‘Clinical’ interactions (interactions about clinical scenarios to benefit clinical patient care)</b>	<b>‘Practical’ interactions (interactions about non-clinical, practical or logistical patient issues)</b>
<b>Hospital doctor</b> (n=15)	Medication appropriateness/choice (n=7), Medication issues/clarification (n=7), Appropriateness of medication dose (n=7), Patient discharge (n=7), Medication monitoring/blood levels (n=6), Prescribing errors (n=6), Medication interactions (n=6), Medication guidelines (n=5), Patient care plans (n=5), Prescribing in patients with poor renal function (n=4), Discussions about patient blood results (n=4), Prescribing for specific indications (n=3), Prescribing of new drugs (n=3), Discussions about medications the pharmacist is not comfortable with (n=3), Discussions about patients mineral/electrolyte levels and if replacement needed (n=2), Antibiotic stewardship (n=2), Switching formulation/route of medications (n=2), Medicines reconciliation (n=2), Side effects (n=1), Contraindications (n=1), Requesting blood levels (n=1), Allergies (n=1), Day-to-day patient management (n=1), Uncharted medications (n=1), Prescribing outside of guidelines (n=1), Patient non-compliant (n=1)	Medication stock/supply (n=3), Clinical Governance (n=3), Audits/research (n=1), When doctors oversee prescribing course (n=1), Risk management (n=1), Staff management (n=1), Policies and procedures (n=1), Finances (n=1), Designing/planning services (n=1), When pharmacist oversees some junior doctors training (n=1), Informing doctors of prescribing the pharmacist has conducted (n=1)
<b>Hospital nurse</b> (n=15)	Medication administration (how to give, swallowing difficulties, IV rates etc) (n=15), Patient information (how coping/weight etc) (n=12), Medication information and advice (n=5), Patient care plans (n=3), Patients social history (n=3), New/changes to medications (n=3), Whether drugs have been given (n=3), Compliance aids (n=2), Drug chart issues (n=1), Nurses to prescribe when can’t get hold of doctors (n=1), Consultant preferences for medications (n=1), Patients blood pressure (n=1), Clinical discussions (n=1), Side effects (n=1)	Patient discharges (n=9), Medication stock/supply (n=7), Arranging bloods to be done for drug monitoring/electrolytes etc (n=6), Controlled drug checks/issues (n=4), Ward governance (n=1), Referring to specialist medical teams (n=1), Weighing patients (n=1)

**Table 6.11.b.** The reasons pharmacists reported interacting with HCPs, categorised as either 'clinical' or 'practical' interactions. 'n =' refers to the number times each reason was raised across the 15 interviews

HCP (number of participants who commented)	'Clinical' interactions (interactions about clinical scenarios to benefit clinical patient care)	'Practical' interactions (interactions about non-clinical, practical or logistical patient issues)
<b>Dietician</b> (n=15)	Total parenteral nutrition (n=13), Mineral/electrolyte levels (n=6), Tailoring patients' diet/medication (n=5), Patient feeding/refeeding (n=4), Medication administration (swallowing etc.) (n=3), Ward rounds for specific diseases (n=2), Dietary supplements (n=1), Patient non-compliance (n=1)	NG/PEG tubes (n=6), Dietary medication stock/supply (n=3), Diet gets pharmacist to pass on information to doctors (n=1)
<b>General Practitioner</b> (GP) (n=14)	Medicines reconciliations (n=6), Relaying information on discharge (n=4), Medicines information queries (n=3), Similar to hospital doctor engagement about medications (n=3), Medication/prescribing advice to GP (n=2), Antibiotic courses (n=2), Guidelines (n=2), Medication formulary (expensive items)(n=1), Patient information from GP (n=1), Compliance aids (n=1)	Administrative role between GP and HCP (n=1)
<b>Community nurse</b> (n=10)	Warfarin appointments/levels (n=3), Patient discharges (n=3), MI queries (n=2), Patient care packages (n=2), Compliance aid (n=2), Vaccinations (n=1), Insulin doses (n=1)	Medications given on discharges community nurses need to administer (n=3), Stock/supply of medications (n=2), Sending medication charts (n=1), Getting blood samples (n=1)
<b>Physiotherapists</b> (Physio) (n=7)	Medication information (n=4), Patient mobility/dexterity (n=3), Patient discharges (n=1), Patient social history (n=1), Pain management (n=1), Cramps/restless leg (n=1), Cystic fibrosis patients (n=1), Nebulisers (n=1)	
<b>Senior nurse practitioners</b> (n=7)	Specialist clinical knowledge (n=4), Prescribing (n=3), Patient discharges (n=1), General patient information (n=1), Patient non-compliance (n=1)	Incidents/investigations (n=2), Controlled drug checks (n=1), Clinical governance (n=1), Ward logistics (n=1)

**Table 6.11.c.** The reasons pharmacists reported interacting with HCPs, categorised as either 'clinical' or 'practical' interactions. 'n =' refers to the number times each reason was raised across the 15 interviews

HCP (number of participants who commented)	'Clinical' interactions (interactions about clinical scenarios to benefit clinical patient care)	'Practical' interactions (interactions about non-clinical, practical or logistical patient issues)
<b>Social worker</b> (n=6)	Non-compliant patients (n=3), Patients discharged with social care package (n=3), Patients social history (n=1), Medication reconciliation (n=1), Addiction patients (n=1)	
<b>Speech and language therapist</b> (n=6)	Patient medication access (swallowing difficulties, NGs etc.)(n=6), Crushing medications (n=2), Food supplements on discharge (n=1)	
<b>Occupational therapist</b> (n=6)	Patients with difficulties taking medications (n=6), Compliance aids (n=4), Complex discharge (n=2), Patient social history (n=2), Medication issues (n=1)	
<b>Midwives</b> (n=4)	Similar interactions to nurses (n=3), Medication in pregnancy/ breast feeding (n=2), General patient discussions (n=2), Medications management/queries (n=2)	Clinical governance (n=2), Errors and prevention (n=1), Medication storage (n=1), Patient groups directions (n=1), Ward planning (n=1)
<b>Dentist</b> (n=2)	Anticoagulation (n=1), Medication doses (n=1), non-formulary items (n=1)	Medication stock/supply (n=1)
<b>Nursing assistants</b> (n=2)	Patient care plan (n=1), Patient diet (n=1)	Weighing patients (n=1), Patient positioning (n=1)
<b>Paramedic</b> (n=1)		Collecting of medication (n=1)
<b>Ambulance staff</b> (n=1)		Logistics in transporting patients (n=1)
<b>Opticians</b> (n=1)	Patients with visual problems (indirect interactions)(n=1)	
<b>Podiatrist</b> (n=1)	Prescription issues (n=1)	
<b>Radiographer</b> (n=1)	Central line unblocking (n=1)	
<b>Vet</b> (n=1)	Animal medication overdose management (n=1)	

### 6.3.2.2.4. Participants' learning from other HCPs

Having recognised during the community pharmacist study (see chapter 5) that learning from other HCPs was a theme within the data, the hospital pharmacist interviews were deductively analysed to determine the topics which hospital pharmacists learnt from other HCPs; data is shown in **Table 6.12**.

**Table 6.12.** Identification of the topics of learning from HCPs that participants described

HCP (number of participants who commented)	Topic of learning
<b>Doctor</b> (n=14)	Medical examinations (n=6), Complex conditions (n=4), Medication evidence (specialist/new drugs)(n=4), Doctors perspective and approach (n=3), Guidelines/Evidence base (n=3), Acronyms (n=2), Diagnosis (n=2), Prescribing (n=2), Reading ECGs (n=2), Their background medical knowledge (n=2), Clinical areas (n=1), Clinical experience (n=1), Communication skills (with other HCPs/patients - leaders)(n=1), Difficult experiences (n=1), Improved assertiveness (n=1), Medical histories (n=1), Medications required/not in surgery (n=1), Physiology (n=1), Strategic management (n=1), Swallowing difficulties (n=1), Treatment courses (n=1)
<b>Nurse</b> (n=10)	Medical equipment use (e.g. ventilators, renal filters)(n=5), Physical administration of medications (n=5), Nurse perspective of patient care (holistic approach) (n=3), Delivery of services/care (n=2), Brand/old drug names (n=1), Communication (n=1), Consultant preferences (n=1), Prescribing (n=1), Specialist medical areas (n=1), Specialist medications (n=1)
<b>Dietician</b> (n=9)	Total parenteral nutrition (n=4), Dietary advice (n=2), Food impacting electrolytes (n=2), Refeeding (n=2), NG tube use (n=2), Patient feeds (n=1), Professional roles (n=1)
<b>Physio</b> (n=2)	Mobilisation of patients (n=2)
<b>Midwife</b> (n=2)	Gas and air use (n=1), Explanation of patient notes (n=1)
<b>SALT</b> (n=1)	Medication in patients with certain diets (n=1), Professional roles (n=1), Reasons why patients need certain diet (fluoroscopy) (n=1)

It was suggested within the interviews that pharmacists have a lot to learn from other HCPs; *"I think we have to learn from other specialities"* (P5), *"there is valuable information to get from all of them (HCPs)"* (P6). In total fourteen of the fifteen interview participants articulated that they had directly learnt from doctors most commonly about medical examinations (such as checking for signs of infection) and background evidence for medicines (such as discussing new clinical trial papers), with P14 believing interacting with doctors could be *"like (having) our own private lecturers"*. P12 also suggested that they learnt from difficult experiences they had when interacting with doctors.

Some participants felt that they learnt the most from senior staff, particularly senior doctors, *“a lot of these consultants and things have read a million journal articles for the same drug so they know everything, so I have learnt a lot from that”* (P7), with P15 suggesting that they hadn't learnt from junior doctors; *“not necessarily with the junior doctors, I think they benefit from us more than anything”*. However, P2 acknowledged that the seniority of nurses they learnt from corresponded with their own personal professional grading; *“I mean as a junior pharmacist I probably appreciated the band 5 nurses more in terms of learning... now I probably learn more off the specialist dialysis nurses because my work and my remit has extended more into seeing dialysis patients having other considerations for why erm effects may be occurring other than drugs, having a more holistic approach”* (P2).

The main areas participants were seen to learn from nurses related to the physical administration of medications and the use of medical equipment. Nine participants also indicated that they had learnt from dieticians, particularly in terms of total parenteral nutrition. Not all participants felt that they had learnt from dieticians, with some (n=4) directly stating this; *“I haven't really learnt anything from a dietician per say”* (P3). Additionally, beyond doctors, nurses and dieticians, occasions participants were found to have learnt from other HCPs was limited. However, some participants recognised that although they may have not directly learnt from a HCP, interactions prompted them to develop their learning in certain areas; *“I think yeah their role has pushed me towards learning things rather than learning things specifically from them”* (P6). It was also felt by P5 that being part of an interprofessional team can help the pharmacists develop as they can learn from other professions, especially with regards to soft skills such as patient communication; *“I think there is a lot of soft intelligence we gather from being part of the team”*. Furthermore, a number of participants felt they were able to directly apply the 'things' they learnt from other HCPs on future occasions.

In addition, many participants recognised the opportunity for reciprocity with other HCPs and indicated that they felt HCPs had learnt from the pharmacist; *“they are normally learning about the medication from us”* (P4). This was clearly the case for four participants who were directly involved in providing educational training to other HCPs (P5, P9, P10, P15). All four contributed to postgraduate training in different manners; yellowcard use (P10), antibiotic use (P15), prescribing and drug histories (medicines reconciliation) (P9) and medications use in patients with poor kidney function (P5). These sessions primarily involved doctors and nurses in both secondary and primary care, with P5 also teaching on the non-medical prescribing (NMP) course. With the exception of P10, all participants were

involved in undergraduate HCP teaching. This was mainly with respect to medical students, although P9 had also had experience in conducting IPE with medical, pharmacy and midwifery students.

Although participants recognised undertaking IPE as one way they learnt from other professions, there were also a number of other opportunities that were described including: (i) attending educational sessions ran by other HCPs; (ii) undertaking the non-medical prescribing course; (iii) attending a teaching session related to dealing with ‘difficult HCPs’ led by another pharmacist; (iv) attending a session about methods of interacting with doctors from a pharmacist-turned-doctor; (v) having other pharmacists/tutors encouraging interactions; (vi) attending lectures from all HCPs involved in specialism about roles and responsibilities when beginning new specialism; (vii) attending MDT meetings or clinics – ‘observational IPE’; (viii) spending time specifically shadowing other HCPs on wards (doctors and nurses); (ix) attending training led by other HCPs.

#### 6.3.2.2.5. Topics participants would like to learn from other HCPs

Participants were asked during the interview if there were any additional topics they would like to learn from HCPs. **Table 6.13** shows that doctors (especially senior doctors) were the profession that most participants indicated they would like to learn from and predominantly in improving clinical knowledge and diagnostic skills. One participant specified their senior pharmacist as the key person they would like to learn from. Two other participants felt that they would like to know more about the roles and responsibilities of dieticians and physiotherapists.

**Table 6.13.** Identification of the areas participants would like to learn from other HCPs

HCP (number of participants who commented)	Topic that participants would like to learn from HCPs
<b>Doctor</b> (n=5)	Reading ECGs (n=2), Cardiology (n=1), Diagnostics (n=1), Dialysis (n=1), Medical history taking (n=1), Medical/scientific writing (n=1), Microbiology (n=1), Minor ailments (n=1), Observe surgery (n=1), Prescribing (n=1), Reading brain scans (n=1), Therapy reasoning (n=1)
<b>Dietician</b> (n=1)	Roles and responsibilities (n=1)
<b>Physiotherapist</b> (n=1)	Roles and responsibilities - what they monitor and review with patients (n=1)
<b>Senior pharmacist</b> (n=1)	Leadership (n=1), NHS structure and funding (n=1)

### 6.3.2.2.6. Participants' suggestions for the design and implementation of IPE

During the interviews eight of the participants recognised a number of benefits to IPE including: (i) reducing barriers between HCPs; (ii) observing a different approach to dealing with issues and the provision of care; (iii) helping deal with confrontation from other HCPs; (iv) providing a formal environment to give feedback to one another (PG IPE); (v) appreciating and recognising roles and responsibilities of each HCP; (vi) improving soft skills such as communication; (vii) aiding the development of interprofessional relationships; (viii) helping improve attitudes towards the pharmacy profession.

Throughout the interviews participants provided a number of suggestions related to the implementation of IPE which have been summarised in **Table 6.14**. A number of participants believed that it was important to implement IPE with the professions most relevant to professional practice; *"I would include the people that you are more likely to come into contact with on the wards or in whichever sector of pharmacy they were going to be using or working in"* (P13). It was clear from the interviews that those professions that participants felt were most relevant were doctors and nurses, with all participants believing they should be involved in IPE sessions with pharmacists; *"I think medics and nurses would probably be most beneficial, because they are who you sort of interact with most"* (P9), *"I would always find those are the two core professions that we are working with"* (P4), *"I definitely think it would be a good idea for nurses to be there, as well as doctors"* (P6). It was also felt by P6 that IPE with doctors would be of benefit no matter what sector pharmacists worked in (primary or secondary care); *"I know not everyone goes into hospital but they are still going to talk to the GP at the end of the day aren't they, that would benefit (to do IPE with them)"* (P6).

Other participants disputed this and believed that although nurses and doctors should be included, IPE should be extended to incorporate all HCPs to aid understanding of roles and responsibilities; *"each and every one of them, what exactly their role is and what benefit they could have to the rest of us"* (P6) *"as for one particular person to be with I couldn't say, because they have all got their own value... they need to understand each other's roles"* (P8), *"I think we would be short sighted if we just did it with doctors"* (P9). However, some questioned this and felt that there should be a dialogue to see if other HCPs would want to be involved in IPE with pharmacists; *"I think it would be their opinion to say whether they think they should be there"* (P6).

**Table 6.14.** Participants' suggestions for the design and implementation of IPE

Participant	HCP(s)	Topic
P1	Drs and nurses	Understanding roles and responsibilities of HCPs and their training, case presentations
P2	Drs and nurses	Clinical, logistical and practical issues – knowing HCTMs to contact, following procedures, clinical governance, communication
P3	Drs and nurses	Anticoagulation in surgery, CDs with nurses, antibiotics with Drs, new charts
P4	Drs and nurses	Understanding roles and responsibilities of HCPs conditions and medications, relative to practice, patient centred
P5	All HCPs	Understanding roles and responsibilities of HCPs, building relationships
P6	All HCPs (especially Drs and nurses)	<u>All HCPs:</u> Understanding roles and responsibilities of HCPs and their views of pharmacists, case-based scenarios where HCPs work together and teach one another <u>Drs and nurses:</u> Role play of ward-based scenarios seeing patients - patients on admission and discharge ( <i>not emergency scenario</i> )
P7	Drs, nurses, SALT, OT, SW	Discharge in elderly/stroke patients, have real HCPs in OSCEs
P8	All HCPs	Understanding roles and responsibilities of HCPs
P9	Drs, nurses, ( <i>midwives</i> )	Learning different patient approaches from one another, observe HCPs in practice, communication skills
P10	Drs, nurses, dentists	<u>All HCPs:</u> Soft/transferable skills, communication, patient care skills, approaching a patient, prioritisation, bedside manner, holistic care <u>Drs:</u> Drug delivery and physiology
P11	Drs and nurses	Understanding roles and responsibilities of HCPs, communication, level of medication knowledge
P12	Drs, nurses, dieticians, OTs, physiotherapists	Understanding roles and responsibilities of HCPs, safe discharge of complex patient
P13	All HCPs Drs, nurses, SW	Patient perspective, project where all HCPs contribute
P14	Drs and nurses	Minor ailments
P15	Drs and nurses ( <i>dieticians</i> )	Virtual patient management where all HCPs can contribute

OT = Occupational therapist, SALT = Speech and language therapist, SW = Social worker

The belief that sessions need to be relevant to practice was also important to participants when considering the topic of potential IPE sessions, and participants suggested that practising professionals should be consulted when designing and implementing IPE so that it is contemporary to current practice and not just a 'tick box' exercise; *"what (IPE) we did was not realistic to what actually happens, so I didn't find either of them beneficial"* (P6), *"it needs to be rather than a tick in this box ... more tailored constructive feedback to your students which would require perhaps someone who works in the field to know what they are looking for and how representative that is of real life, so whether they are actually there doing it or whether they are there critiquing the whole set up of it"* (P2). One participant (P6) also recognised that developing a session which is relevant and meaningful for all professions is difficult to achieve; *"it is a hard situation to set up, it's really hard"*. The topic most frequently

referred to was understanding roles and responsibilities of HCPs (n=7), other suggestions included learning 'soft skills' such as communication and patient bedside manner. Doing this through the incorporation of patient-focused case studies was also frequently recommended; *"more of a workshop, that had case studies"* (P6), *"more of a virtual patient, patient management kind of topic, where everyone can contribute"* (P15). Whatever the topic P1 stated the importance of identifying and informing students of the learning outcomes of the IPE sessions before conducting them so that they are aware of what the sessions are aiming to achieve.

There were mixed opinions voiced by participants as to the best time to implement IPE. A number of participants suggested incorporating IPE as early and frequently as possible, with the belief that professional stereotyping starts while undertaking undergraduate study and can create barriers between HCPs; *"in university we are a bit separated aren't we in our different areas, so when you start working yeah obviously you work together as a team but there is that initial barrier"* (P10), *"being able to work as a multidisciplinary team is going to [be] of benefit to patients so if you can ingrain that into people from the very beginning I think it would stop people thinking that they need to work in isolation...I think it (IPE) is something that needs to be frequent, rather than just like a one off session"* (P13), *"I think if we learnt from a young age together and appreciated each other skills and what we bring to the table ... I think it could be really beneficial"* (P10).

However, others (n=4) felt that IPE should only be undertaken at postgraduate level once there is a greater awareness of one's own roles and responsibilities; *"I don't think the students are going to benefit each other that much, all of them I would assume haven't had that much experience within a hospital or within an environment which they, they won't know the problems and the barriers they are going to face yet"* (P2), *"I think you would have to teach that in practice"* (P5), *"I think it might be more beneficial in postgrad after you have started doing the job like I know medics have a lot of placements and stuff but as pharmacists you don't so you don't really have an accurate idea of what the job is and it might differ from community to hospital in terms of what you know and expect from the other person"* (P11).

One participant (P9) also suggested that the time IPE is conducted may be dependent on the profession; *"I guess as you go further on towards the end of the medical degree and pharmacy degree there are probably more complex things then that you wouldn't necessarily want a student nurse to be in on"*. However, this participant also felt that incorporating topics such as communication in early years could be relevant across professions; *"the things that you*

*would cover at a foundation level, the first two years, there's a lot of stuff really that they could actually do together, basic things on you know learning how to communicate with a patient, consultation skills" (P9). It was also felt that participating in IPE before starting new rotations would be beneficial to build up confidence in the specialism and build relationships.*

Participants also recognised a number of additional challenges to undertaking IPE such as logistical challenge in organising sessions and getting large numbers of different professional groups together at the same time; *"logistics is the biggest things really, how we get everyone together at the right time" (P10), "lots of groups of different people, it would be quite hard to organise" (P12).*

The setting of IPE was mentioned occasionally, with participants some participants reflecting on their own experiences to make recommendations about the need for environments which facilitates engagement such as workshop rooms and on the ward; *"if they were set out in groups on tables and there were cases to work through which you could help" (P6).*

### 6.3.2.3. Inductive data analysis

This section describes the results of the inductive thematic analysis that was used to identify themes within the interviews. Four main themes and associated subthemes were deduced and are outlined in **Table 6.15**.

**Table 6.15.** Hospital interview themes/subthemes generated through inductive thematic analysis

Theme	Subtheme
1. Perceived benefits of interprofessional interactions	1.1. Improving patient safety and care 1.2. Improving information exchange 1.3. Utilising the professional skills of each HCP 1.4. Professional development of HCPs 1.5. Building personal interprofessional relationships
2. Perceived barriers to interprofessional interactions	2.1. Lack of time leading to busy/stressed HCPs 2.2. Difficulty in accessing HCPs 2.3. Lack of understanding or poor perception of professional roles 2.4. When new in an interprofessional team 2.5. Pharmacist role creating barriers
3. Perceived facilitators to interprofessional interactions	3.1. Building good relationships with HCPs over time 3.2. Pharmacists and HCPs having good interpersonal skills 3.3. Pharmacists and HCPs being easily accessible (co-location) 3.4. Mutual understanding and appreciation of professional roles and responsibilities 3.5. Taking part in interprofessional ward rounds and team meetings 3.6. Development and incorporation of education methods including interprofessional education
4. Impact of doctors' seniority on interactions	4.1. Additional challenges when interacting with senior doctors compared to junior doctors 4.2. Value of interacting with senior doctors 4.3. Impact of pharmacists' seniority on interactions with senior doctors 4.4. Impact of doctors' seniority on interactions with pharmacists

#### 6.3.2.3.1. Perceived benefits of interprofessional interactions (IPIs)

The perceived benefits of IPIs were separated into five subthemes:

- 1.1. Improving patient safety and care
- 1.2. Improving information exchange
- 1.3. Utilising the professional skills of each HCP
- 1.4. Professional development of HCPs
- 1.5. Building personal interprofessional relationships

### 1.1. Improving patient safety and care

All participants recognised that working interprofessionally could improve patient care in some way with many participants expressing how vital it is to have a patient-centred approach; *“it’s (about) the patient at the end of the day, that’s the main focus, and by all of us working together hopefully we give them the best care”* (P8), *“the best way... to provide the best for our patients is joined up working, there is nothing worse than, you know, if you see things like duplication of care, poor communication, breakdown in communication all those kind of things that ultimately lead to patient suffering and distress”* (P10). Participants also felt that interprofessional working improved the efficiency of the care provided for example in making discharges *“smoother”* (P7) and *“more streamlined”* (P4). One participant, P5, also stated that by working interprofessionally they witnessed objective measureable improvements in patients’ conditions (through blood marker measurements); *“in terms of markers for CKD-MBD (chronic kidney disease- mineral bone density) once we started doing joint pharmacist-dietician regular interventions we moved to the top of that league table across the UK”*. In addition, by providing truly interprofessional services this *“also means that budgets are amalgamated and so as services develop and change and technology replaces certain things there is more ability to adapt to modern ways of delivering healthcare”* (P5).

### 1.2. Improving information exchange

Over half of the participants (n=8) acknowledged the positive impact IPIs have on the exchange of patient related information between HCPs; *“I need to be able to speak to the doctors or the nurses to communicate to them what the issue is and how to resolve this”* (P1), *“we have got our expertise as medicines experts but obviously then you have got the other healthcare professionals that look at it from a different aspect and I guess by having those discussions you get a much more well-rounded picture of things and in order to then provide the best care for the patients”* (P9). These interactions are also helpful in improving the efficiency of information exchange as HCPs can provide information to pharmacists which they may not be aware of (and vice versa) and can enable other HCPs to reinforce messages to either the patient or other HCPs when the pharmacist is absent; *“they (patients) may tell different people different things, so you do need that communication”* (P1), *“because they (nurses) have more interaction... they can reiterate those messages and follow through the treatment plans”* (P5). It was also suggested that IPIs helped provide a more consolidated care system which enabled all HCPs to interact more effectively and thus communicate the same message to patients, reducing possible confusion and duplication of care for both patients and HCPs; *“there isn’t the treatment management plan that I have come up with that*

*the dietician is contradicting or the nurse or the doctor is contradicting so there is a consistent message” (P5).*

### 1.3. Utilising the professional skills of each HCP

One key benefit to IPIs which was stated by eleven participants was that interactions enabled the utilisation of other HCPs skills and knowledge making it easier to resolve complex patient issues; *“each of the different disciplines will have specialist areas of expertise for that patient, I think it is very erm important to be able to recognise where your competence boundaries lie... to recognise where you have approached a subject which is outside you areas of expertise but have an awareness of knowing who to refer to” (P2).* The different ways each HCP approached problems also made interactions beneficial; *“I think what the medics bring to the table is that they allow us to help see those grey areas, erm and just see things from a different perspective” (P9), “the dietician has a different angle of the way they approach it... they look outside of our little pharmacological box and consider other things” (P2).* By including and utilising the skills of other HCPs this can *“create a holistic approach” (P5)* to patient care and improve the efficiency in which patient receive expert care.

### 1.4. Professional development of HCPs

It was acknowledged that IPIs could help improve awareness of other HCPs roles and responsibilities as well as reinforcing the pharmacist’s own role; *“(an IPI) helps you to develop yourself and you know you have a prominent role in the multidisciplinary team” (P12).* In addition, P5 believed that *“your practice changes to make sure that your communication to them (HCPs) is robust, that you understand their pressures and trust them to do things”* and working interprofessionally *“has allowed people to push to the top of their professional game”.* P8 also felt IPIs could then help them prioritise and tailor their work appropriately. Additional specific topics participants learnt from other HCPs has been detailed within section 6.3.2.2.4.

### 1.5. Building personal interprofessional relationships

Participants recognised that by interacting with HCPs they built social relationships which could be beneficial both for themselves and also for conducting future professional interactions; *“because we work with them day to day here so they become your friends and colleagues” (P5), “in terms of benefits for me it’s just another relationship I have with another person, so its another friendship... so it’s quite a nice social aspect to it as well” (P7).*

### 6.3.2.3.2. Perceived barriers to interprofessional interactions

The barriers to IPIs were separated into five subthemes:

- 2.1. Lack of time leading to busy/stressed HCPs
- 2.2. Difficulty in accessing HCPs
- 2.3. Lack of understanding or poor perception of professional roles
- 2.4. When new to an interprofessional team
- 2.5. Pharmacist role creating barriers

#### 2.1. Lack of time leading to busy/stressed HCPs

The limited time and stressed, busy nature of both pharmacists and HCPs work in the hospital setting was raised as an issue by twelve participants. This was particularly evident when attempting to engage with both doctors and nurses; *“it’s not as easy talking to a doctor as they are short of time”* (P14), *“you can tell when they (nurses) are quite stressed and they are rushing around”* (P12). This resulted in a reluctance for some participants to interact with certain HCPs as they didn’t want to waste colleagues time, interrupt them or increase their stress; *“a lot of the time you feel like you don’t want to interrupt them (HCPs) you can see they are rushing around and busy”* (P11), *“you do try not to interact with them (doctors) as much as possible and keep bothering them, because they do have their ward round and I don’t want to disturb them”* (P14). In addition, P12 suggested there were things they didn’t want to *“bother a doctor with”* so *“just let the nurse know and they can sort it out”*.

#### 2.2. Difficulty in accessing HCPs

Another substantial barrier to interactions was the difficulty participants had in accessing certain HCPs. Eight participants found that this was mainly due to HCPs not being co-located on the wards and therefore interactions were not organic. This was particularly the case with dietitians, SALT, OTs and SWs; *“I don’t speak to them (dietitians) normally just because if I’m honest they are not normally on my wards”* (P1) *“the ward I am on now they haven’t got a specific occupational therapist there all the time, speech and language therapist they just get referred patients so they just come to see a patient”* (P12). This professional separation was increased when the pharmacist did not work within a specialism or ward that required the input of particular HCPs. This limited access also occurred when the pharmacist themselves were not based on the ward, something that P9 found challenging as it meant interactions were not face-to-face; *“other pharmacists are very face-to-face with the doctors at ward level... most of mine are over the telephone I would say or by email... I kind of have much more of a barrier really than other pharmacists do because if pharmacists are at ward*

*level they are working with those teams, they have kind of got instant access to the doctors, whereas with the service I provide from down here (in the dispensary) I have got to try and get hold of somebody... you can bleep them and sometimes it's over an hour and you can still get no reply" (P9).*

In addition, when HCPs were stretched and busy (also see theme 2.1) this made accessing them harder, with participants suggesting this could be due to the low numbers of HCPs (because of lack of funding); *"if they are really busy, if they have got a whole bay of patients it can be quite hard to get hold of them" (P4), "nowadays because they are in such high demand of nurses and when they are there they need to be on wards with patients rather than having a discussion with me" (P2), "similar (barrier) to the doctors I suppose, being busy, because they are very short staffed at the moment" (P3).*

When HCPs or the pharmacist were not directly on the wards participants recognised the difficulty they faced in accessing the 'right' HCP and which HCP was dealing with certain patients; *"the biggest barrier is when they (doctors) are not on the ward and trying to contact them, or you don't know who is actually looking after the patient" (P4), "doctors can be in theatre so trying to get hold of them when you need them is really difficult... you have got to find someone else then and just try to convince them that this is needed for this patient even though it is not their patient" (P1).* This was made more difficult when the pharmacist did not know how to contact certain HCPs; *"they don't carry a bleep and they don't carry a phone" (P2), "I wouldn't know how to contact them (dieticians)" (P6).*

The physical separation from HCPs based in primary care made interactions more challenging for many participants (n=7); *"GPs it is a lot more difficult to get hold of" (P7), "in community there are more barriers (to interactions)" (P14).* This was often because it was difficult to interact with them (predominately GPs) straight away and they would often have to ring back, *"I would say because it is difficult because you have to wait for a call back usually don't you, you can't just get straight through, so that has limited my interaction" (P6),* which was a challenge as pharmacists didn't tend to have direct access to a fixed phone number; *"if you are covering three wards you are all over the hospital you can't give them a number to ring you back on" (P7).* These IPIs were also said to be less satisfactory as they were exclusively via the phone rather than face-to-face. This was said to make interprofessional relationships more difficult to establish; *"they are a lot more formal, erm so that relationship hasn't really developed" (P13), "I think you haven't got that relationship with the GPs that we have got within the immediate team you work with... it's just that unfamiliarity with that*

doctor" (P8). An additional barrier P9 found when contacting primary care HCPs was the 'broker role' of the receptionists (also see chapter 5.3.2.3.6); *"the receptionists, haha, they are the usual barrier"*. P9 suggested that receptionists were often reluctant to allow access to the GPs therefore they would have to negotiate to gain access to the HCP; *"I've found is that you have to be assertive and you have to stress the importance of why you have to speak to the doctor because otherwise the attitude you kind of get is, erm, you know they are very busy and they are not going to be able to speak to you today"*. Furthermore, P7 found interactions were made increasingly challenging as those doctors within the GP practice were not always the patient's regular doctor *"a lot of the time I have rang GPs it has been a locum GP in and the regular GP isn't there so they can't answer the question and what have you"*.

### 2.3. Lack of understanding or poor perception of professional roles

It was clear throughout the interviews that HCPs' understanding of each other's professional roles and responsibilities was vital in order to engage in meaningful IPIs. A number of participants (n=6) recognised that various HCPs did not have an understanding or appreciation of the pharmacy role; *"I think the problem with pharmacy as well is people don't know what we do"* (P6). Furthermore, six participants stated that they felt other HCPs had poor perceptions of pharmacists' role in practice; *"the biggest barrier I had in the beginning was their (midwives) perception of pharmacy"* (P9), *"you can tell they (doctors) are not really fussed, you can tell when you go to approach them and they are like 'oh what do you want' kind of thing... because some people do see pharmacy as people who point out mistakes and things like that"* (P12), *"doctors thought of us as, I don't want to use the word cash cows.. more or less"* (P14). This also bred negative attitudes towards pharmacists making interactions more challenging; *"they (doctors) didn't particularly want to speak to you"* (P3). P2 suggested one reason why this may occur; *"you learn not to blag or bluff their way through things, that is a very good way of losing a doctor's respect"*. In addition, P12 suggested that when HCPs *"had a bad experience (with a different pharmacist), you would find it would carry over to you"*. P14 also felt that some doctors had a sense of entitlement over pharmacists; *"I don't want to say entitlement but for example when doctors are doing their ward rounds they feel like they must have like the drug chart"* (P14). These issues may be why participants suggested that some HCPs such as dieticians and nurses will interact with doctors rather than pharmacists; *"a lot of the time the nurses speak to the doctors about medication"* (P4), *"they (dieticians) tend to speak to the doctors really if there is an issue"* (P1).

It was also identified that a number of participants (n=7) had a limited understanding of the roles of other HCPs (including dieticians, physios SALT, OT, SW and community midwives) and were therefore unsure how they could work together to improve patient care; *“so many clinical systems within hospitals don’t talk to each other, so we are not even aware of what our colleagues are doing for patients”* (P5), *“I don’t know in depth what they (OTs) do”* (P11), *“I thought dieticians and pharmacy were completely, you know, separate disciplines”* (P2). P5 suggested that this could be because *“there isn’t a clear relationship or understanding of what one profession does or can do for another or why joint working is important”*.

#### 2.4. When new in an interprofessional team

Participants recognised that when either they themselves or another HCP was new to an interprofessional team this created challenges as they were not familiar with one another and hadn’t built a professional or personal relationship; *“if I am covering a ward that I haven’t covered before it is more difficult because obviously they (HCPs) don’t know you and you don’t know them so erm you don’t know how much you can ask them to do”* (P1), *“it can depend on the familiarity of who is on the wards at that time and if it is a ward that I am on quite a lot so that the doctors know me and then they are more likely to come up to me”* (P10), *“we have kind of got new doctors so there are some barriers... that relationship is not the team that we last had then where they understood what was to be done”* (P8). This can then cause barriers because *“if they don’t feel they trust you then they will ask someone above you or someone separate to you”* (P2).

The impact that new interprofessional environments had on IPIs was particularly evident in the three participants who had most recently started working as hospital pharmacists. These newly qualified pharmacists reflected that they had a lack of confidence in interacting with other HCPs when they first began their professional roles, however this did improve somewhat over time; *“I think sometimes we don’t see ourselves as high up as the doctors and that and we are badgering them... so that is difficult to begin with”* (P14), *“I’d only just qualified and you just thought of doubt yourself sometimes to begin with... I think it is just giving it that time and having good feedback that makes you realise you are doing well and that just gives me the confidence to say right I am going to bleep the doctor and get this sorted, speak to the nurse and not just keep putting things back”* (P4). This lack of confidence in conducting IPIs was reinforced by P11 who often wrote notes rather than interacting face-to-face with HCPs; *“just sort of rely on sort of writing in notes”*. This was a mechanism that P10 recognised they had initially used but had moved towards more face-to-face interactions as their confidence in interacting developed over time (also see theme 3.1); *“I*

*think it does come with experience and confidence, so if you would have asked me that question 10 years ago I would barely say boo to a ghost and I certainly wouldn't really approach a doctor, I probably even take the route of writing in notes".*

### 2.5. Pharmacist role creating barriers

Participants felt that the role of the pharmacist could negatively impact interprofessional engagement, for example P2 stated that the 'policing' role of the pharmacist created barriers to interprofessional working; *"often the time you are approaching a junior doctor is to say why haven't you done this, why have you done this like this, which I view as wrong, gradually over time that is a negative, all of those little negative interactions can add up and it can get to the point where I think especially or junior doctors they will start avoiding you, erm because you are seen as the policeman of the ward perhaps... everyone is working in their own silos to cover themselves... making things less efficient".* P5 also felt the pharmacy profession as a whole is not as interprofessionally integrated as other HCPs; *"I think we need to start recognising that we work in silos and you really need to professionally and geographically and clinically integrate into the frontline if you are going to make any difference... I think the barrier between pharmacy and the other healthcare professions is bigger than probably most others... pharmacy as a whole can learn an awful lot from the structure of nursing and medics in the fact that they are genuinely multidisciplinary".*

### **6.3.2.3.3. Perceived facilitators to interprofessional interactions**

The facilitators to IPIs were separated into six subthemes:

- 3.1. Building good relationships with HCPs over time
- 3.2. Pharmacists and HCPs having good interpersonal skills
- 3.3. Pharmacists and HCPs being easily accessible (co-location)
- 3.4. Mutual understanding and appreciation of professional roles and responsibilities
- 3.5. Taking part in interprofessional ward rounds and team meetings
- 3.6. Development and incorporation of education methods including interprofessional education

### 3.1. Building good relationships with HCPs over time

Having good professional and social relationships with HCPs was described by many participants as beneficial when engaging in IPIs as it helped make interactions less formal and resulted in the development of balanced bipartisan interactions; *“(we interact) within lunch hours, after working relationships you know, it is more than just formal relationships”* (P5), *“if you have got good interprofessional relationships with other people they tend to approach you more and you are more involved in the care of the patient”* (P12), *“I am quite happy to say I think I have made those really good connections and links with the teams so that they come and find me which is really rewarding way to practice really”* (P10), *“I suppose if someone is asking me for help I suppose I am more inclined to go and speak to them as well then”* (P6).

Relationships were noted to develop over time; *“obviously because I have been there for so long now I know the nurses really well, erm so it’s a lot easier in that sense”* (P1), *“the more time you spend working with people the greater the relationship develops so they will be more willing to come to you and it will be easier to ask for their assistance as well so just building that rapport really”* (P13). In addition, as P4 suggested, once the relationships are built interactions become more open; *“I have got to know them the last couple of weeks, especially the F1s they come up to me with queries so it’s sort of now that two-way rather than me just pestering the doctors with things”*. P2 also felt that building these relationships helps improve patient outcomes; *“the better your relationship is you build it up over time, the more favourable outcomes you have, for yourself and the patient”*. Participants also suggested approaches that could aid the development of relationships including regular time on the ward, having social ‘mixers’ and HCPs such as doctors having more regular times when they are on the ward and available to interact.

### 3.2. Pharmacists and HCPs having good interpersonal skills

Participants recognised the importance of good interpersonal skills both in themselves and in other HCPs. Being approachable was seen to improve the likelihood of a quality IPI; *“I try to be quite open and I don’t mind them asking me questions, even if they feel it is a bit of a silly question I really don’t mind, so they tend to approach me”* (P12), *“your practice changes to make sure that your communication to them (nurses) is robust, that you understand their pressures and trust them to do things when it is safe and convenient to do so”* (P5). One method pharmacists employed to do this was by introducing themselves and finding out the names of each HCP; *“I would always like to introduce myself to the team and let them know I am around and available”* (P10), *“if it is a new ward that I am always introducing myself to*

*everyone of them, find out their names as well... I just think it is easier to talk to someone when they know your name... I think it just puts them at ease with me as well then doesn't it, to think that I am friendly and easy to approach then life is easier" (P6), "I now go up to them and introduce myself to them, and now when I see them on wards I chat to them and say how are you, so its good because it makes it easier for you if you have problems, and it makes it easier for them as well if they have problems" (P14). A number of participants found that a range of professions were approachable and friendly which aided interactions; "the surgeons on my ward are great and the consultants are wonderful, even in terms of like actually speaking to me and don't mind me asking them questions" (P1), "she (ward sister) is more than happy for me to knock and just pop in and have a quick chat about things" (P2), "they (dieticians) all seem very friendly... there's no sort of intimidation with them" (P6).*

### 3.3. Pharmacists and HCPs being easily accessible (co-location)

The accessibility of HCPs was seen to be a key factor when undertaking IPIs, with many participants suggesting that most HCPs were accessible if needed; *"they (HCPs) are quite accessible if I need them" (P1), "if there is a need for any pharmacist input we are available and likewise if we need to get hold of a doctor or if there is any sort of concerns we know that there is always somebody that we can contact" (P13). Co-location on the ward was seen to be a key factor in having good accessibility to HCPs and was found to make IPIs with nurses and doctors (particularly junior doctors - see theme 4.2) easier due to their continuous presence on the ward; "as soon as you arrive on the ward you know that there is doctors there" (P15), "they (nurses) are the easiest to get a hold of, you know where they are, they are always on one ward" (P9), "they (doctors) are there on the ward all day" (P8). In addition, P1 indicated physiotherapists had a regular ward presence and P8 indicated that dieticians regularly work alongside them on their ward. Of note, this was not a consistent feature of all interviews. HCPs having good access to pharmacists through co-location on the wards was also seen to benefit IPIs; "we do have quite a good presence on the ward so there is usually one of us around so they don't have to go hunting for a pharmacy person to ask questions about because there is usually somebody there or easily accessible" (P13).*

P14 also expressed how co-location made IPIs much easier in comparison to the segregated community pharmacy environment; *"that is one of the reasons why I interact better in hospital, it's because they are close by, so the closer the healthcare professional is to you, when they are right in front of you it is much easier to interact than if they are far away, and that's what tends to happen in community, you may have a pharmacist that is opposite the GP but it doesn't mean they are interacting, I mean they may hardly talk to each other". Other*

participants expressed how interacting face-to-face aided the communication and helped get issues sorted more promptly; *“if it can wait I will wait and see if I can see them face to face generally... you cannot properly get the full picture when communicating with someone over the telephone, you pick up on a lot of clues, body language, visual signs, expressions, eye contact, the way they act, you know lots of subconscious things that you probably get when you talk to someone, that you can’t appreciate if you speak to them over the telephone”* (P2), *“it is just easier to speak to them face-to-face as they are more likely to sort out the issues there and then”* (P1).

It was not just on the wards where participants found co-location helpful for conducting IPIs, P5 and P2 both shared office space with doctors and nurses which facilitated engagement between professionals; *“I sit 5 yards away from a consultant nephrologist so geographically with where we are placed day to day there is just interaction... not only are we professionally integrated but we are geographically integrated as well”* (P5). Other ways pharmacists were accessible to other HCPs when they were not present on the ward was through a bleep number and when pharmacists were tasked with answering phone calls from HCPs when based within the dispensary, medicines information department or when on-call. In addition, knowing how to contact HCPs when they are not present was seen to be important by participants; *“cisco phone is the wireless mobile phone that some consultants or registrars will have, which means they are easily contactable on most phones”* (P3) *“sometimes they put their numbers in the notes”* (P12). However, as some participants found that they did not know how to contact certain HCPs (see theme 2.2) it was suggested that having a central list of all contact numbers could be helpful and was indeed helpful in those hospitals where this system operated.

#### 3.4. Mutual understanding and appreciation of professional roles and responsibilities

Understanding and appreciating the roles and responsibilities of other HCPs was seen to be an important aspect of being able to engage successfully with other professions; *“you do have to have an element of respect and appreciation of their (HCPs) roles to know where your priorities lie in terms of with theirs... having an awareness of their duties will dictate when is good time and what is the best way to approach them to interact with them”* (P2). It was also acknowledged that HCPs were more inclined to interact when they appreciated the role of the pharmacist; *“they tend to come up to you as much as you go up to them because they understand your role as a pharmacist”* (P3), *“we work so closely with them (nurses) these days they fully appreciate the role of pharmacy, you know we never have any issues with nurses not*

wanting to cooperate with us" (P9), "they (GPs) welcome pharmacy and what they bring to the table" (P15).

It was also felt that the respect HCPs had for pharmacists had grown over time. One of the reasons for this was seen to be the advancement of pharmacy practice which has enabled pharmacists to become more embedded in the interprofessional team; "*I have been a pharmacist 14 years now and I see things very different now to what they used to be, so now it is great, you know pharmacists are very much seen as part of the multidisciplinary team and you know our thoughts and opinions are valued and people will actually come to us now and say what do you think about this*" (P9), "*I think our profile is a lot lot higher now and people recognise far more than they did years ago the benefits of the pharmacists on the wards and in the hospital*" (P10). One reason P5 believed their professional role had grown is through the backing of doctors within their hospital; "*our medics have realised that pharmacists are capable... they have seen the limitations that pharmacy have that they don't, they have worked to champion those professional boundaries so that we can become autonomous practitioners*".

Two participants, P2 and P13, found that the respect and appreciation for pharmacists stemmed from the respect which had been earned by their senior pharmacist(s); "*it probably stems from my boss's relationship with the consultants, who is very highly respected which has stemmed down through his team, that has had an immense benefit for me personally because you have instantly got an amount of respect from the doctors because you are a pharmacist in the renal team*" (P2), "*I think our lead nephrology and transplant pharmacist is really well respected which kind of helps the rest of the team as well*" (P13). P2 also felt that in providing high quality pharmacy services this positively influenced the frequency of interprofessional engagement that took place; "*that whole respect for pharmacy that I think, that is why they stop and listen and that they value what you have got to say, the more you do for them and the more right choice you make the more they respect you the more they use you so they will get in touch with you*". The specific specialisms and extended role(s) of the pharmacist (such as delivering presentations and teaching, conducting audits and doing research) was also seen to have a positive impact on interactions.

### 3.5. Taking part in interprofessional ward rounds and team meetings

A significant number of participants found that having a set time and environment where pharmacists and HCPs were together actively encouraged IPIs and helped develop interprofessional relationships. One example of this described by a number of participants (n=6) was attending MDT meetings; "*there may be a transplant patient review MDT, where*

*we discuss the clinics that have happened that week, so those are the day-to-day interactions so co-managing patients” (P5), “we have a weekly virology meeting where there is nurses, doctors and pharmacists that attend” (P13). Attending ward rounds was found to be a beneficial way of engaging in IPIs by a number of participants (n=8) and helped HCPs provide more efficient holistic care to patients; “I go on the consultant ward rounds twice a week, so I always consult with them (consultants) then so I am there at the point of prescribing... that improves your interaction and makes it much better because you are there, you don’t have to be hunting them down, you can understand why somebody had done something” (P8), “there is no formal referral systems that delay referral or interventions or treatments because the decision making including the diagnosis, supply of medications, the education, the follow up all happens at the patient’s bedside... you can create a holistic approach” (P5).*

A number of participants (n=7) intimated that attending (more) ward rounds with a larger range of HCPs would be beneficial; *“having more frequent MDT meetings... I think that would be really helpful” (P3), “the ward rounds are a fantastic opportunity to meet people... I think it is really valuable so probably more so of that and more of us all being able to attend” (P10), “we don’t really get involved in consultant meetings... I know there are opportunities, pharmacy could input in those” (P15), “I think having a nurse a pharmacist and the team of doctors on the ward round would probably help, especially in terms of communicating discharges” (P7).*

Three participants also mentioned that ‘board rounds’ with other HCPs could facilitate interactions; *“board rounds they have in the mornings on the ward, so kind of a huddle of different healthcare professionals, highlighting who is going to go home, who’s particularly high risk, who has got a social issues, who has got a dietician issue, you know that kind of thing, who has got a pharmacy issue, again joined up working” (P10). It was also felt that getting more HCPs involved in these would be beneficial; “if you had a sort of board round where you would involve all of those people and social workers, occ health and things, I think that would improve discharges because you could all communicate together so everyone knows what is going on” (P8).*

### 3.6. Development and incorporation of education methods including interprofessional education

As discussed in section 6.3.2.2.6, many participants articulated a variety of benefits when undertaking IPE such as understanding other HCPs roles and responsibilities. However, a

number of participants commented that these sessions currently occur infrequently and therefore suggested earlier and more regular IPE was needed in undergraduate programmes. Participants felt these sessions were required due to the clear professional separation in healthcare education (especially pharmacy) i.e. programmes are developed and delivered in a uniprofessional manner making it challenging to establish and develop interprofessional relationships; *"I'm not sure there is a mechanism in pharmacy that allows you to establish these relationships"* (P5), *"in university we are a bit separated aren't we in our different areas, so when you start working yeah obviously you work together as a team but there is that initial barrier"* (P10).

Although all participants acknowledged the benefits of incorporating IPE as a regular feature of education and training, it was also felt that additional changes are needed to improve IPEs taking place in practice; *"I don't think there is any one amazing cure, one great thing that will solve it all, I think it's one of those things that needs a really multifaceted approach"* (P10). One suggestion which was articulated by a number of participants was the incorporation of more practice-based placements for pharmacy students, with many feeling there is a disparity with other healthcare courses (especially medicine) where students have significantly more workplace experience before reaching practice; *"we don't do much work experience and things so the doctors don't see you when they are training"* (P1), *"the biggest thing with our undergraduate course at the moment without doubt is the lack of practical experience... we have to mimic the medical model as much as we can... we are missing a trick in that when these medical undergraduates are out at ward level with the teams we need to have our pharmacy undergraduates there at the same time doing that so really from an early, early stage they need to be part of that multidisciplinary team, patient facing, actually being able to apply the knowledge that they are learning in university"* (P9). P9 did acknowledge that this would be challenging to achieve due to the increased funding medical programmes ("unfairly") receive compared to pharmacy programmes, therefore they felt that pharmacy educators need to develop new innovative methods to achieve the desired interprofessional outcomes for students; *"this is why we need to think outside of the box really ... forget what we have done before, we really need to start thinking in a different way... rather than a student being employed by a pharmacy department actually getting employed by a health board and so then they could be attached to a consultant ward team"*. One way that two participants indicated this may be achieved was through an integrated 5-year MPharm programme with co-terminus graduation and professional registration. Participants indicated this may allow for an expanded placements programme; the 5-year integrated programme is currently offered by a limited number of UK schools of pharmacy.

Other suggestions included undertaking more OSCEs with an interprofessional focus (iOSCEs), reflecting and getting feedback on previous interactions, expanding teaching outside of specific professions (i.e. pharmacists teaching medics and vice versa) and undertaking interprofessional research days. P10 believed that using a variety of methods in combination would be helpful in ensuring that barriers to IPIs are broken down as much as possible; *“getting that experience under their belt from a very early stage as well as hand in hand with the OSCEs and the other things that are happening within the university, so I think those are supremely helpful in ensuring those barriers are broken down”*.

#### **6.3.2.3.4. Impact of doctors’ seniority on interactions**

The impact that a doctor’s seniority had on IPIs was separated into four subthemes:

- 4.1. Additional challenges when interacting with senior doctors compared to junior doctors
- 4.2. Value of interacting with senior doctors
- 4.3. Impact of pharmacists’ seniority on interactions with senior doctors
- 4.4. Impact of doctors’ seniority on interactions with pharmacists

##### *4.1. Additional challenges when interacting with senior doctors compared to junior doctors*

P12 found that interacting with doctors was the most challenging of all HCPs; *“they are the most challenging healthcare professional to interact with because they are very intelligent people and they have got a wealth of knowledge in specific fields”*. Over half of the participants, indicated that senior doctors provided the greatest challenge in terms of IPIs as they can be dismissive towards pharmacists and less inclined to interact; *“it is much more difficult (interacting with senior doctors) because they are more sort of, they tend to try and rush you... or they don’t sort of take your suggestions or what you have to say on board, you know they don’t take what you say as the right thing to do”* (P12), *“the more senior doctors may think that they know better, erm and may dismiss your opinions”* (P2), *“as they get more experience they tend to move away having more of the interprofessional experiences as they feel it’s an experience they don’t need anymore”* (P14), *“so the higher grade the doctor is, potentially I feel there is more of a barrier... some consultants here are notoriously not keen on pharmacy questioning things, and they like to do what they know is best”* (P15).

Conversely junior doctors were found to be easier to interact with than their senior colleagues as they often had a greater appreciation for the role of the pharmacist, accepted advice more readily, were a similar age to some participants and had better personal

relationships; *"I think that the junior doctors are fine, I think they accept us and appreciate the information that we give"* (P15), *"they tend to be the same age of me... you do get on well with them and you don't mind approaching them and be like oh can you sort this out"* (P12). Furthermore, junior doctors were generally seen to be more accessible than senior doctors as they spent more time on the ward presence and were said to be more readily contactable; *"the junior doctors are usually based on the ward"* (P2), *"the junior doctors are there all the time and they are the ones I am interacting with a lot"* (P12), *"so you can't really get hold of them (senior doctors) that easily, whereas like an F1 you literally bleep them and they pick up straight away"* (P7), *"the junior doctors are their constantly and those are the ones who we interact with"* (P15). It was felt that interactions with senior doctors were, at times, limited to the occasions they visited the ward or were conducting ward rounds; *"most times the consultants are only there is during their particular ward round"* (P15). A number of participants commented how senior doctors had less time to interact and could become short with pharmacists (also see theme 2.1), with P2 commenting that this means they have to choose carefully their interactions with senior doctors; *"some consultants, I don't know if it's stress, but they can get a bit short with you... I have to pick my queries a bit more carefully, does it warrant going to the consultant and using a minute and a half of his time"*.

#### 4.2. Value of interacting with senior doctors

Although IPIs were generally found to be less frequent with senior doctors, there were occasions where participants found it was important to contact senior doctors rather than junior doctors, even if this meant contacting them over the phone; *"I do get a lot of interaction with the registrars as well because there are things that I feel that wouldn't be fair for me to ask the junior doctor, from past experience I know that the junior doctor wouldn't be happy answering... so it is quicker if I just contact the registrar, those things tend to be more via telephone, and the registrar will equally contact me a few times throughout the day"* (P2).

#### 4.3. Impact of pharmacists' seniority on interactions with senior doctors

It was recognisable throughout the interviews that the more junior the pharmacist, the more challenging they found IPIs with senior doctors, with many finding interactions intimidating; *"the more senior doctors it is intimidating to begin with"* (P4), *"the higher up they are, I think it is intimidating yeah, because consultants I would (be) less inclined to approach them than if it was an F1"* (P6). Participants also commented how senior doctors could be less receptive to junior pharmacists; *"I think perhaps sometimes erm the more senior registrars erm are a bit choosy on their receptiveness to sort of advice from pharmacists erm particularly those of a lower grade"* (P13), *"I think because they are way*

*more experience and they may see you as a new young person and think you can't tell me (what to do)" (P14). This was in contrast to more experienced pharmacist participants who stated they interacted with "consultants down to the F1s" (P8), with a number of senior pharmacists stating they had good relationships with senior doctors; "we do have a really good working relationship with the consultants" (P13), "I have got quite a close relationship with the consultants" (P15). The challenges junior pharmacists faced aligned with a number of the challenges described in theme 2.4, which outlined the barrier to interactions when HCPs/pharmacists are new to an interprofessional team.*

#### 4.4. Impact of doctors' seniority on interactions with pharmacists

Similar to theme 4.3, and with reference to theme 2.4, participants also found that junior doctors often lacked confidence in engaging in IPIs with P6 feeling that they often led interactions with the junior doctors having little input. It was also felt by P2 that junior doctors *"can be hit or miss... you can have exceptional juniors... (and) other juniors not so much... you do start to just generally start avoiding them and start asking other people... if you don't think you are going to get the result or appreciation of what you deserve". This then led them to interact with other more senior doctors to ensure they achieved the required outcome; "if you don't feel they are going to get the outcome you want then you will ask someone else" (P2).*

## 6.5. Discussion

The role of hospital based clinical pharmacists in the care of patients has significantly evolved. This has led to a rethinking within the NHS about how to take greater advantage of pharmacist's unique skillset as experts in medicines. Whilst there has been a significant focus on further integrating pharmacists into interprofessional hospital teams (Dobson et al., 2006; Kaboli et al., 2006; Department of Health, 2013a; Carter, 2016) as there is a paucity of literature exploring hospital pharmacists' interprofessional interactions it is challenging to understand the current state of pharmacists' interprofessional roles.. This study therefore aimed to identify and explore hospital pharmacists' interactions with HCPs in Wales using a mixed method approach.

The questionnaire, which was disseminated via gatekeepers to approximately 520 pharmacists across all 19 Welsh hospitals containing in-house pharmacy departments achieved an estimated response rate of 51.9%. The response was varied across the six NHS LHBs surveyed (standard deviation of 15.4%, range 24.3% - 68.8%); this may have been influenced by the gatekeeper role in dissemination. Analysis of returned questionnaires indicated that hospital pharmacists most frequently interact with doctors and nurses. Of note, pharmacists perceived that they interacted more frequently with professions that were similarly located within the hospital compared to other. Interactions with HCPs that were physically separated, for example HCPs based within primary care, were much less frequent. Following the questionnaire phase of the study, 15 semi-structured interviews were conducted with hospital pharmacists to further explore these interprofessional interactions.

Given that a number of recent UK government enquires within secondary care have cited a breakdown in interprofessional team work as a key reason for the delivery of poor patient care in hospitals (Francis, 2013; Andrews and Butler, 2014; Kirkup, 2015) it may not be surprising that all interview participants suggested that working in interprofessional teams could improve patient care. In a review of interprofessional working in hospitals O'Leary et al. (2012) found that teamworking across professions was of critical importance in the provision of safe and effective hospital care and concluded that hospitals with high teamwork ratings experienced higher patient satisfaction, lower hospital costs and higher staff retention. In this current study, participants indicated that engaging with other HCPs improved information exchange and lead to better utilisation of the specialist skills and approaches of each HCP resulting in more efficient holistic patient-centred care. Participants also indicated that through IPIs, HCPs could learn from one another, recognise

roles and responsibilities and build social relationships which made the work environment more pleasurable. A number of reviews, summary papers and books related to interprofessional interactions and collaboration have noted similar benefits to practitioners (Freeth et al., 2008; O'Leary et al., 2012; Thistlethwaite, 2012; Carpenter and Dickinson, 2014; Barr et al., 2017).

In some cases, participants suggested improvements in service metrics were directly attributable to interprofessional interactions. For example, one participant stated that the implementation of regular pharmacist-dietician collaborative interventions in patients with renal disease had led to significantly improved CKD-MBD (chronic kidney disease - mineral bone density) markers in patients and the service has subsequently been recognised as one of the top performing in the UK. This is an interesting finding as, despite anecdotal evidence, a recent Cochrane review by Reeves et al. (2017) concluded that there is little high quality evidence which definitively correlates IPIs with improvements in patient care and patient outcomes. In addition, although a number of studies have concluded that pharmacists working in collaboration with other HCPs could improve specific patient outcomes in a range of disease states including CVD (Tsuyuki et al., 2016), CVD in type-2 diabetes (Al Hamarneh et al., 2017), heart failure (Koshman et al., 2008), blood pressure (Santschi et al., 2014) and dyslipidemia (Charrois et al., 2012)(see chapter 2 for further details), they too provide a weak evidence base. In most cases these studies investigate the impact of the pharmacy service itself rather than an interprofessional approach.

In the seminal report conducted by Lord Carter into the operational productivity and performance of NHS acute hospitals, the two professional groups hospital pharmacists were said to need to engage with in order to enhance clinical outcomes related to medicines were doctors and nurses (Carter, 2016). In this current study nearly all questionnaire respondents indicated that they interact with these professionals on a weekly basis (doctors - 94.1% of respondents, nurses - 94.8% of respondents) and a significant majority of respondents indicated they did so on a daily basis (doctors - 77.4% of respondents, nurses - 87.0% of respondents). All 15 interviewees also indicated that they had daily interactions with doctors and nurses. The IPIs with doctors and nurses were predominantly described to be collaborative with everybody working together to achieve common goals.

The interviews highlighted that pharmacists' IPIs with hospital doctors and to some extent with nurses predominately concerned clinical issues related to the appropriateness of medicines and this was seen as an activity that spanned a patient's stay in hospital from

admission to discharge. In a systematic review of pharmacists' clinical interventions conducted by Kaboli et al. (2006) the pharmacists' role in reconciling medicines and aiding the discharge process was found to improve patient outcomes (such as reduced medication errors, improved medication adherence and shortened length of hospital stay). However, the authors did not reference the interprofessional manner (if there was one) in which these tasks were conducted. In addition, in a study by Eggink et al. (2010) patients benefited from interprofessional collaboration between doctors, nurses and pharmacists as evidenced by a significant reduction in prescription errors on discharge when compared to those patients discharged by doctors and nurses alone (14.6% of those in the control group had at least one prescription error compared to 6.1% in the pharmacist collaborative intervention group). However, a number of limitations to the study were acknowledged including: the fairly small sample of prescriptions reviewed (n=86), the fact that interventions were conducted by one specific pharmacist in one hospital, and the nature of the pharmacists' interprofessional engagement was not directly assessed.

In a recent study conducted by Axon et al. (2018), 27 junior doctors (FY1s) across three UK hospitals were interviewed about their interactions with hospital pharmacists. The authors found that junior doctors perceived pharmacist-doctor interactions to be frequent and varied in nature, results which were corroborated by pharmacists in both the questionnaire and interview phases of this current study. In addition, Axon found that junior doctors felt they approached hospital pharmacists as much as the pharmacists approached them. This finding was in contrast to the findings here where the majority of interview participants felt they approached doctors on a more frequent basis. Interestingly this was less evident with nurses where on the whole participants indicated that the initiation of an IPI was fairly balanced between nurses and pharmacists.

IPIs with nurses were often focused on the patient, providing information to pharmacists related to different aspects of the patient experience that impacted on their holistic care. Participants found they had in-depth discussions about the patients and their ongoing care, often turning to nurses to find out how the patient is coping and ascertaining other general information such as their weight and ability to take medications (both physically, i.e. patients' swallowing ability, and with regards to their compliance). IPIs also included practical discussions surrounding how to administer particular medications (infusion rates etc.) in addition to other areas such as stock and supply of medications. It was generally found that IPIs with nurses had a more patient oriented, less clinical focus than with doctors. Similar findings were described by Snelgrove and Hughes (2000) who interviewed 20

doctors and 39 nurses across three hospitals in South Wales to determine their perspectives on interprofessional relations. The authors found that doctors perceived themselves as the key HCP in the management of the treatment process and this resulted in IPIs that were clinical in nature. Conversely, nurses felt they 'knew' the patient as a person and therefore could provide input in the interprofessional team about the patient's social, emotional and daily needs.

In a phenomenological study conducted by Makowsky et al. (2009b) that explored interprofessional experiences within an intensive care team (perhaps limiting generalisability), collaboration between pharmacists, doctors and nurses appeared to help facilitate positive patient outcomes, better team decision making about drug therapy, improved continuity of care and improved patient safety. These outcomes were all highlighted as benefits to IPIs within the interviews conducted in this current study. Furthermore, interviewees who felt they were embedded within the interprofessional team believed they developed trusting interprofessional relationships, made positive contributions to patient care and (like their HCP colleagues) developed an increased awareness of one another's roles and had a greater recognition of the benefit of interprofessional team working; these benefits were similarly described by Makowsky et al. (2009b).

Through the questionnaire phase of the study, dieticians were ranked third with respect to pharmacists' frequency of IPIs, with the majority (n=14) of interviewees also stating they interacted with dieticians on a regular basis (four of which on a daily basis). IPIs with dieticians were said to be collaborative and primarily involved clinical discussions about total parenteral nutrition and management of patients' electrolytes through diet and medication. Interactions involving information transfer between individuals of the two professional groups also occurred related to stock and supply of dietary items at the pharmacy. Other professions identified in both the questionnaire and interviews that hospital pharmacists interacted with included physiotherapists where interactions often focused on provision of medicines advice, occupational therapists and social workers who were found to be useful sources of information when arranging patient discharges, speech and language therapists where interactions aided the determination of appropriate medications for patients who may have difficulties swallowing, and midwives which were seen to engage in IPIs that were similar to nurse. Interestingly, although interactions in this study were found to be less frequent with 'allied' HCPs compared to doctors and nurses, Braithwaite et al. (2013) found that allied HCPs were the most supportive of the concept of

interprofessional collaborative working, with doctors the least supportive. The differences in attitudes towards interprofessional working have been measured elsewhere with Reid et al. (2006) similarly reporting that doctors had less positive attitudes towards interprofessional working in comparison to nurses, and Chang et al. (2009) also finding doctors were the least positive towards interprofessional working compared to nurses and other HCPs.

One factor which was seen to impact interactions was the particular specialism(s) of the pharmacist. A number of interview participants suggested that specific specialisms meant that interactions with other HCPs were more likely or necessary. For example, when specialising in areas such as stroke or renal disease, interaction with dieticians was seen to be a real necessity in the role. This was evident for other professionals including physiotherapists, occupational therapists, speech and language therapists, social workers and midwives, which saw some participants having frequent interactions as a result of their own particular specialism. Although participants recognised that their specialisms did have some impact on their nature of their IPIs with doctors and nurses it did not particularly drive interactions due to both the generalist nature of their roles and the fact they are a consistent feature of the ward environment rather than present due to their specialism. Interestingly, this contradicted the views of junior doctors interviewed by Axon et al. (2018) who stated that when they worked in areas such as surgery this negatively impacted their perceived frequency of IPIs with hospital pharmacists, something which wasn't generally evident in this study, even in interviews with pharmacists who specialised such areas (i.e. surgery).

The diverse nature of hospital pharmacists' roles was evident in the reported range of specialisms (43 across 270 respondents) by questionnaire respondents. One area of pharmacists' activity that was undertaken by a sizeable proportion of questionnaire respondents (14.8%) was on the 'supply chain' side (either procurement or aseptics). Engagement in such activities is seen as a barrier to interprofessional interaction's and inappropriate use of pharmacists' expertise. For example, in the UK government paper by Carter (2016) a recommendation was made for pharmacists to move away from activities associated with medicines supply towards more interprofessionally integrated, clinically focused areas of practice. Whilst pharmacists did not directly highlight their roles in these more traditional areas as an issue, it was clear that pharmacists recognised a need to provide more collaborative clinically focused patient care.

When patients required the input of allied HCPs, interview participants recognised that in order to do this professionals from the relevant group often came directly to the ward, therefore allowing pharmacists the opportunity to interact with them directly. This coincided with data from the questionnaires which indicated that junior pharmacists (who had a greater ward presence than their senior pharmacist colleagues) reported that they interacted significantly more frequently with a range of HCPs who were similarly co-located on wards (as identified in interviews) including nurses, dieticians and speech and language therapists.

The positive impact of co-location on frequency of IPIs was clear from the questionnaires and interviews. Indeed, there was a twenty-fold increase in respondents' frequency of interaction with secondary care doctors and nurses compared to their primary care counterparts. Interview participants reinforced this, indicating that the consistent ward presence of doctors and nurses was beneficial to IPIs and when segregated from HCPs this made IPIs more challenging. Participants indicated that co-location afforded greater access to HCPs and facilitated face-to-face interactions which aided communication and improved the efficiency of problem resolution. This greater access enabled them to build both professional and social relationships over time which increased comfort and confidence. Indeed in a model for improving relationships between pharmacists and doctors developed by McDonough and Doucette (2001) the authors believed that having close proximity to one another, increased volume of interactions and could aid the development of collaborative relationships resulting in improvements in the delivery of patient care.

Where HCPs were not regularly based on the wards due to factors such as limited numbers, staffing patterns and professional rotation to other specialisms, the process of developing relationships with individuals was hindered. Interviewees felt it was essential to have good interprofessional communication skills and used techniques such as introducing themselves to quickly build rapport. This technique has been shown to be welcomed by junior doctors who believed that knowing the names of pharmacists helped them get to know the pharmacist better, establishes a rapport and helps them to accept recommendations more readily (Axon et al., 2018). Participants' recognition of the need to have strong communication skills, to be approachable and to take the time to undertake interactions were also factors recognised in the model for improving collaborative relationships between doctors and pharmacists developed by McDonough and Doucette (2001). In a Joint Commission Update that reviewed and summarised the need for teamworking and communication in the nursing profession, Nadzam (2009) expressed the

importance that interprofessional communication (including body language, attitude and tone) have in ensuring that patient safety is maintained. A number of recommendations were made for nurses which are also applicable to other HCPs including addressing each other by name, being professional (but not aggressive) and having good listening skills.

Another area addressed by Nadzam (2009) was the need for nurses (and HCPs in general) to look for and resolve system problems and not 'play the blame game'. This was touched upon within the interviews in this current study, with participants suggesting that the role of the pharmacist in raising and addressing issues, errors or omission made by other HCPs can lead to a negative image of pharmacy and result in HCPs at times avoiding interactions with pharmacists. This may be why Axon et al. (2018) found that some junior doctors felt that communication with pharmacists was frustrating, inconvenient and repetitive when resolving prescribing issues. These negative perceptions may explain why pharmacist interviewees here felt that approaching interactions in the right manner was vital in maintaining positive interprofessional relationships.

When IPIs were deemed successful, participants indicated this helped build credibility and trust from HCPs and ultimately improved the interprofessional team dynamic. This corresponds with findings of Xyrichis and Lowton (2008) who undertook a review of the literature (43 papers included) to identify facilitators and barriers to interprofessional teamworking in primary care and found that a "climate of mutual respect and trust was fundamental for effective teamwork to exist" (pg. 149). Participants also found that professional credibility and respect could be developed and carried over from HCPs' interactions with other pharmacists, leading a number of interviewees to express their gratitude towards their senior pharmacist who they felt had created an environment which drew the respect and appreciation of other HCPs. Conversely, some participants articulated that when HCPs had previously had poor encounters with other pharmacists this could be detrimental to their own IPIs, believing that HCPs projected the encounter onto the professional group rather than the individual and were subsequently less likely to approach or trust pharmacists. In interviews (n=18) with doctors and nurses exploring perceptions of interprofessional roles and relationships Pullon (2008) detailed similar findings, with interviewees expressing that the development of mutual interprofessional respect and trust was related to demonstration of professional competence.

In an ethnographic study of the interprofessional communication modes taking place in 'general internal medical wards' in two teaching hospitals in Canada, Conn et al. (2009)

observed that HCPs communicated both synchronously (interactions happening at the same time, i.e. face-to-face communication) and asynchronously (interactions happening at different times, i.e. written notes). In this current study, although co-location of professionals resulted in IPIs being predominately face-to-face, interestingly junior pharmacists were found to prefer asynchronous interactions (via leaving notes) in comparison to senior pharmacists. This was generally seen as a negative mode of communication by participants as synchronous communication was said to result in more efficient delivery of care, helped develop relationships and enabled greater levels of interprofessional collaboration (rather than just information transfer). Junior pharmacists primarily cited lack of confidence as the reason they avoided synchronous engagement and therefore they often resulted left notes rather than engaging in face-to-face interactions. Whilst Conn et al. (2009) also observed that verbal interactions often substituted written communication they stressed that utilising both forms of communication is essential in order to comprehensively convey messages and highlighted that where individuals have recall issues following verbal communication, errors leading to patient safety issues could occur.

Co-location of HCPs also extended beyond the ward, with a number of more senior pharmacists indicating they were co-located in offices alongside individuals from other professions such as senior doctors and nurses. This was as a result of their management or directorate related roles. For these senior pharmacists, the topics of interactions also varied and often involved 'higher-level' or strategic issues related to clinical governance and organisational management. This may help to explain why senior pharmacists were found to interact significantly more frequently with consultant doctors than junior pharmacists. Similarly, junior pharmacists were found to interact significantly more frequently with junior doctors than their senior colleagues, likely due to the co-location of the two junior HCPs on the wards together. This was reinforced by a number of interview participants who stated that junior doctors were primarily based on the ward allowing them to easily communicate, whereas the senior doctors were frequently physically separate from pharmacists leading to either communication by phone or email or by waiting until senior doctors come to the ward for patient consultations, ward rounds or when undertaking MDTs. Although participants found this far from ideal they recognised that senior doctors could still be contacted if necessary. For other HCPs, including dieticians, speech and language therapists, social workers and occupational therapists, contact was more challenging when not co-located as pharmacists were often unaware of how to contact them directly.

The time constraints experienced by consultants and other HCPs was one cited by some interview participants as one reason for their limited presence on the wards and they felt this limited the opportunities available to develop interprofessional team relations. A similar finding was identified in an ethnographic study of interprofessional relationships within acute care conducted by Allen (2002) who reported that doctors and nurses often experienced difficulties communicating as their roles required them to be located in different parts of a hospital throughout the day therefore limiting opportunities for face-to-face discussions. In addition, as the resources and funding within the NHS become increasingly constrained, HCPs may be further limited in the time they can spend undertaking certain lower priority tasks. This was described by Snelgrove and Hughes (2000) who found in their study of doctor and nurse interprofessional relations in South Wales that work pressures negatively impacted interprofessional engagement and their effectiveness in working in interprofessional teams.

Indeed Bogden et al. (1997), who conducted a RCT comparing the impact of patients' (n=96) high cholesterol when receiving either an interprofessional pharmacist-doctor intervention or standard uniprofessional doctor care, found that although the collaborative pharmacist-doctor care significantly reduced patients' cholesterol levels the time required by the pharmacist to deliver this service diverted their time from other priority tasks. This raised concerns over the sustainability of the service and led to the recommendation that further investment in HCP numbers was needed if this service were to continue. Greater investment in HCP staffing was raised in interviews in this study as it was believed this could improve access to HCPs which could in turn increase the frequency of IPIs. In addition, it was hoped that this would also reduce the stress on HCPs as it could help spread workload. Of note, Axon et al. (2018) found that junior doctors felt that having greater access to pharmacists would be helpful as pharmacists could be difficult to find, phone lines were often busy and pharmacy departments could be slow. They also felt that there was a lack of continuity of pharmacists on the wards which made conversations repetitive and time-consuming.

One curious finding was that over half of the interviewees in this study felt that interactions with senior doctors provided an additional challenge as they could be dismissive and less inclined to interact with pharmacists. They believed that junior doctors had a greater appreciation for the role of the pharmacist, accepted advice and were more open to the development of social relationships. Furthermore, participants felt senior doctors' time was more valuable and constrained which resulted in some participants being more selective

with their IPIs with senior doctors and ultimately engaging in less frequent interactions. Whilst it was not exclusively the case, junior pharmacists found IPIs with senior doctors the most challenging. Participants explained this was because they felt intimidated by senior doctors and believed that they were not receptive to their advice in comparison to more experienced pharmacists. Findings from the questionnaire element of the study reinforced this disparity with junior pharmacists seen to have significantly less frequent IPIs with consultant doctors than their senior pharmacist counterparts. In a study conducted by Paice et al. (2002b) which surveyed 1435 UK junior doctors to determine their feelings towards their consultant mentors they found that a small number of respondents believed their engagement was negative as the consultant gave unfair criticism, were disrespectful and/or were bullying. Indeed, Paice et al. (2002a) further summarised that poor attitudes of some consultants towards the junior doctors resulted in them feeling confused, distressed and angry.

Nugus et al. (2010) also recognised the impact that a doctor's 'power' had on IPIs. They showed through 63 interviews, 68 focus groups and 209 hours of observation across HCPs within acute and non-acute health services that doctors were the dominant profession who were seen to assume responsibility for patient management and coordinating roles within the healthcare team. Although the study took place in Australia and therefore will feature some organisational differences compared to the UK, it is probably generalisable given the similarities in healthcare delivery and education between the UK and Australia. Similar findings were also highlighted by Baker et al. (2011) who identified through a series of 25 interviews with a range of HCPs in Canada that doctors perceived themselves as the 'leaders' and 'decision makers' in healthcare while pharmacists and other HCPs saw themselves as 'team members' who tend to adopt a holistic approach to care. Interestingly, Baker also found doctors had dominance in the decision-making process making it challenging for other HCP to assert their expertise, particularly if the doctor disagreed with their advice. This provides a challenge for pharmacists who have generally been seen to display a lack of confidence, a fear of new responsibility, a need for approval and are often risk averse (Rosenthal et al., 2010a).

Through ethnographic observation Rice et al. (2010) found that interprofessional hierarchies had considerable negative effects on communication and collaboration between HCPs on a general internal medicine unit. The authors highlighted how doctors were often accustomed to having their 'orders' carried out without discussion or negotiation. Similar issues were found by Jones (2006) who interviewed a range of HCPs and highlighted that

doctors used their position of power to critique their colleagues and 'expose' perceived faults in practice. This issue was also recognised by the interview participants in this current study as senior doctors were often said to display dominance and power within the interprofessional team, making it challenging for junior pharmacists to interact as they often felt intimidated by consultants and lacked confidence in undertaking these IPIs. This variation in 'power' seemed to decrease as pharmacists progressed in their careers and their professional and clinical knowledge grew, with senior pharmacists expressing their comfort in interacting with all levels of seniority. As senior pharmacists had significantly more frequent interactions with senior doctors than their junior colleagues this could also have been due to the greater level of trust and respect developed between the HCPs over time. Another reason, although not directly stated by senior pharmacists, was that junior pharmacists found interactions with junior doctors easier as they felt they were at a similar career level (and often age) which allowed for social relationships to develop which in turn enhanced the likelihood of each HCP approaching one another.

Whilst there was some reluctance to interact with senior doctors by some participants, there were certain clinical issues that were said to require their input. This was often because junior doctors felt uncomfortable in resolving some tasks which they determined were outside of their competence. In an online questionnaire completed by 20 UK junior doctors, Jubraj et al. (2015) found that junior doctors felt uncomfortable in altering medications without consulting a senior doctor first.

In this current study, participants who were more junior stated they interacted with a more limited range of HCPs, perhaps due to their own limited experience or lack of understanding of professional roles and responsibilities. This was a common theme for all participants irrespective of experience when they were new to an interprofessional team. The initial interactions were more challenging as participants stated they did not know the individual HCPs or the team dynamic.

This lack of understanding of one another's professional roles was seen as perhaps the biggest barrier to IPIs. This is a common theme in the literature and has been cited by a number of authors in a range of domains showing that team members often do not acknowledge, do not understand, or do not respect each other's roles and knowledge contributions (Hughes and McCann, 2003; Long et al., 2003; Barrett et al., 2005; Larkin and Callaghan, 2005; Kvarnström, 2008; Baker et al., 2011). Indeed, it is not only pharmacists who lack an understanding of other HCPs roles and responsibilities, there appears to be a

general lack of understanding of the pharmacist role. For example Makowsky et al. (2013) identifies through a survey of 26 doctors that they had a limited understanding of pharmacists' roles. This was similarly highlighted as an issue during the interviews in this current study, with many participants believing that this lack of understanding could breed negative relationships with pharmacists.

A recent study conducted in Australia by Wilson et al. (2016) explored the perspectives of recently graduated doctors, nurses and pharmacists (total n=68) related to their interprofessional collaborative practice. They found that the quality of collaboration was influenced by the extent to which each team member knew about and valued the particular skills and expertise of the other HCPs and respected each person's unique contribution to the work of the team. This was especially evident for pharmacists who often felt undervalued due to the misconceptions surrounding their roles. Having a good understanding of roles was also been seen to be vital where there was potential for professional activities to overlap. This was seen to make HCPs feel defensive of their own position, something which was highlighted by an interviewee within this current study who believed that doctors felt threatened by the new advanced role of the pharmacist. This is not a new challenge, Jones (2006) for example interviewed a range of HCPs and identified that professions often work in silos in order to protect their professional boundaries.

One method a number of interview participants felt could help improve understanding of roles and responsibilities was IPE. A positive perception of IPE was often dependent on the participant's prior experience of IPE; this was more common for junior pharmacists. These participants stated a number of benefits of IPE that directly aligned with the literature including the belief that it can improve interprofessional communication (Greiner and Knebel, 2003), develop interprofessional relationships (Barr et al., 2017) and improve attitudes towards other HCPs (Barrett et al., 2005; Freeth et al., 2008; Barr et al., 2017). These participants also indicated that early and repeated IPE would be beneficial in reducing barriers between HCPs during professional education; a number of authors have concluded the same including (Carpenter, 1995; Tunstall-Pedoe et al., 2003; Lindqvist et al., 2005). This was not universally supported however, with some participants suggesting that IPE should be undertaken at postgraduate level once professionals have a greater awareness of their own professional identity.

One theme that was fairly universal among participants was the identity of the HCPs who should be involved in IPE sessions with most participants indicating that IPE should be with

doctors and nurses. These professions were preferred as they were seen to be most relevant to practice. This is seen as a key feature of successful IPE in the literature. Where IPE is irrelevant to practice some suggest that it does more harm than good as it may instill the belief that interprofessional engagement is not valuable (Barr et al., 2017; Steven et al., 2017). Whilst the topics of proposed IPE sessions varied, nearly half of the participants suggested that IPE should be focused on understanding HCPs' roles and responsibilities and a similar number suggested that IPE should incorporate the development of soft skills such as communication. This is supported by Suter et al. (2009) who found, through interviews with 60 HCPs in Canada, that understanding and appreciating professional roles and responsibilities and communicating effectively emerged as the two core competencies required for achieving patient-centred collaborative practice and therefore suggested that these topics should be central to any IPE activity. Furthermore, differences in the way HCPs communicate has been found to lead to professional frictions (Rodgers, 2007). For example, nurses are trained to be highly descriptive whereas doctors are trained to be succinct, and his results in a mismatch in the way they communicate with one another. Acknowledging these differences in early parts of training pathways has been suggested as one way to develop relationships and achieve more effective communication and collaboration (Dixon et al., 2006; Clark, 2014). This is something that could feasibly be achieved through the use of IPE.

Although participants felt that IPE was valuable to practice they also recognised challenges in conducting IPE including logistical issues surrounding timetabling and accommodating large numbers of varying HCP students simultaneously. These are issues that are well developed in the literature (Levett-Jones et al., 2012; Lapkin et al., 2013; Carpenter and Dickinson, 2014). It was also suggested that sessions should be conducted in environments which facilitate interprofessional engagement such as workshop rooms or on wards as opposed to lecture theatres where interactions are challenging to achieve as has been shown by a number of authors including Taylor et al. (2012), Parsell and Bligh (1998), Barr (2000), Wilhelmsson et al. (2009) and Hammar (2000). As much as participants recognised the value of IPE it was also felt that this alone was not going to solve the current issues with interprofessional collaboration and suggested that alternative educational methods such as practice-based experience, integration of the MPharm programme with the pre-registration year and interprofessional OSCEs could all be of value.

A number of interviewees spoke of the potential value of engaging in interprofessional (often consultant-led) ward rounds. They indicated that these could significantly improve

their IPIs with doctors and other HCPs also present and believed they helped provide more holistic care to patients and improve patient outcomes. In a systematic review of hospital pharmacists' clinical interventions conducted by Kaboli et al. (2006), the authors summarised that including pharmacists in multidisciplinary ward rounds could improve patient outcomes, with a number of the studies included in the review showing statistically improved outcomes such as decreased adverse drug events and length of hospital stay. However, the generalisability and robustness of the studies included in this review were generally low as methodologies varied, sample sizes were often small, studies frequently focused on one institution and the extent of the interprofessional collaboration was rarely detailed.

A more recent example of the benefits of involving pharmacists on ward rounds was identified by Miller et al. (2011b) who found that when pharmacists attended consultant-led ward rounds they had significantly more interventions accepted by doctors than those made by pharmacists undertaking a ward visit alone (mean of 1.73 accepted interventions per patient compared to 0.89 when pharmacists did not attend ward rounds,  $p < 0.001$ ). This meant that there were a higher number of prescription errors rectified and treatment was better optimised. Furthermore, Miller et al. (2011a) stated that by involving pharmacists in these ward rounds it made pharmacists more aware of the priority patients and issues and provided greater opportunities for pharmacists to discuss drug therapies with senior doctors in which interventions could be made. A number of pharmacists expressed throughout the interviews in this current study how the ward rounds they attended helped facilitate IPIs with a range of HCPs (particularly consultants and other doctors). However, such ward rounds were often undertaken by more senior pharmacists and junior pharmacists who might see the most benefit often excluded. This co-location of senior pharmacists alongside consultants on ward rounds perhaps provides further explanation as to why they have significantly more frequent interactions with consultants than their junior colleagues.

In a response to Miller et al. (2011b), Quantrill and Webbe (2011) discussed how including pharmacists in consultant led ward rounds could help not only the patients but also the education of junior doctors in areas such as prescribing. This finding is supported by interview participants who found that attending ward rounds and other MDT meetings provided an opportunity for learning. Interestingly, as senior pharmacists were more likely to attend ward rounds this resulted in disparity in educational opportunities, with the junior pharmacists who would arguably benefit most often excluded due to lack of

experience and expertise. This is unfortunate as interviewees expressed how IPIs with senior doctors generally provided the most educational benefits.

As IPIs between secondary care HCPs are thought to be essential in the provision safe, effective care of hospital inpatients (Francis, 2013) and direct co-location of HCPs was seen to have a positive impact on IPIs (Jenkins et al., 2016) it may be no surprise that hospital pharmacists' interactions with HCPs based within primary care were found to be significantly less frequent. It was also evident that when interactions did occur, for example with GPs or community nurses, this often concerned the transfer of information between sectors rather than collaboration on patient issues. In a publication by the Kings Fund entitled 'Avoiding hospital admissions- Lessons learnt from evidence' interactions across sectors were said to be vital in ensuring timely and accurate transfer of information and ultimately reducing hospital (re)admissions (Ham et al., 2010).

In a review of services which aimed to prevent medication errors on admission to hospitals, Karnon et al. (2009) found that medicines reconciliation conducted by hospital pharmacists in collaboration with GPs provided a cost-effective way of preventing errors. They also found that this role was mainly conducted by junior pharmacists, possibly highlighting why this population was found to interact significantly more frequently with community nurses and GP receptionists in the questionnaire element of the study. In common with community pharmacists' views (see chapter 5), GP receptionists were seen to play a 'broker' role (Burt, 2005) in interactions with primary care HCPs which, in some cases, impeded interactions. This is a finding that has been reported elsewhere (Swinglehurst et al., 2011; Bradley, 2012). These interactions with receptionists were generally unavoidable as IPIs with primary care HCPs were found to be exclusively the phone and therefore required pharmacists to contact the receptionist in the first instance in order to access the HCP. In addition, Eggink et al. (2010) found that hospital pharmacists' role in optimising medications on discharge and subsequently informing HCPs within the primary care sector resulted in more accurate implementation of care. These cross sector interactions are therefore strongly encouraged within the NHS (Bienkowska-Gibbs et al., 2015).

One area of pharmacy practice which has significantly expanded in recent years is the pharmacist role within GP practices, with Welsh Assembly Government (2015) believing pharmacists can provide valuable medicines related information, optimise medication regimens and ensure the safety of a patient's medication use. Nearly two-thirds of hospital pharmacists interacted with GP practice pharmacist at least once a month and although the

reasons for these interactions were not identified within the interviews they are likely to relate to the transfer of information across sectors much like the other IPIs that hospital pharmacists had with primary care HCPs.

Whilst the transfer of information on patient admission and discharge to/from hospital is a clear reason for hospital pharmacists' interactions with primary care HCPs, the process with which hospital pharmacists can access this information has very recently changed. Much like their colleagues in NHS England who have access to the Summary of Care Record (SCR) system (Pharmaceutical Services Negotiating Committee, 2018), NHS Wales (2018c) have introduced a similar system entitled the 'Welsh GP Record' which enables hospital pharmacists (as well as hospital doctors, nurses and pharmacy technicians), to access an electronic summary of a patient's key clinical information. The implementation of this system may therefore reduce direct interactions with primary care HCTMs (including GPs, nurses, pharmacists and GP receptionists) as pharmacists will have ready access to much of the information required for conducting tasks such as medicines reconciliations.

Although co-location was seen to be a key facilitator to IPIs, interestingly two of the 270 participants indicated they interacted more frequently with GPs than hospital doctors. Whilst the reasons for this are not fully clear, these participants shared common characteristics. They were both primarily office-based with a role in management, with one being the only band 9 respondent and the other a band 8 who also specialised in primary care.

Much like community pharmacists (see chapter 5), hospital pharmacists frequently interacted with D/Ts and ACT, highlighting the roles these individuals have in supporting pharmacists in the safe provision of medications (Royal Pharmaceutical Society, 2017c). Pre-registration pharmacists were also seen to be an integral part of the hospital pharmacy team, with questionnaire respondents from 18 of the 19 hospitals interacting with this pharmacy based HCTM.

### **6.4.1. Limitations**

Although a mixed method approach was utilised to reduce the limitations of undertaking a single methodological approach (Johnson and Onwuegbuzie, 2004) some limitations still remained. Whilst stage one (questionnaire) had a good estimated response rate of 51.9%, this was varied across health boards impacting on the generalisability of the data (Babbie, 2015c). This variation was likely due to the gatekeeper dissemination process, therefore

ensuring gatekeepers were provided with an increased number of prompts and reminders may have been of value in aiding the dissemination and collection of questionnaires within their hospitals.

Many of the limitations within this study overlapped with those within the community questionnaire and therefore have been briefly touched upon here (see chapter 5.4.1 – limitations for more details). These limitations include: the impact of recall bias on respondents self-reported (perceived) frequency of interactions; respondents understanding of the term ‘interaction’; respondents understanding of section A (demographic) questions (e.g. the definition of ‘current specialty’, which referred to all the specialty roles respondents were currently undertaking rather than the one they were doing on the day of the questionnaire); the use of visual comparisons within the chi-squared testing process; the impact of demand characteristics; and the fact that the study was solely centred around Wales.

Much like the community pharmacist study, a limitation of stage two of the study (semi-structured interviews) also related to participant recruitment. As ethical approval was not practicable in a timely manner from one LHB (Aneurin Bevan UHB) this limited the pool of potential participants. In addition, as the study progressed it became clear that recruiting participants from the Hywel Dda UHB was not possible due to a number of factors including distance, time and response to participation requests. Furthermore, no participants were recruited from Velindre specialist cancer hospital. Therefore, although the study achieved a strong repetition of themes (Malterud et al., 2015) participants from other demographic areas may have helped identified new themes. Additionally, as results were based on personal experiences it is impossible to state that recruitment of more participants in general would not have impacted the data and themes generated (Morse et al., 2002; Bowen, 2008; Corbin and Strauss, 2008).

Although interviews were conducted for convenience in the participant’s workplace, unlike with interviews conducted with community pharmacists (see chapter 5) the participants were not the sole responsible pharmacist therefore were able to freely engage in interviews with minimal distractions. Additionally, on all occasions interviews were conducted in a private, quiet room to further avoid distractions. There was only one occasion during the interviews where an interview was interrupted due to the participant receiving a bleep (phone call), however this was coincidentally from another HCP (nurse) which enabled further development of this topic within the interview.

## 6.5. Conclusion

Following on from the community pharmacy study (see chapter 5), stage one (questionnaire) of this study identified the HCPs that hospital pharmacists interact with most frequently in practice, namely hospital-based doctors, nurses and dieticians. IPIs with primary care-based HCPs occurred significantly less frequently. Stage two (semi-structured interviews) determined the topics and mode of interactions with specific HCPs, highlighting that IPIs with secondary care HCPs primarily occurred face-to-face on wards and were often collaborative in nature. This differed significantly from IPIs with primary care HCPs which were primarily over the phone and generally involved the transfer of information. A number of benefits of IPIs were articulated by participants including improving information exchange, utilising professional skills, educating HCPs and building interprofessional relationships. These were all said to improve the delivery of patient care. Participants stated that IPIs increased through co-location alongside HCPs on the ward or on interprofessional ward rounds.

A number of barriers to IPIs were identified including time constraints experienced by HCPs, the negative interprofessional role of the pharmacist (i.e. pointing out errors made by other HCPs) and challenges in interacting with senior doctors (especially when a junior pharmacist). Similarly, a lack of understanding of professional roles and responsibilities and poor communication during interactions resulted in sub-optimal interactions. Addressing these issues through IPE sessions was suggested as one possible facilitator. The time that IPE should be introduced was disputed by participants, with some advocates for early and regular undergraduate IPE and others believing it should be conducted once pharmacists developed a greater understanding of their own roles and responsibilities (i.e. at postgraduate level). One area which was not disputed was the need for IPE with both doctors and nurses, with participants suggesting that other HCPs could be added as long as relevance to practice is maintained.

While the frequency and collaborative aspects of hospital pharmacists' IPIs varied it was clear that interprofessional relationships can and do develop even when absent of external or internal facilitators. Therefore, by actively supporting the development of interprofessional collaborative relationships through a variety of measures including the incorporation of meaningful and relevant IPE this can help make highly functional interprofessional working become the norm across healthcare practice.

## **Chapter 7 - Summary**

## **7.1. Personal reflections and implications for my professional pharmacy practice**

The results from this thesis have recognised that pharmacists believe interprofessional practice is a progressive field which can have benefits on professional practice and the delivery of patient care. As a researcher who was practicing within both the community and hospital pharmacy throughout the duration of this thesis I believe the insights I have gained from conducting these projects have also had a direct positive impact on my practice. I have therefore given a personal reflective account of my own interprofessional practice and how this has developed as a result of undertaking this project:

Upon completion of an MPharm degree at Cardiff University I found myself both nervous and excited to continue my progression towards a professional career that I felt could have a genuine positive impact on the care of a patient. To do this I still needed to navigate through my pre-registration year, a role I undertook within the University Hospital of South Manchester. This role represented my first real experience within a hospital as, much like many UK MPharm degrees, I had limited practical work experience provided during university and I was therefore excited but apprehensive for the prospects ahead. Strangely the apprehension was not only from meeting new colleagues and integrating into a new professional environment, it was also because I had no real idea about what my role was and how I fit within the interprofessional team. This was something which became instantly apparent when I found myself asking seemingly 'basic' questions such as: 'what is my professional role?'; 'how do I fit within the interprofessional team?'; 'why would I interact with each HCP?'; 'why would they interact with me?!'. This represented a steep learning curve. I initially found myself exploring my professional role and how this could aid the interprofessional care of patients. I then began to explore other HCPs' roles and responsibilities by approaching (often junior) staff for discussions, probing areas such as their specific skills and knowledge. Upon doing this I was surprised to find that they too had questions around the role of the pharmacist, something which was initially difficult to answer without generically stating 'well we are the experts in medicines'.

Through actively pursuing interactions with other HCPs and observing the interprofessional interactions pharmacist mentors undertook this started to pique my interest in the area, not least because the responses and interactions were so varied. Some HCPs had clear close interprofessional relationships and would actively and frequently interact with one another, whereas others would work very independently. I questioned

why this was the case and wondered if it could be altered. This drew me back to my single experience of IPE within university and my MPharm project in this area. Could this be a solution? Would more of this have helped better prepare me for starting my pre-reg and future professional practice? Once I completed my pre-reg I decided to embark on answering some of these questions by undertaking this PhD.

The aim of this thesis was therefore to explore pharmacists' interprofessional interactions in order to help inform the meaningful design of IPE for pharmacists and pharmacy students. A mixed method approach was conducted to explore the IPIs of pharmacists in the two current predominant sectors of UK pharmacy practice namely community and hospital (see chapter 5 and 6 respectively). Stage one of each study featured a questionnaire to identify the frequency of pharmacists' interactions with a range of HCTMs in Wales (response rate: community pharmacies 443/716 (61.9%); hospital pharmacists 270/approx. 520 (51.9%)). This was subsequently followed by semi-structured interviews with pharmacists from the two healthcare sectors. Participants were recruited until the samples represented a sufficient cross section of pharmacists in each sector, constant comparison indicated strong repetition of data and themes, and the study aims had been achieved (participation from: 14 community pharmacists; 15 hospital pharmacists)(Bowen, 2008; King and Horrocks, 2010a; Malterud et al., 2015). Interestingly, as my research progressed so too did my professional career, with my PhD findings having a direct, positive impact on my interprofessional practice (which spanned across both community and hospital pharmacy) in a number of ways.

Throughout the interviews pharmacists from both sectors of practice expressed the belief that interprofessional working led to the provision of safer and more effective patient-oriented care. Those interviewed indicated that this was achieved through a number of mechanisms including (i) improvements in the exchange of knowledge and information; (ii) better utilisation of the specific skillset of each HCP; (iii) increased understanding of professional roles and responsibilities within the healthcare team; (iv) increased understanding of the patient and their condition through an interprofessional approach; (v) informal learning from one another and (vi) building professional and social relationships which enable HCPs to more readily approach and trust one another which in turn makes the work environment more pleasurable. In some cases, participants indicated that direct improvements in patient care through strategic interprofessional teamwork had been evidenced through patient metrics. For example, one hospital pharmacist stated that the implementation of regular pharmacist-dietician collaborative interventions resulted in

such significant improvement of patient disease markers and that as a consequence the service was recognised as one of the top performing services for this specialism in the UK, a finding which is rarely directly attributed to interprofessional collaboration (see chapter 2). These findings strengthened my belief that interprofessional practice can improve patient care, whether that is directly through improved outcomes or indirectly through HCPs sharing knowledge and referring patients to the most appropriate profession.

One finding that I have purposefully integrated into my practice is the benefit of making acquaintance with HCPs as early as possible and actively using first names as this helps build rapport. This initial interaction subsequently creates a platform for developing interprofessional relationships overtime. Developing social relationships through more frequent engagement was also found to be vital as this also opened more natural opportunities for professional interactions, as both HCPs were found to be happy to approach one another. I therefore now aim to develop social relationships as quickly as possible, often using my first introduction to HCPs to be more general and social rather than grilling them with a number of professional queries. This was found to be particularly important for pharmacists as study participants found that their interactions with other HCPs were perceived to be negative as they point out errors in others, therefore approaching this in a positive way is vital in order to ensure interactions are productive and not defensive. Participants also felt that individuals with friendly and personable communication skills were more approachable, facilitating positive interprofessional relationships that ultimately increases the frequency of interactions. The findings of this study also helped me better reflect on my own interpersonal skills to ensure they were open and engaging in order to make HCPs feel they can readily engage in IPIs.

Within the interviews it was interesting to see that a number of community pharmacists felt that GPs and some other HCPs had a negative perception of their role believing that their primary driver was to make money and that the role was more akin to being a shopkeeper rather than a health professional. Whilst this was not a unique finding (Van et al., 2011; Bradley, 2012) it highlighted that there was still progression required in order to create a cohesive interprofessional team. A broader lack of understanding about HCPs' roles and responsibilities was highlighted as a key challenge for successful IPIs by both community and hospital pharmacists. Participants perceived it to be a factor that led to the underutilisation of HCPs as quite simply if one lacks an understanding of the skillset of another HCP then they are unlikely to be called upon for their expertise. A number of hospital pharmacists also recognised how more senior doctors often had a reduced

appreciation for pharmacists, however found more junior doctors to be more willing and receptive to engagement. Whilst this may be due to a number of reasons, the recent incorporation of IPE into undergraduate HCP curriculum may have helped reduce barriers and improve the understanding of different HCPs (see section 7.2 for further discussion). However, as I had limited IPE within university (one session with medics) and had undertaken no IPE post-graduation I had to seek my own opportunities to engage. Initially this was a challenge as I had little confidence in approaching HCPs as I was unaware of the reasons why this may be of value. However, as stated across the interviews, my understanding of and relationships with other HCPs developed over time, having a positive impact on my delivery of interprofessional patient-centred care.

One finding which was also evident within my own personal practice was the disparity between interprofessional engagement when in community pharmacy compared to hospital. The co-location of HCPs was hugely beneficial to my interprofessional practice when working in hospitals compared to being physically separated in dedicated community pharmacy buildings. This was reflected in my research, with hospital pharmacists' engagement generally seen to be more regular than community pharmacists, evidenced by the frequency of interaction with a range of HCPs including doctors and nurses which were the two most frequently interacted with HCPs. In interviews, participants indicated that doctors and nurses were present almost continuously on wards which facilitated face-to-face interactions. The ability to interact in a face-to-face manner was seen as a facilitator to interprofessional interactions and conversely lack of accessibility was seen as a barrier, a finding demonstrated elsewhere in the literature (McDonough and Doucette, 2001; Brock and Doucette, 2004; Snyder et al., 2010). By co-locating HCPs within hospitals this also benefited the ways interactions were initiated with hospital pharmacists feeling that interactions were very much two-way, with each profession regularly approaching one another enabling greater utilisation of specialist skills and knowledge. The data within this study helped me recognise that by physically co-locating myself on the wards as much as possible this could increase the likelihood of interactions and enable more face-to-face interactions which subsequently increased the ease with which they took place compared to phone and written communication.

There were a number of suggestions within the research to aid relationship development through co-location, these included being based on the same wards/specialisms/community pharmacies regularly and engaging in interprofessional ward rounds/multidisciplinary meetings/GP practice meetings. As a locum pharmacist I

found these were missed opportunities for me personally as my irregular practice often saw me utilised in a variety of environments making it more challenging for me to maintain and build relationships and get involved in arranged interprofessional practice such as ward rounds. This resulted in frequent reintroduction to interprofessional teams, all of which take some time to integrate within.

In contrast to hospital pharmacists, community pharmacists' interactions with HCPs were primarily over the telephone. Whilst this mode enabled IPIs to take place, it is more difficult to build personal and professional rapport and this was seen to negatively impact IPIs. The benefits of being co-located within the community was evidence within this study with those community pharmacists who were located within GP practices reported significantly greater levels of interactions with HCPs similarly co-located in the practice. This represented the first study showing the positive impact on levels of interprofessional interactions when pharmacists are co-located with other HCPs (Jenkins et al., 2016). However interestingly, even when community pharmacists were based in GP practices interactions continued to be via the telephone perhaps due to the time pressures in the community pharmacy environment or perhaps because community pharmacists are more confident with this method. Furthermore, in contrast to hospital pharmacists, community pharmacists primarily identified themselves as the initiators of interactions and articulated that their IPIs were generally related to informing HCPs of issues rather undertaking two-way collaborative practice.

One of the key barriers to interacting with primary care HCPs which was perpetuated by the lack of co-location was the role of the GP practice receptionist. Receptionists were seen to act in a broker role (Burt, 2005) that often reduced and in some cases prevented pharmacists' direct engagement with a HCP (often the GP or community nurse); other studies have demonstrated a similar finding (Swinglehurst et al., 2011; Bradley, 2012). Compounding this issue were restrictions pharmacists felt were in place that prevented access to patient information. This can have negatively impact on continuity of care given that timely and accurate information transfer has been shown to be vital in preventing hospital (re)admissions (Ham et al., 2010). Receptionists were seen to be a significant hindrance in this information transfer at the time of the study as (outside of directly contacting the HCPs, often via the receptionist) there was no other method of accessing GP records within Wales, a factor NHS Wales (2018c) have recognised and aimed to rectify through the introduction of the 'Welsh GP Record' scheme which enables HCPs direct access to patient care summaries. However, this is currently restricted to secondary care HCPs

(including hospital pharmacists) and therefore community pharmacists don't yet have access. In order to combat this in my own practice I made a conscious effort to try to build a rapport with the receptionists, once again introducing myself and actively learning names. Unsurprisingly, and in line with community pharmacist interview data, once a professional understanding was built it was clear that the receptionist was an asset in aiding information transfer and solving certain non-clinical issues.

These small but significant changes have helped me to advance my interprofessional practice and allowed me to flourish as a well-respected and integral part of the interprofessional team in primary and secondary care.

### **7.1.1. Recommendations for pharmacy practice**

Whilst the research positively influenced my own personal practice and enabled me to implement a number of changes to my day-to-day interprofessional practice as discussed above, there is plenty of room for further improvement. Although there a number of methods I can personally implement to improve this practice (see section 7.1) interview participants also believed that there are a number of other facilitators can be implemented at a large scale organisational level to improve aid the uptake of interprofessional practice throughout and across a range of care sectors. A series of recommendations have therefore been identified from the research which if implemented on a national and international level may help drive policy to achieve better interprofessional collaboration across healthcare (Department of Health, 2010; World Health Organisation, 2010). The four recommendations below do not include advice surrounding the incorporation of IPE in undergraduate/postgraduate education as this has been discussed in depth in section 7.2:

1. Increase the frequency and ease with which interactions can be initiated through greater co-location of pharmacists alongside other HCPs (data supporting this in chapter 5 questionnaire and interviews (see 5.3.2.3.4) and chapter 6 interviews). This can be done in hospitals by encouraging pharmacists to be regularly based on the wards and to attend interprofessional ward rounds (see chapter 6.3.2.3.3) and done within primary care by creating more interprofessional health centres (see 5.3.2.3.4) or through driving the development of alternative methods of interaction between primary care HCPs and other sectors. Alternative methods could include greater utilisation of technological advances such the Welsh GP Record scheme (extend to community pharmacists as well as hospital pharmacists) and direct email

or telephone numbers could enable greater access to HCPs (see 5.3.2.3.3 and 6.3.2.3.3 for further details of these suggestions)

2. Encourage pharmacists to engage in more clinically/patient focused interprofessional practice by ensuring pharmacists have more time in order to undertake this practice (see chapter 5.3.2.3.2) . This can be done through the continued transition of pharmacists away from technical roles (i.e. dispensing, manufacture) and by better utilising other pharmacy team members. Providing higher levels of funding for staffing (see 6.3.2.3.2) could also increase time for interprofessional collaboration outside of the regular workload and relieve stress, a factor which was recognised to negatively impact IPIs
3. Provide formal opportunities for interprofessional interactions when pharmacists are new to interprofessional teams (see 6.3.2.3.3). This will help them to meet HCP collaborators, build relationships and embed within interprofessional teams smoothly. Whilst this could be encouraged through incentivised schemes (i.e. the Collaborative Working Scheme) it must be made clear that interprofessional collaboration is good practice and not just done for monetary purposes. Furthermore, if incentivised it should be ensured that explicit measures are implemented in order to monitor progress
4. Encourage greater promotion of the unique roles and responsibilities of the pharmacist in order to inform other HCPs about how pharmacists fit within the interprofessional team and how they can aid other HCPs in the provision of patient care (see 5.3.2.3.2, 6.3.2.3.2 and 6.3.2.3.3).

## **7.2. Implications for the design and delivery of interprofessional education**

As there was a paucity of literature surrounding the landscape of IPE in UK pharmacy a questionnaire was disseminated to academics involved in the design and delivery of IPE within each UK school of pharmacy to explore this area. Analysis of returned questionnaires (17/29 pharmacy schools participated) demonstrated a significant diversity in the breadth of IPE currently taking place, with variations seen in: (i) the number of sessions conducted by each school (ranging from 1 to 20); (ii) the MPharm year group undertaking sessions (relatively evenly spread across all four years); (iii) the range of student groups involved in each session (26 different student groups involved across the 88 sessions described); (iv) the number of student groups involved in each session (ranging from 1 to 11 student groups alongside pharmacy students in a single session); (v) the environment the sessions took place; (vi) the theme/topic of each session; (vii) the learning outcomes set; (viii) the method (if any) of assessing outcomes; (ix) the method (if any) of evaluation sessions. Whilst the

sessions were varied, there were some commonalities seen between sessions including: (i) sessions primarily being conducted with pharmacy students and just one other HCP student group (of which medical students were the most common); (ii) sessions generally being set in workshop rooms; (iii) sessions frequently being centred on the development of interprofessional teamworking and communication. Whilst IPE was embedded to a greater or lesser extent across schools, learning outcomes were rarely assessed and robust evaluation of sessions was not common (see chapter 3.3.3.5 and 3.3.3.6). This makes it challenging for pharmacy educators to recognise and ensure the value of IPE sessions for students.

The diversity in IPE delivered is at least partly due to the autonomy that pharmacy educators have in developing programmes working against an outcomes framework rather than a prescriptive IPE programme from the regulator. IPE is often then developed to address local needs and mitigate against local constraints (O'Halloran et al., 2006; Carpenter and Dickinson, 2014; Neocleous, 2014). This can mean that educators create sessions out of convenience, i.e. with other student groups from programmes where there is a similar drive to actively pursue IPE or with those that are in close proximity. Having been directly involved in the delivery and evaluation of IPE within Cardiff University School of Pharmacy there were a number of factors which were immediately apparent including the need for sessions to be reflective of current practice. This belief was shared with the interview participants as well as within the wider literature (Knowles, 1973; Parsell and Bligh, 1998; van Soeren et al., 2011; Barr et al., 2017). In my opinion, it is therefore essential that educators embed IPE with student groups and on topics which directly reflect current practice (for all professions involved). However, this provides a challenge for pharmacy educators as there is currently a paucity of literature related to pharmacists' interprofessional roles in practice and was therefore explored using questionnaires and interviews with community and hospital pharmacists (see chapters 4, 5 and 6).

Within the interviews many participants indicated that a focus on understanding roles and responsibilities in such sessions is important as this could directly enhance understanding and prevent/mitigate negative or stereotypical perceptions. It was also felt that this topic would be applicable for all HCTMs involved in the care of patients (including GP receptionists and pharmacy staff) as it is vital for all HCTMs to recognise when and with whom interactions would be most beneficial and how each team member fits into the interprofessional team. By ensuring that the roles and responsibilities of HCTMs is an outcome of each IPE session it was felt that this could aid the relevance and therefore

increase the engagement of students. However, participants also stressed the importance of incorporating this topic into a specific practice-based scenario which is ability/specialism appropriate (i.e. develops through the years in line with the curriculum of each HCP) to aid students engagement in sessions.

Another set of topics believed to be of relevance to a range of HCPs (and other team members) and thus would be appropriate for IPE was the development of soft skills such as communication, teamworking and bedside manner. Pharmacists from both hospital and community sectors recognised these skills are essential in improving interprofessional collaboration as they help to build professional and social relationships and enable HCPs to successfully articulate their care messages to the interprofessional team. The negative impact of poor communication was made clear when exploring junior pharmacists' interactions with senior doctors. Junior pharmacists indicated that they found senior doctors to be stressed and time pressured. This they felt led them to be 'short' with junior pharmacists who then felt intimidated and lacked confidence in undertaking interactions with such colleagues. Therefore, by introducing early and repeated IPE at undergraduate as well as at postgraduate level this could help provide pharmacists and other HCPs with an opportunity to enhance their communication skills and so build their confidence.

It was evident from both the questionnaire and interview phases of the studies that community and hospital pharmacists interact most frequently with doctors and nurses, therefore in order for IPE to reflect practice, conducting IPE with these professions would be of particular value. This was a finding reflected within the interviews with the majority of participants believing developing IPE with these HCPs should be prioritised. It was also felt that having sessions that feature pharmacy, medical and nursing students simultaneously would be beneficial, however this may be challenging particularly in terms of logistics.

Whilst the frequency of interactions with individual HCPs varied across the two sectors, on the whole interactions with doctors were similar in terms of the themes of the interactions and therefore can help provide a valuable platform for the development of IPE sessions which are reflective of practice. Pharmacists' IPIs with doctors were predominately focused on clinical issues such as determining or confirming medication appropriateness, particularly in areas such as dosing, interactions, formulation and indication. This said, tailoring IPE to each healthcare sector may help retain relevance and therefore it may be helpful to including patient care plans, discharge and admissions, blood results and clinical

governance issues for hospital-based pharmacists and doctors, and prescription writing and the delivery of joint services (such as DMRs and MURs) for primary care-based HCPs.

IPIs with nurses often focused on the patient with respect to ongoing care and general wellbeing, as well as practical issues such as stock and supply of medication. Although IPIs were sometimes clinical in nature, compared to doctors this was far less frequent, therefore the findings from this study suggest that IPE surrounding the ongoing holistic care of patients would be of value with nurses. Beyond the common themes articulated above, it was interesting to see that the nature of interaction with nurses varied quite considerably between sectors. This was generally seen to be due to the differences in the nurse role. In primary care, nurses were often non-medical prescribers and therefore interactions with community pharmacists were more commonly related to prescription issues as well as vaccinations and dressings, and could thus be valuable IPE topics for community based practitioners. This was in contrast to secondary care where pharmacists often approached nurses for more in-depth patient information such as how the patient is coping, their weight and ability to take medications (patients' swallowing ability and compliance). Also, as nurses were regularly administering medications within hospital, pharmacists frequently discussed issues such as administering medications in patients with swallowing difficulties and determining IV infusion rates. These all represent IPE topics that could be meaningful during hospital pharmacist-nurse IPE.

When analysing the IPE sessions currently delivered in UK MPharm programmes significant diversity was apparent in the range of HCTMs participating in IPE sessions. Whilst a number of these sessions did feature nurses and doctors there were a number of schools of pharmacy that did not have IPE sessions with doctors or nurses. This perhaps represents a lost opportunity to engage with the two key professional groups with which pharmacists interact most frequently irrespective of sector of practice. Ensuring that IPE is relevant and meaningful is particularly important since IPE that lacks this approach can be counterproductive and cause students to have negative perceptions of interprofessional engagement (Parsell and Bligh, 1998; van Soeren et al., 2011; Barr et al., 2017).

In addition to doctors and nurses, a significant proportion of hospital pharmacists interacted with a number of other HCPs also co-located in hospitals such as dieticians (third most frequent), physiotherapists, occupational therapists, midwives, social workers and speech and language therapists. As hospital pharmacists' third most frequently interacted with HCP it would be useful to undertake IPE with dieticians related to hospital-based

scenarios such as managing patients who require TPN and/or have electrolyte imbalances to medication/diet. However, it must be noted that interactions with these HCPs (outside of doctors and nurses) were generally found to be dependent on the particular specialism of the pharmacist, with certain specialisms requiring more frequent input from a range of HCPs. The blend of HCPs that community pharmacists interacted with was both different and narrower compared to hospital pharmacists. Interactions were with dentists (third most frequent), health visitors, social workers, opticians, vets and midwives. This variation in the HCPs that pharmacists interact with probably highlights the differences in services provided and the types of patients seen in the two sectors. Of note, community pharmacists' interactions with dentists included confirming the appropriateness of medicines (particularly in areas such as dosing, interactions, formulation, indication, allergies) and prescription writing and therefore may be appropriate scenarios for community-based IPE sessions.

Throughout the study, interprofessional interactions were found to occur across sectors i.e. between primary and secondary care. These interactions often involved the transfer of information or clarification of a patient's medicines. This was often due to the medicines reconciliation process undertaken when patients were admitted to hospital or when interacting around alterations to medicines when patients were discharged from hospital back into the community. Primarily this meant pharmacists were interacting with doctors and nurses as well as pharmacy colleagues from the opposite care sectors. These engagements could provide a further opportunity for IPE and could help express the importance of interprofessional interactions across care sectors.

It was also suggested that engaging members of the wider health care team (GP receptionist, the pharmacy team etc) in IPE would be beneficial in reinforcing effective team working and developing positive relationships due to the frequent nature with which pharmacists from both sectors interact (although predominantly community pharmacists). It was suggested that IPE with receptionists may reduce barriers as the two would have a better understanding of one another's roles which could possibly lead pharmacists having increased engagement with other HCPs owing to the receptionist's gatekeeper role.

Whilst a small number of participants felt that pharmacists should be more aware of their own roles before undertaking IPE and therefore believe IPE should be exclusively conducted at postgraduate level, the majority of participants were significantly in favour of early and frequent IPE at undergraduate level. This was generally desired as it enabled

students to develop their interprofessional practice overtime, build interprofessional relationships and prevent negative perceptions forming.

A number of other factors have been identified within the literature which should be considered when developing sessions, this includes the belief that topics and learning outcomes should be disseminated to students prior to undertaking IPE to help them recognise the relevance of sessions and frame their learning. These learning outcomes should also be assessed to ensure they are being met during sessions. Additionally, when sessions are being designed educators should ensure that appropriate educational strategies are employed such as adult learning and authentic learning. This will help to ensure participants are engaged in sessions. The environment in which sessions are conducted can have an impact on ease of engagement and therefore selecting settings that facilitate interactions such as workshop rooms, placements or through simulation could enhance the effectiveness of such sessions. Utilising a range and blend of these sessions could also be of value in providing variation for students, with the introduction of virtual IPE sessions (online resources etc.) also a possibility when used alongside these methods. In order to make sure students' perceptions of IPE and interprofessional engagement are positive it is important to evaluate each session, preferably using a mixed methods, longitudinal analysis.

### **7.2.1. Recommendations for the design and delivery of interprofessional education**

Whilst a number of suggestions for general development of IPE that is relevant for pharmacy students based on the studies conducted have been discussed above, the research also identified a series of recommendations which would be of value if actioned at an organisational, national or international level. Therefore, listed below are five recommendations which may help improve the provision of both undergraduate and postgraduate IPE and ultimately improve the value of IPE for learners:

1. The continued development of UK special interest groups such as CAIPE which represent a diversity of HCPs, regulatory bodies, IPE researchers, patients and other stakeholders is important in order to create more specific guidance for educators surrounding the provision of IPE. This guidance should help educators in recognising the professions, topics and settings which will ensure students undertake IPE that is relevant and meaningful for future practice
2. IPE should be introduced early and repeatedly throughout undergraduate level, with many interviewees believing it should also be incorporated within postgraduate education (although further research would be needed into this level)

3. This will help students build on previous sessions and reinforce interprofessional collaboration as an essential skill rather than a 'bolt on'. Having earlier sessions can also increase HCPs' confidence in undertaking interactions, providing a strong foundation for interprofessional practice and reducing the potential for missed collaborative opportunities (see chapter 6.3.2.2.6)
4. Given the provision of formal IPE at postgraduate level appears to be sporadic, introducing more robust mechanisms for the engagement and delivery of IPE would be beneficial in allowing HCPs to share their experiences, reinforce their roles and responsibilities and ultimately develop their interprofessional collaborative practice (see chapter 6.3.2.2.6). It would be preferable for these to occur before starting new rotations/specialisms, in order to develop specific interprofessional collaborative relationships within their relevant workplace. This could be implemented through a number of mechanisms including as a formal element of an NHS employee's contract and development plan, and as an embedded component of postgraduate taught courses such as the clinical diploma or non-medical prescribing courses. Before implementing this, further research would be required into the provision of pharmacy postgraduate IPE as there is currently a paucity of literature in this area
5. One key reason IPE is so varied is because of a paucity of published research that effectively demonstrates benefits to practice and patient care. By promoting and funding more research and encouraging educators to evaluate sessions and assess students on learning outcomes this could help develop an evidence base that would enable the development of relevant and meaningful IPE
6. Continue to promote IPE across healthcare and at a government level encourage IPE as a required aspect in all healthcare qualifications thus widening the desire for HCP programmes to participate in IPE sessions with pharmacists (if relevant).

### **7.3. Future research**

Whilst this study has helped to address a number of gaps within the literature related to interprofessional interactions and collaboration, it is clear that there is still some way to go to fully understand pharmacists' interprofessional role within practice and ensure that any IPE that is developed to address this is relevant and helps improve interprofessional interactions.

Although this study has explored pharmacist's views on IPIs and IPE, by expanding this research to explore the opinions of other HCPs, particularly doctors and nurses, this could

help to provide further understanding of the pharmacists' role (both real and perceived) within the interprofessional team, identify recommendations for improving collaborative practice and ensure that IPE sessions are meaningful and relevant for all HCPs. Furthermore, as the role of pharmacists within GP practices has expanded in recent years (Royal Pharmaceutical Society, 2017b) and particularly in Wales it would be valuable to open the study out to 'primary care' pharmacists in order to determine similarities and difference in interprofessional practice compared to community and hospital pharmacists. Another area of pharmacy that would be interesting to explore is the interprofessional role of the locum pharmacists as their role often sees them rotate around interprofessional teams. This would provide a challenge in embedding such individuals in interprofessional teams which may be compounded by evidence suggesting that GPs can be reluctant in trusting locum pharmacists (Bradley et al., 2012). Locum pharmacists were underrepresented in this current study due to the requirement for pharmacists to work at least two days a week within their practice setting.

Interviews were conducted until the sample represented a cross section of pharmacists, there was strong repetition of data and themes, and the study aims had been achieved, however it is difficult to state that new data or themes may not have been determined through conducting further interviews (Bowen, 2008; King and Horrocks, 2010a; Malterud et al., 2015). This limitation was accentuated by the lack of representation from pharmacists based in West or Central Wales, with the majority of participants generally working around the South Wales area due to time and geographical convenience, therefore undertaking interviews with pharmacists from these areas may add value. Furthermore, as pharmacists' specialisms within hospitals were seen to be broad and had some impact on the HCPs that pharmacists interacted with, interviewing more pharmacists from a wider range of specialisms would be valuable. Another limitation to both stages of this study was that the study population centred solely on pharmacists from within Wales, and although the GPhC regulates pharmacists from across the UK and therefore there will be many similarities with other UK countries, as NHS healthcare is devolved into the four UK countries there may evidently be some differences in pharmacists interprofessional practice. Further work would be required in order to explore these similarities and differences.

Although the mixed method approach was valuable in achieving the research aims, it would be useful to conduct observational studies to identify if there are any differences between pharmacists' reported interactions and those actually undertaken.

One of the major limitations that policy makers face when striving for greater levels of interprofessional collaboration is demonstrating its explicit value. Whilst it is believed both nationally and internationally that it improves patient care (World Health Organisation, 2010; Department of Health, 2013a) there is no robust evidence that this is the case, therefore studies should be designed and conducted to directly assess improvements in patient outcomes as a result of interprofessional care.

As there is currently limited research assessing the long-term trends of interprofessional collaboration it would also be interesting to follow up this research in 10 to 15 years at which point it would be hoped that the national drivers combined with the incorporation of more extensive IPE into healthcare programmes will have resulted in more frequent and fruitful interprofessional teamworking. Furthermore, with the expansion of pharmacists' roles leading to better utilisation of pharmacists' clinical skills showing no signs of slowing down, this may have significant impact on their role within the interprofessional team. One area that has already seen development since the time of the community study in this thesis is that hospital pharmacists in certain areas of Wales now have access to patient's summary of care records through the Welsh GP Records scheme (NHS Wales, 2018c), with the aim to get community pharmacists similar access (already common across NHS England)(Pharmaceutical Services Negotiating Committee, 2018) therefore it would be interesting to determine if this has had any impact on the IPIs conducted.

One specific finding from the hospital questionnaire that would also be interesting to explore is why the hospital size had significant impacts on hospital pharmacists' IPIs. Here hospital pharmacists were found to interact significantly more frequently with some professions such as nurses, midwives and speech and language therapists in smaller hospitals but interacted with dieticians more frequently in larger hospitals. Observational studies would be useful in addressing this research question.

Whilst the study clearly identified the significant volume of IPE delivered in undergraduate MPharm programmes, the extent of postgraduate IPE is still generally unknown (outside of the small number of experiences described by interview participants). It would therefore be valuable to determine and explore pharmacists' opportunities and experiences of postgraduate IPE, possibly by surveying or interviewing postgraduate educators across a range of institutions.

A number of recommendations have been made towards embedding IPIs in practice and delivering IPE in a more strategic fashion. Conducting research to determine the impacts of these recommendations (where they are implemented) would be valuable. One way to do this is by developing IPE sessions based on recommendations and then evaluating these sessions through the use of mixed methods. Areas of particular interest and value would include measurement of student outcomes pre and post session, determination of students' perceptions of these sessions (preferably through qualitative interviews) and observational review of sessions. Ideally this research would also include a longitudinal randomised control trial comparing student development of interprofessional skills. In utilising a number of different methods to determine the value of sessions this would help add to an area of which there is little robust data.

#### **7.4. Conclusion**

This mixed method study identified that whilst some pharmacists are embedded within the interprofessional team and regularly engage in interprofessional collaboration this is not currently a universal method of practice. A range of organisational and practical facilitators and barriers were cited as potential reasons for this, prompting a number of recommendations at both micro and macro level that aim to further expand and develop interprofessional collaboration and teamworking across the pharmacy profession. One method recognised to benefit interprofessional collaboration is IPE that is reflective of current practice. However, the provision of IPE across UK schools of pharmacy lacks a cohesive strategic design, likely due to limited guidance on IPE from the regulator, a limited evidence base and local constraints. This may limit the value of such IPE sessions that are often opportunistic in their design and delivery. This study therefore provides a number of recommendations that can aid educators in the development of relevant and meaningful sessions to help improve interprofessional teamworking skills and ultimately enhance the provision of effective patient-oriented interprofessional care.

**Bibliography**

- ABU-RISH, E., KIM, S., CHOE, L., VARPIO, L., MALIK, E., WHITE, A. A., CRADDICK, K., BLONDON, K., ROBINS, L., NAGASAWA, P., THIGPEN, A., CHEN, L. L., RICH, J. & ZIERLER, B. 2012. Current trends in interprofessional education of health sciences students: a literature review. *J Interprof Care*, 26, 444-51.
- AL HAMARNEH, Y. N., HEMMELGARN, B. R., HASSAN, I., JONES, C. A. & TSUYUKI, R. T. 2017. The Effectiveness of Pharmacist Interventions on Cardiovascular Risk in Adult Patients with Type 2 Diabetes: The Multicentre Randomized Controlled RxEACH Trial. *Canadian Journal of Diabetes*, 41, 580-586.
- ALLEN, D. 2002. Time and space on the hospital ward: Shaping the scope of nursing practice. *Nursing and the Division of Labour in Healthcare*. Springer.
- ANDREWS, J. & BUTLER, M. 2014. Trusted to care. *Stirling, Scotland: Dementia Services Development*.
- AUDITOR GENERAL FOR WALES 2016. Managing medicines in primary and secondary care. Cardiff: Wales Audit Office.
- AUTA, A., STRICKLAND-HODGE, B. & MAZ, J. 2017. There is still a case for a generic qualitative approach in some pharmacy practice research. *Research in Social and Administrative Pharmacy*, 13, 266-268.
- AXON, D. R., LIM, R. H. M., LEWIS, P. J., SANDHER, S., THONDEE, J., EDWARDS, K. & HOWARD, R. L. 2018. Junior doctors' communication with hospital pharmacists about prescribing: findings from a qualitative interview study. *European Journal of Hospital Pharmacy*.
- BABBIE, E. 2015a. Analysing qualitative data. *The practice of social research*. Fourteenth ed. Canada: Wadsworth, Cengage Learning.
- BABBIE, E. 2015b. Inquiry, theory and paradigms. *The practice of social research*. Fourteenth ed. Canada: Wadsworth, Cengage Learning.
- BABBIE, E. 2015c. Sample logic. *The practice of social research*. Fourteenth ed. Canada: Wadsworth, Cengage Learning.
- BABBIE, E. 2015d. Surveys. *The practice of social research*. Fourteenth ed. Canada: Wadsworth, Cengage Learning.
- BAKER, L., EGAN-LEE, E., MARTIMIANAKIS, M. A. & REEVES, S. 2011. Relationships of power: Implications for interprofessional education. *Journal of Interprofessional Care*, 25, 98-104.
- BÄLTER, K. A., BÄLTER, O., FONDELL, E. & LAGERROS, Y. T. 2005. Web-Based and Mailed Questionnaires: "A Comparison of Response Rates and Compliance". *Epidemiology*, 577-579.
- BARBOUR, R. S. & BARBOUR, M. 2003. Evaluating and synthesizing qualitative research: the need to develop a distinctive approach. *Journal of evaluation in clinical practice*, 9, 179-186.
- BARDET, J.-D., VO, T.-H., BEDOUCH, P. & ALLENET, B. 2015. Physicians and community pharmacists collaboration in primary care: A review of specific models. *Research in Social and Administrative Pharmacy*, 11, 602-622.
- BARR, H. 2000. Working together to learn together: learning together to work together. *Journal of Interprofessional Care*, 14, 177-179.
- BARR, H. 2002a. Interprofessional education. *Educational strategies*, 187-192.
- BARR, H. 2002b. Interprofessional Education: Today, Yesterday and Tomorrow. The Learning and Teaching Support Network for Health Sciences & Practice and The UK Centre for the Advancement of Interprofessional Education.
- BARR, H., GRAY, R., HELME, M., LOW, H. & REEVES, S. 2017. Interprofessional education guidelines. *London: CAIPE*.
- BARR, H., HAMMICK, M., KOPPEL, I. & REEVES, S. 1999. Evaluating interprofessional education: two systematic reviews for health and social care. *British Educational Research Journal*, 25, 533-544.
- BARR, H., HELME, M. & D'AVRAY, L. 2014. Review of interprofessional education in the United Kingdom 1997-2013. *London: CAIPE*.
- BARR, H., KOPPEL, I., REEVES, S., HAMMICK, M. & FREETH, D. 2005. *Effective interprofessional education: Assumption, argument and evidence.*, Oxford, UK, Blackwell.
- BARRETT, G., SELLMAN, D. & THOMAS, J. 2005. *Interprofessional working in health and social care: professional perspectives*, Palgrave Macmillan.
- BAUER, H. & BRIGHI, E. 2002. Editorial note. *Millennium: Journal of international studies*, 31.
- BAXTER, S. K. & BRUMFITT, S. M. 2008. Benefits and losses: a qualitative study exploring healthcare staff perceptions of teamworking. *Quality and Safety in Health Care*, 17, 127-130.
- BIENKOWSKA-GIBBS, T., KING, S., SAUNDERS, C. & HENHAM, M.-L. 2015. *New organisational models of primary care to meet the future needs of the NHS: a brief overview of recent reports*, RAND.
- BLACK, D. A., TAGGART, J., JAYASINGHE, U. W., PROUDFOOT, J., CROOKES, P., BEILBY, J., POWELL-DAVIS, G., WILSON, L. & HARRIS, M. F. 2013. The Teamwork Study: enhancing the role of

## Bibliography

- non-GP staff in chronic disease management in general practice. *Australian Journal of Primary Health*, 19, 184-189.
- BLAND, J. M. & ALTMAN, D. G. 1997. Statistics notes: Cronbach's alpha. *BMJ: British Medical Journal*, 314, 572.
- BOGDEN, P. E., KOONTZ, L. M., WILLIAMSON, P. & ABBOTT, R. D. 1997. The physician and pharmacist team: An effective approach to cholesterol reduction. *Journal of General Internal Medicine*, 12, 158-164.
- BOWEN, G. A. 2008. Naturalistic inquiry and the saturation concept: a research note. *Qualitative Research*, 8, 137-152.
- BRADLEY, F. 2012. *Exploring interactions between General Practitioners and Community Pharmacists: a novel application of social network analysis*. University of Manchester.
- BRADLEY, F., ASHCROFT, D. M. & NOYCE, P. R. 2012. Integration and differentiation: a conceptual model of general practitioner and community pharmacist collaboration. *Research in Social and Administrative Pharmacy*, 8, 36-46.
- BRAITHWAITE, J., WESTBROOK, M., NUGUS, P., GREENFIELD, D., TRAVAGLIA, J., RUNCIMAN, W., FOXWELL, A. R., BOYCE, R. A., DEVINNEY, T. & WESTBROOK, J. 2012. A four-year, systems-wide intervention promoting interprofessional collaboration. *BMC Health Services Research*, 12, 99.
- BRAITHWAITE, J., WESTBROOK, M., NUGUS, P., GREENFIELD, D., TRAVAGLIA, J., RUNCIMAN, W., FOXWELL, A. R., BOYCE, R. A., DEVINNEY, T. & WESTBROOK, J. 2013. Continuing differences between health professions' attitudes: the saga of accomplishing systems-wide interprofessionalism. *International Journal for Quality in Health Care*, 25, 8-15.
- BRAUN, V. & CLARKE, V. 2006. Using thematic analysis in psychology. *Qualitative research in psychology*, 3, 77-101.
- BREWER, M. L. & STEWART-WYNNE, E. G. 2013. An Australian hospital-based student training ward delivering safe, client-centred care while developing students' interprofessional practice capabilities. *Journal of Interprofessional Care*, 27, 482-488.
- BRITISH MEDICAL ASSOCIATION. 2014. *Your GP cares* [Online]. Available: <https://www.bma.org.uk/news/2014/may/care-counts-your-gp-cares-campaign-highlights-workload-pressures> [Accessed 2018].
- BROCK, K. A. & DOUCETTE, W. R. 2004. Collaborative working relationships between pharmacists and physicians: an exploratory study. *Journal of the American Pharmacists Association*, 44, 358-365.
- BROWN, J. B., BOLES, M., MULLOOLY, J. P. & LEVINSON, W. 1999. Effect of clinician communication skills training on patient satisfaction: a randomized, controlled trial. *Annals of Internal Medicine*, 131, 822-829.
- BRYANT, L. J. M., COSTER, G., GAMBLE, G. D. & MCCORMICK, R. N. 2011. The General Practitioner-Pharmacist Collaboration (GPPC) study: a randomised controlled trial of clinical medication reviews in community pharmacy. *International Journal of Pharmacy Practice*, 19, 94-105.
- BURING, S. M., BHUSHAN, A., BROESEKER, A., CONWAY, S., DUNCAN-HEWITT, W., HANSEN, L. & WESTBERG, S. 2009. Interprofessional Education: Definitions, Student Competencies, and Guidelines for Implementation. *American Journal of Pharmaceutical Education*, 73, 59.
- BURT, R. S. 2005. *Brokerage and closure: An introduction to social capital*, Oxford university press.
- CAELLI, K., RAY, L. & MILL, J. 2003. 'Clear as mud': toward greater clarity in generic qualitative research. *International journal of qualitative methods*, 2, 1-13.
- CALLAND, J. F., TURRENTINE, F. E., GUERLAIN, S., BOVBJERG, V., POOLE, G. R., LEBEAU, K., PEUGH, J. & ADAMS, R. B. 2011. The surgical safety checklist: lessons learned during implementation. *The American surgeon*, 77, 1131-1137.
- CAMPBELL, J. C., COBEN, J. H., MCLOUGHLIN, E., DEARWATER, S., NAH, G., GLASS, N., LEE, D. & DURBOROW, N. 2001. An evaluation of a system - change training model to improve emergency department response to battered women. *Academic Emergency Medicine*, 8, 131-138.
- CARPENTER, J. 1995. Doctors and Nurses: Stereotypes and Stereotype Change in Interprofessional Education. *Journal of Interprofessional Care*, 9, 151-161.
- CARPENTER, J., BARNES, D., DICKINSON, C. & WOOFF, D. 2006. Outcomes of interprofessional education for Community Mental Health Services in England: The longitudinal evaluation of a postgraduate programme. *Journal of Interprofessional Care*, 20, 145-161.
- CARPENTER, J. & DICKINSON, H. 2014. *Interprofessional education and training*, Policy Press.

- CARTER, P. 2016. Operational productivity and performance in English NHS acute hospitals: Unwarranted variations. An independent report for the Department of Health by Lord Carter of Coles. *London: Department of Health*.
- CATCHPOLE, K. R., DE LEVAL, M. R., MCEWAN, A., PIGOTT, N., ELLIOTT, M. J., MCQUILLAN, A., MACDONALD, C. & GOLDMAN, A. J. 2007. Patient handover from surgery to intensive care: using Formula 1 pit - stop and aviation models to improve safety and quality. *Pediatric Anesthesia*, 17, 470-478.
- CENTRE FOR WORKFORCE INTELLIGENCE 2014. In-depth Review of the General Practitioner Workforce: Final Report.
- CHANG, W. Y., MA, J. C., CHIU, H. T., LIN, K. C. & LEE, P. H. 2009. Job satisfaction and perceptions of quality of patient care, collaboration and teamwork in acute care hospitals. *Journal of advanced nursing*, 65, 1946-1955.
- CHARROIS, T. L., ZOLEZZI, M., KOSHMAN, S. L., PEARSON, G., MAKOWSKY, M., DUREC, T. & TSUYUKI, R. T. 2012. A Systematic Review of the Evidence for Pharmacist Care of Patients With Dyslipidemia. *Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy*, 32, 222-233.
- CHEATER, F. M., HEARNshaw, H., BAKER, R. & KEANE, M. 2005. Can a facilitated programme promote effective multidisciplinary audit in secondary care teams? An exploratory trial. *International Journal of Nursing Studies*, 42, 779-791.
- CLARK, P. G. 2014. Narrative in inter-professional education and practice: implications for professional identity, provider-patient communication and teamwork. *Journal of Interprofessional Care*, 28, 34-39.
- CLEGG, F. 2001. Simple chi-squared. *Simple statistics: A course book for the social sciences*. Cambridge University Press.
- CLOUDER, D. L., GOODMAN, S., BLUTEAU, P., JACKSON, A., DAVIES, B. & MERRIMAN, L. 2011. An investigation of "agreement" in the context of interprofessional discussion online: A "netiquette" of interprofessional learning? *Journal of Interprofessional Care*, 25, 112-118.
- COMMUNITY PHARMACY WALES. 2015. *Community Pharmacies in Wales* [Online]. Available: <http://www.cpwales.org.uk/CPW-s-work/About/Community-Pharmacies-in-Wales.aspx> [Accessed 2018].
- COMMUNITY PHARMACY WALES. 2017. *Information on services provided by community pharmacies in Wales* [Online]. Available: <http://www.cpwales.org.uk/getattachment/Home/20121113-information-on-services-Copy.pdf.aspx?lang=en-GB> [Accessed 2018].
- COMMUNITY PHARMACY WALES. 2018. *2018/19 Collaborative Working Scheme* [Online]. Available: <http://www.cpwales.org.uk/getattachment/Services-and-commissioning/Collaborative-Working/20180413-ContractorNews-Collaborative-Working-Scheme-2018-19.pdf.aspx?lang=en-GB> [Accessed 2018].
- CONN, L. G., LINGARD, L., REEVES, S., MILLER, K.-L., RUSSELL, A. & ZWARENSTEIN, M. 2009. Communication Channels in General Internal Medicine: A Description of Baseline Patterns for Improved Interprofessional Collaboration. *Qualitative Health Research*, 19, 943-953.
- COOPER, S. & ENDACOTT, R. 2007. Generic qualitative research: a design for qualitative research in emergency care? *Emergency Medicine Journal*, 24, 816-819.
- CORBIN, J. & STRAUSS, A. 2008. Practical considerations. *Basics of qualitative research*. Third ed. London: Sage Publications.
- COTTERILL, S. T. 2012. Introduction. *Team psychology in sports: Theory and practice*. Routledge.
- COUGHLIN, S. S. 1990. Recall bias in epidemiologic studies. *Journal of clinical epidemiology*, 43, 87-91.
- COULMAN, S. A., JOHN, D. N., JENKINS, A., WILKINS, S. J., SWEETLAND, H., HAYES, J., COULSON, J. M., THOMPSON, J. P. & ROUTLEDGE, P. A. 2014. Therapeutics and Prescribing Interprofessional Education (IPE). Medical and Pharmacy Students Working and Learning Together. *Research in Social and Administrative Pharmacy*, 10, e56-e57.
- CRESWELL, J. W. & CRESWELL, J. D. 2017. Mixed Methods Procedures. *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- CRESWELL, J. W. & POTH, C. N. 2017. Five qualitative approaches to inquiry. *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.
- CURLEY, C., MCEACHERN, J. E. & SPEROFF, T. 1998. A firm trial of interdisciplinary rounds on the inpatient medical wards: an intervention designed using continuous quality improvement. *Medical care*, AS4-AS12.

## Bibliography

- CURRAN, V., SARGEANT, J. & HOLLETT, A. 2007. Evaluation of an interprofessional continuing professional development initiative in primary health care. *Journal of Continuing Education in the Health Professions*, 27, 241-252.
- D'AMOUR, D., FERRADA-VIDELA, M., SAN MARTIN RODRIGUEZ, L. & BEAULIEU, M.-D. 2005. The conceptual basis for interprofessional collaboration: Core concepts and theoretical frameworks. *Journal of Interprofessional Care*, 19, 116-131.
- DAVIES, J. E., BARBER, N. & TAYLOR, D. 2014. What do community pharmacists do?: results from a work sampling study in London. *International Journal of Pharmacy Practice*, 22, 309-318.
- DENECKERE, S., EUWEMA, M., LODEWIJCKX, C., PANELLA, M., MUTSVARI, T., SERMEUS, W. & VANHAECHT, K. 2013. Better interprofessional teamwork, higher level of organized care, and lower risk of burnout in acute health care teams using care pathways: a cluster randomized controlled trial. *Medical care*, 51, 99-107.
- DENZIN, N. K. & LINCOLN, Y. S. 2008. Introduction: The discipline and practice of qualitative research. *Strategies of qualitative inquiry*. Sage Publications.
- DEPARTMENT OF HEALTH 2000. The NHS plan: A plan for investment, a plan for reform. London: Department of Health.
- DEPARTMENT OF HEALTH 2009. NHS Constitution. London.
- DEPARTMENT OF HEALTH 2010. Equity and Excellence: Liberating the NHS. London: Department of Health.
- DEPARTMENT OF HEALTH 2012. Health and Social Care Act 2012. London: Department of Health.
- DEPARTMENT OF HEALTH 2013a. Integrated Care and Support: Our Shared Commitment. London: Department of Health.
- DEPARTMENT OF HEALTH 2013b. The NHS outcomes framework 2014/15. London: Department of Health.
- DEPARTMENT OF HEALTH 2013c. Patients First and Foremost: The Initial Government Response to the Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. London: Department of Health.
- DEPARTMENT OF HEALTH 2015. Learning not blaming: The government response to Freedom to Speak Up, the Public Administration Select Committee report on clinical incidents, and the Morecambe Bay Investigation. London: Department of Health.
- DEPARTMENT OF HEALTH 2016. NHS Outcomes Framework: at-a-glance. London: Department of Health.
- DIACK, H., GIBSON, M., HEALEY, T., BOND, C. & MCKENZIE, H. 2008. The Aberdeen interprofessional health and social care education initiative: Final report. University of Aberdeen and The Robert Gordon University.
- DIXON, J. F., LARISON, K. & ZABARI, M. 2006. Skilled communication: making it real. *AACN advanced critical care*, 17, 376-382.
- DOBSON, R. T., HENRY, C. J., TAYLOR, J. G., ZELLO, G. A., LACHAINE, J., FORBES, D. A. & KEEGAN, D. L. 2006. Interprofessional health care teams: attitudes and environmental factors associated with participation by community pharmacists. *Journal of Interprofessional Care*, 20, 119-132.
- DRINKA, T. J. K., MILLER, T. F. & GOODMAN, B. M. 1996. Characterizing motivational styles of professionals who work on interdisciplinary healthcare teams. *Journal of Interprofessional Care*, 10, 51-61.
- DRISCOLL, D. L., APPIAH-YEBOAH, A., SALIB, P. & RUPERT, D. J. 2007. Merging qualitative and quantitative data in mixed methods research: How to and why not. *Ecological and Environmental Anthropology (University of Georgia)*, 18.
- EDWARDS, N. 2010. The triumph of hope over experience. *NHS Confederation: London*.
- EDWARDS, P., ROBERTS, I., CLARKE, M., DIGUISEPPI, C., PRATAP, S., WENTZ, R. & KWAN, I. 2009. Increasing response rates to postal questionnaires: systematic review. *BMJ: British Medical Journal* 324, 1183.
- EGGINK, R. N., LENDERINK, A. W., WIDDERSHOVEN, J. W. & VAN DEN BEMT, P. M. 2010. The effect of a clinical pharmacist discharge service on medication discrepancies in patients with heart failure. *Pharmacy world & science*, 32, 759-766.
- ELVEY, R., HASSELL, K. & HALL, J. 2013. Who do you think you are? Pharmacists' perceptions of their professional identity. *International Journal of Pharmacy Practice*, 21, 322-332.
- FALCK, H. S. 1977. Interdisciplinary education and implications for social work practice. *Journal of Education for Social Work*, 13, 30-37.
- FRANCIS, R. 2013. Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry: Executive Summary. London: The Stationery Office.

- FRANCIS, R. 2015. Freedom to speak up: An independent review into creating an open and honest reporting culture in the NHS. London: The Stationery Office.
- FRANKEL PRATT, S. 2016. Pragmatism as ontology, not (just) epistemology: Exploring the full horizon of pragmatism as an approach to IR theory. *International Studies Review*, 18, 508-527.
- FREETH, D., HAMMICK, M., KOPPEL, I., REEVES, S. & BARR, H. 2002. A critical review of evaluations of interprofessional education. In: LEARNING AND TEACHING SUPPORT NETWORK, C. F. H. S. A. P. (ed.). London.
- FREETH, D., REEVES, S., KOPPEL, I., HAMMICK, M. & BARR, H. 2005. Evaluating interprofessional education: A self-help guide. *Higher Education Academy: Health Sciences and Practice*.
- FREETH, D. S., HAMMICK, M., REEVES, S., KOPPEL, I. & BARR, H. 2008. *Effective interprofessional education: development, delivery, and evaluation*, John Wiley & Sons.
- FRENK, J., CHEN, L., BHUTTA, Z. A., COHEN, J., CRISP, N., EVANS, T., FINEBERG, H., GARCIA, P., KE, Y. & KELLEY, P. 2010. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The lancet*, 376, 1923-1958.
- FULOP, N., PROTOPSALTIS, G., KING, A., ALLEN, P., HUTCHINGS, A. & NORMAND, C. 2005. Changing organisations: a study of the context and processes of mergers of health care providers in England. *Social Science & Medicine*, 60, 119-130.
- GENERAL MEDICAL COUNCIL 2009. Tomorrows Doctors; Outcomes and standards for undergraduate medical education. London: General Medical Council.
- GENERAL PHARMACEUTICAL COUNCIL 2010. Accreditation of Master of Pharmacy Degrees. London.
- GENERAL PHARMACEUTICAL COUNCIL 2011. Future pharmacists: Standards for the initial education and training of pharmacists. London.
- GENERAL PHARMACEUTICAL COUNCIL 2017. Business plan 2017-20. London.
- GENERAL PHARMACEUTICAL COUNCIL. 2018a. *Accredited MPharm degrees* [Online]. Available: <https://www.pharmacyregulation.org/education/pharmacist/accredited-mpharm-degrees> [Accessed 2018].
- GENERAL PHARMACEUTICAL COUNCIL. 2018b. *Hospital and Community setting* [Online]. Available: <https://www.pharmacyregulation.org/resources/registrant-survey-2013/key-survey-findings/community-hospital-settings> [Accessed 2018].
- GENERAL PHARMACEUTICAL COUNCIL. 2018c. *Pharmacist education and training* [Online]. Available: <https://www.pharmacyregulation.org/education/pharmacist-education> [Accessed 2018].
- GENERAL PHARMACEUTICAL COUNCIL. 2018d. *What does a pharmacist do?* [Online]. Available: <https://www.pharmacyregulation.org/raising-concerns/raising-concerns-about-pharmacy-professional/what-expect-your-pharmacy/what-does-0> [Accessed 2018].
- GEURTS, M. M. E., TALSMA, J., BROUWERS, J. R. B. J. & DE GIER, J. J. 2012. Medication review and reconciliation with cooperation between pharmacist and general practitioner and the benefit for the patient: a systematic review. *British Journal of Clinical Pharmacology*, 74, 16-33.
- GOLAFSHANI, N. 2003. Understanding reliability and validity in qualitative research. *The qualitative report*, 8, 597-606.
- GORDON, M., UPPAL, E., HOLT, K., LYTHGOE, J., MITCHELL, A. & HOLLINS-MARTIN, C. 2013. Application of the team objective structured clinical encounter (TOSCE) for continuing professional development amongst postgraduate health professionals. *Journal of interprofessional care*, 27, 191-193.
- GREEN, L., FRYER JR, G., YAWN, B., LANIER, D. & DOVEY, S. 2001. Ecology of medical care. *New England Journal of Medicine*, 344, 5.
- GREINER, A. C. & KNEBEL, E. 2003. The core competencies needed for health care professionals. *Health Professions Education: A Bridge to Quality*. Washington (DC): National Academies Press (US).
- GUEST, C., SMITH, L., BRADSHAW, M. & HARDCASTLE, W. 2002. Facilitating interprofessional learning for medical and nursing students in clinical practice. *Learning in Health and Social Care*, 1, 132-138.
- HALL, P. 2005. Interprofessional teamwork: Professional cultures as barriers. *Journal of Interprofessional care*, 19, 188-196.
- HALL, P. & WEAVER, L. 2001. Interdisciplinary education and teamwork: a long and winding road. *Medical education*, 35, 867-875.
- HAM, C., IMISON, C. & JENNINGS, M. 2010. Avoiding hospital admissions; Lessons from evidence and experience. *The Kings Fund*, 7-8.

## Bibliography

- HAMMAR, M. B. F. M. 2000. Strategies and focus at an integrated, interprofessional training ward. *Journal of Interprofessional Care*, 14, 337-350.
- HAMMICK, M., FREETH, D., KOPPEL, I., REEVES, S. & BARR, H. 2007. A best evidence systematic review of interprofessional education: BEME Guide no. 9. *Medical teacher*, 29, 735-751.
- HARDEN, R. M. 2015. Interprofessional education: The magical mystery tour now less of a mystery. *Anatomical sciences education*, 8, 291-295.
- HARDEN, R. M. & GLEESON, F. A. 1979. Assessment of clinical competence using an objective structured clinical examination (OSCE). *Medical Education*, 13, 39-54.
- HARDEN, R. M. & STAMPER, N. 1999. What is a spiral curriculum? *Medical teacher*, 21, 141-143.
- HELMREICH, R. L., MERRITT, A. C. & WILHELM, J. A. 1999. The evolution of crew resource management training in commercial aviation. *The international journal of aviation psychology*, 9, 19-32.
- HENDERSON, C. D., BROESEKER, A. E., BERRY, C. G., FORT, D. N., THOMASON, A. R., CAHOON, T. M. & KARLET, M. C. 2013. Interprofessional education sessions involving doctor of pharmacy, bachelor of science in nursing, and nurse anesthetist students. *Currents in Pharmacy Teaching and Learning*, 5, 458-469.
- HINTON, P. R. 2014. Analysing frequency data - chi-square. *Statistics explained*. East Sussex, UK: Routledge.
- HODSON, K., BLENKINSOPP, A., COHEN, D., LONGLEY, M., ALAM, M., DAVIES, P., HUGHES, L., JAMES, D., O'BRIEN, C. & SMITH, M. 2014. Evaluation of the discharge medicines review service. *Welsh Institute for Health and Social Care, University of South Wales*.
- HOLLAND, R., LENAGHAN, E., HARVEY, I., SMITH, R., SHEPSTONE, L., LIPP, A., CHRISTOU, M., EVANS, D. & HAND, C. 2005. Does home based medication review keep older people out of hospital? The HOMER randomised controlled trial. *BMJ: British Medical Journal*, 330, 293.
- HUGHES, C. M. & MCCANN, S. 2003. Perceived interprofessional barriers between community pharmacists and general practitioners: a qualitative assessment. *British Journal of General Practice*, 53, 600-606.
- HUSBAND, A. K., TODD, A. & FULTON, J. 2014. Integrating Science and Practice in Pharmacy Curricula. *American Journal of Pharmaceutical Education*, 78, 63.
- HYLIN, U. 2010. *Interprofessional education: Aspects on learning together on an interprofessional training ward*. PhD Thesis, Department of Clinical Science and Education, Södersjukhuset, Karolinska Institutet, Stockholm, Sweden.
- HYLIN, U., NYHOLM, H., MATTIASSON, A.-C. & PONZER, S. 2007. Interprofessional training in clinical practice on a training ward for healthcare students: A two-year follow-up. *Journal of Interprofessional Care*, 21, 277-288.
- ILLINGWORTH, P. & CHELVANAYAGAM, S. 2017. The benefits of interprofessional education 10 years on. *British Journal of Nursing*, 26, 813-818.
- IRVINE, A. 2011. Duration, dominance and depth in telephone and face-to-face interviews: A comparative exploration. *International Journal of Qualitative Methods*, 10, 202-220.
- ISSENBERG, B. S., MCGAGHIE, W. C., PETRUSA, E. R., LEE GORDON, D. & SCALESE, R. J. 2005. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Medical Teacher*, 27, 10-28.
- ISSENBERG, S. B. & SCALESE, R. J. 2008. Simulation in health care education. *Perspectives in biology and medicine*, 51, 31-46.
- JACOBSEN, F., FINK, A. M., MARCUSSEN, V., LARSEN, K. & BÆK HANSEN, T. 2009. Interprofessional undergraduate clinical learning: Results from a three year project in a Danish Interprofessional Training Unit. *Journal of Interprofessional Care*, 23, 30-40.
- JELPHS, K., DICKINSON, H. & MILLER, R. 2016. What is teamworking and why does it matter? *Working in teams*. Bristol: Policy Press.
- JENKINS, A. 2013. An evaluation of Interprofessional Education (IPE) sessions conducted between Medicine and Pharmacy students at Cardiff University. In: PROJECT, M. R. (ed.). Cardiff School of Pharmacy and Pharmaceutical sciences.
- JENKINS, A. I., HUGHES, M. L., MANTZOURANI, E. & SMITH, M. W. 2016. Too far away to work with each other: Does location impact on pharmacists' perceptions of interprofessional interactions? *Journal of Interprofessional Care*, 30, 678-81.
- JOHNSON, R. B. & ONWUEGBUZIE, A. J. 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, 33, 14-26.
- JONASSEN, D. H. 1999. Designing constructivist learning environments. *Instructional design theories and models: A new paradigm of instructional theory*, 2, 215-239.

- JONES, A. 2006. Multidisciplinary team working: Collaboration and conflict. *International Journal of Mental Health Nursing*, 15, 19-28.
- JONES, K. M., BLUMENTHAL, D. K., BURKE, J. M., CONDREN, M., HANSEN, R., HOLIDAY-GOODMAN, M. & PETERSON, C. D. 2012. Interprofessional education in introductory pharmacy practice experiences at US colleges and schools of pharmacy. *American journal of pharmaceutical education*, 76.
- JUBRAJ, B., MARVIN, V., POOTS, A. J., PATEL, S., BOVILL, I., BARNETT, N., ISSEN, L. & BELL, D. 2015. A pilot survey of junior doctors' attitudes and awareness around medication review: time to change our educational approach? *European Journal of Hospital Pharmacy*, 22, 243-248.
- KABOLI, P. J., HOTH, A. B., MCCLIMON, B. J. & SCHNIPPER, J. L. 2006. Clinical pharmacists and inpatient medical care: a systematic review. *Archives of internal medicine*, 166, 955-964.
- KARNON, J., CAMPBELL, F. & CZOSKI - MURRAY, C. 2009. Model - based cost - effectiveness analysis of interventions aimed at preventing medication error at hospital admission (medicines reconciliation). *Journal of evaluation in clinical practice*, 15, 299-306.
- KING, N. & HORROCKS, C. 2010a. Carrying out qualitative interviews *Interviews in qualitative research*. Sage Publications.
- KING, N. & HORROCKS, C. 2010b. An introduction to interview data analysis. *Interviews in qualitative research*. Sage Publications.
- KIRK, R. E. 1982. *Experimental design*, Wiley Online Library.
- KIRKUP, B. 2015. The report of the Morecambe Bay investigation. *The Stationery Office, London*.
- KNOWLES, M. 1973. Exploring the strange world of learning theory. *The adult learner: a neglected species*. Texas, USA: Gulf Publishing Company.
- KOSHMAN, S. L., CHARROIS, T. L., SIMPSON, S. H., MCALISTER, F. A. & TSUYUKI, R. T. 2008. Pharmacist care of patients with heart failure: a systematic review of randomized trials. *Archives of Internal Medicine*, 168, 687-694.
- KUMAR, R. 2014. *Research Methodology: A step-by-step guide for beginners*, Sage.
- KVALE, S. 2007. Planning an interview study. *Doing interviews*. London: Sage Publications.
- KVARNSTRÖM, S. 2008. Difficulties in collaboration: A critical incident study of interprofessional healthcare teamwork. *Journal of Interprofessional Care*, 22, 191-203.
- KWINT, H.-F., BERMINGHAM, L., FABER, A., GUSSEKLOO, J. & BOUVY, M. L. 2013. The relationship between the extent of collaboration of general practitioners and pharmacists and the implementation of recommendations arising from medication review. *Drugs & aging*, 30, 91-102.
- LALONDE, L., HUDON, E., GOUDREAU, J., BÉLANGER, D., VILLENEUVE, J., PERREAULT, S., BLAIS, L. & LAMARRE, D. 2011. Physician-pharmacist collaborative care in dyslipidemia management: the perception of clinicians and patients. *Research in Social and Administrative Pharmacy*, 7, 233-245.
- LAPKIN, S., LEVETT-JONES, T. & GILLIGAN, C. 2012. A cross-sectional survey examining the extent to which interprofessional education is used to teach nursing, pharmacy and medical students in Australian and New Zealand Universities. *Journal of Interprofessional Care*, 26, 390-396.
- LAPKIN, S., LEVETT-JONES, T. & GILLIGAN, C. 2013. A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today*, 33, 90-102.
- LARKIN, C. & CALLAGHAN, P. 2005. Professionals' perceptions of interprofessional working in community mental health teams. *Journal of Interprofessional Care*, 19, 338-346.
- LATIF, A., BOARDMAN, H. F. & POLLOCK, K. 2013a. Understanding the patient perspective of the English community pharmacy Medicines Use Review (MUR). *Research in Social and Administrative Pharmacy*, 9, 949-957.
- LATIF, A., POLLOCK, K. & BOARDMAN, H. F. 2013b. Medicines use reviews: a potential resource or lost opportunity for general practice? *BMC family practice*, 14, 57.
- LEVETT-JONES, T., GILLIGAN, C., LAPKIN, S. & HOFFMAN, K. 2012. Interprofessional education for the quality use of medicines: designing authentic multimedia learning resources. *Nurse education today*, 32, 934-938.
- LINDQVIST, S., DUNCAN, A., SHEPSTONE, L., WATTS, F. & PEARCE, S. 2005. Case-based learning in cross-professional groups - the development of a pre-registration interprofessional learning programme. *Journal of Interprofessional Care*, 19, 509-520.
- LIU, Y., DOUCETTE, W. R. & FARRIS, K. B. 2010. Examining the development of pharmacist-physician collaboration over 3 months. *Research in Social and Administrative Pharmacy*, 6, 324-333.
- LOMBARDI, M. M. 2007. Authentic learning for the 21st century: An overview. *Educause learning initiative*, 1, 1-12.

## Bibliography

- LONG, A. F., KNEAFSEY, R. & RYAN, J. 2003. Rehabilitation practice: challenges to effective team working. *International Journal of Nursing Studies*, 40, 663-673.
- MAHLER, C., BERGER, S. & REEVES, S. 2015. The Readiness for Interprofessional Learning Scale (RIPLS): A problematic evaluative scale for the interprofessional field. *Journal of interprofessional care*, 29, 289-291.
- MAKOWSKY, M. J., KOSHMAN, S. L., MIDODZI, W. K. & TSUYUKI, R. T. 2009a. Capturing outcomes of clinical activities performed by a rounding pharmacist practicing in a team environment: the COLLABORATE study [NCT00351676]. *Medical care*, 47, 642-650.
- MAKOWSKY, M. J., MADILL, H. M., SCHINDEL, T. J. & TSUYUKI, R. T. 2013. Physician perspectives on collaborative working relationships with team-based hospital pharmacists in the inpatient medicine setting. *International Journal of Pharmacy Practice*, 21, 123-127.
- MAKOWSKY, M. J., SCHINDEL, T. J., ROSENTHAL, M., CAMPBELL, K., TSUYUKI, R. T. & MADILL, H. M. 2009b. Collaboration between pharmacists, physicians and nurse practitioners: A qualitative investigation of working relationships in the inpatient medical setting. *Journal of Interprofessional Care*, 23, 169-184.
- MALTERUD, K., SIERSMA, V. D. & GUASSORA, A. D. 2015. Sample size in qualitative interview studies: guided by information power. *Qualitative health research*, 26, 1753-1760.
- MANTZOURANI, E., WAY, C. M. & HODSON, K. L. 2017. Does an integrated information technology system provide support for community pharmacists undertaking Discharge Medicines Reviews? An exploratory study. *Integrated Pharmacy Research & Practice*, 6, 145-156.
- MAYS, N. & POPE, C. 2000. Assessing quality in qualitative research. *BMJ : British Medical Journal*, 320, 50-52.
- MCDONOUGH, R. & DOUCETTE, W. 2001. Developing collaborative working relationships between pharmacists and physicians. *Journal of the American Pharmaceutical Association*, 41, 682-692.
- MCFADYEN, A. K., WEBSTER, V. S., MACLAREN, W. M. & O'NEILL, M. A. 2010. Interprofessional attitudes and perceptions: Results from a longitudinal controlled trial of pre-registration health and social care students in Scotland. *Journal of Interprofessional Care*, 24, 549-564.
- MEADS, G. & ASHCROFT, J. 2005. Policy into practice. *The Case for Interprofessional Collaboration: In Health and Social Care*. Oxford: Blackwell Publishing.
- MERRIAM, S. B. 1998. *Qualitative Research and Case Study Applications in Education. Revised and Expanded from " Case Study Research in Education."*, ERIC.
- MERRY, A. F., WELLER, J. & MITCHELL, S. J. 2014. Teamwork, Communication, Formula-One Racing and the Outcomes of Cardiac Surgery. *The Journal of Extra-corporeal Technology*, 46, 7-14.
- MILLER, G., FRANKLIN, B. & JACKLIN, A. 2011a. Including pharmacists on consultant-led ward rounds - Response. *Clinical Medicine*, 11, 627-628.
- MILLER, G., FRANKLIN, B. D. & JACKLIN, A. 2011b. Including pharmacists on consultant-led ward rounds: a prospective non-randomised controlled trial. *Clinical Medicine*, 11, 312-316.
- MILLER, G. E. 1990. The assessment of clinical skills/competence/performance. *Academic medicine*, 65, S63-7.
- MOREY, J. C., SIMON, R., JAY, G. D., WEARS, R. L., SALISBURY, M., DUKES, K. A. & BERNS, S. D. 2002. Error reduction and performance improvement in the emergency department through formal teamwork training: evaluation results of the MedTeams project. *Health services research*, 37, 1553-1581.
- MORISON, S. L. & STEWART, M. C. 2005. Developing interprofessional assessment. *Learning in Health and Social Care*, 4, 192-202.
- MORSE, J. M. 2015. Data were saturated. Sage Publications Sage CA: Los Angeles, CA.
- MORSE, J. M., BARRETT, M., MAYAN, M., OLSON, K. & SPIERS, J. 2002. Verification strategies for establishing reliability and validity in qualitative research. *International journal of qualitative methods*, 1, 13-22.
- MOSSIALOS, E., COURTIN, E., NACI, H., BENRIMOJ, S., BOUVY, M., FARRIS, K., NOYCE, P. & SKETRIS, I. 2015. From retailers to health care providers: Transforming the role of community pharmacists in chronic disease management. *Health Policy*, 119, 628-639.
- MYERS VIRTUE, S., ROTZ, M. E., BOYD, M., LYKON, J. L., WALDRON, E. M. & THEODOROU, J. 2017. Impact of a novel interprofessional dental and pharmacy student tobacco cessation education programme on dental patient outcomes. *Journal of Interprofessional Care*, 1-11.
- NADZAM, D. M. 2009. Nurses' role in communication and patient safety. *Journal of Nursing Care Quality*, 24, 184-188.
- NAIK, G. 2006. A hospital races to learn lessons of Ferrari pit stop. *Wall Street Journal*, 14.

- NATIONAL ASSEMBLY FOR WALES 2018. Medicines management. Cardiff: National Assembly for Wales.
- NEOCLEOUS, A. 2014. Interprofessional education: How can it enhance learning? *Whitireia Nursing & Health Journal*, 23.
- NHS ENGLAND 2013. Improving Health and Patient Care Through Community Pharmacy—A Call to Action. London: NHS England.
- NHS ENGLAND 2014a. Community pharmacy—helping provide better quality and resilient urgent care. 2014. London: NHS England.
- NHS ENGLAND 2014b. Five Year Forward View. London: NHS England.
- NHS FUTURE FORUM 2011a. Choice and competition. London.
- NHS FUTURE FORUM 2011b. Integration. London.
- NHS HEALTH EDUCATION ENGLAND. 2015. *Health Careers within the NHS* [Online]. Health Careers. Available: <https://www.healthcareers.nhs.uk/explore-roles> [Accessed 2018].
- NHS HEALTH EDUCATION ENGLAND. 2016. *Pharmacists in emergency departments* [Online]. Available: <https://www.healthcareers.nhs.uk/explore-roles/allied-health-professionals/roles-allied-health-professions/dietitian> [Accessed 2018].
- NHS HEALTH EDUCATION ENGLAND. 2018. *Explore roles - Pharmacist* [Online]. Health careers. Available: <https://www.healthcareers.nhs.uk/explore-roles/pharmacy/pharmacist> [Accessed 2018].
- NHS WALES. 2016. *Health in Wales - Hospitals* [Online]. Available: <http://www.wales.nhs.uk/ourservices/directory/hospitals> [Accessed 2018].
- NHS WALES. 2018a. *Day in the life of a Hospital Pharmacist* [Online]. Abertawe Bro Morgannwg University Health Board. Available: <http://www.wales.nhs.uk/sitesplus/documents/863/Day%20in%20the%20life%20of%20a%20Pharmacist.pdf> [Accessed 2018].
- NHS WALES. 2018b. *Health in Wales - Structure* [Online]. Available: <http://www.wales.nhs.uk/nhswalesaboutus/structure> [Accessed 2018].
- NHS WALES. 2018c. *Welsh GP Record* [Online]. Available: <http://www.gprecord.wales.nhs.uk/home> [Accessed 2018].
- NKANSAH, N., MOSTOVETSKY, O., YU, C., CHHENG, T., BENEY, J., BOND, C. M. & BERO, L. 2010. Effect of outpatient pharmacists' non - dispensing roles on patient outcomes and prescribing patterns. *The Cochrane Library*.
- NORTON, D., TEED, A., GRENFELL, R., MACKAY, C., MACDONALD, C. & MEASDAY, J. 2003. GP-pharmacist liaison: a rural case study. *Australian family physician*, 32, 191.
- NOYCE, P. R. 2007. Providing Patient Care Through Community Pharmacies in the UK: Policy, Practice, and Research. *Annals of Pharmacotherapy*, 41, 861-868.
- NUFFIELD TRUST. 2017. *Facts on staffing and staff shortages in England* [Online]. Available: [www.nuffieldtrust.org.uk/resource/the-nhs-workforce-in-numbers](http://www.nuffieldtrust.org.uk/resource/the-nhs-workforce-in-numbers) [Accessed 2018].
- NUGUS, P., GREENFIELD, D., TRAVAGLIA, J., WESTBROOK, J. & BRAITHWAITE, J. 2010. How and where clinicians exercise power: Interprofessional relations in health care. *Social Science & Medicine*, 71, 898-909.
- O'HALLORAN, C., HEAN, S., HUMPHRIS, D. & MACLEOD-CLARK, J. 2006. Developing common learning: the new generation project undergraduate curriculum model. *Journal of Interprofessional Care*, 20, 12-28.
- O'LEARY, K. J., SEHGAL, N. L., TERRELL, G. & WILLIAMS, M. V. 2012. Interdisciplinary teamwork in hospitals: A review and practical recommendations for improvement. *Journal of Hospital Medicine*, 7, 48-54.
- O'REILLY, M. & PARKER, N. 2013. 'Unsatisfactory Saturation': a critical exploration of the notion of saturated sample sizes in qualitative research. *Qualitative research*, 13, 190-197.
- ORNE, M. T. 1962. On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American psychologist*, 17, 776.
- PAICE, E., HEARD, S. & MOSS, F. 2002a. How important are role models in making good doctors? *BMJ : British Medical Journal*, 325, 707-710.
- PAICE, E., MOSS, F., HEARD, S., WINDER, B. & MCMANUS, I. 2002b. The relationship between pre - registration house officers and their consultants. *Medical education*, 36, 26-34.
- PARSELL, G. & BLIGH, J. 1998. Interprofessional learning. *Postgraduate Medical Journal*, 74, 89-95.
- PARSELL, G. & BLIGH, J. 1999. The development of a questionnaire to assess the readiness of health care students for interprofessional learning (RIPLS). *Medical education*, 33, 95-100.
- PATTON, M. Q. 1990. *Qualitative evaluation and research methods*, Sage Publications.

## Bibliography

- PAWSON, R., GREENHALGH, T., HARVEY, G. & WALSHE, K. 2005. Realist review-a new method of systematic review designed for complex policy interventions. *Journal of health services research & policy*, 10, 21-34.
- PHARMACEUTICAL SERVICES NEGOTIATING COMMITTEE. 2018. *Summary Care Record (SCR)* [Online]. Available: <https://psnc.org.uk/contract-it/pharmacy-it/electronic-health-records/summary-care-record-scr-home/> [Accessed 2018].
- POLLARD, K. C. & MIERS, M. E. 2008. From students to professionals: Results of a longitudinal study of attitudes to pre-qualifying collaborative learning and working in health and social care in the United Kingdom. *Journal of Interprofessional Care*, 22, 399-416.
- POLLARD, K. C., MIERS, M. E. & RICKABY, C. 2012. "Oh why didn't I take more notice?" Professionals' views and perceptions of pre-qualifying preparation for interprofessional working in practice. *Journal of Interprofessional Care*, 26, 355-361.
- POPE, C., ZIEBLAND, S. & MAYS, N. 2000. Qualitative research in health care: analysing qualitative data. *BMJ: British Medical Journal*, 320, 114.
- PRIMARY CARE WORKFORCE COMMISSION 2015. The future of primary care: creating teams for tomorrow. London.
- PULLON, S. 2008. Competence, respect and trust: Key features of successful interprofessional nurse-doctor relationships. *Journal of Interprofessional Care*, 22, 133-147.
- QUANTRILL, S. & WEBBE, D. 2011. Including pharmacists on consultant-led ward rounds. *Clinical Medicine*, 11, 627-628.
- RAY, M. D. 1998. Shared borders: achieving the goals of interdisciplinary patient care. *American Journal of Health-System Pharmacy*, 55, 1369-1374.
- REESE, D. J. & SONTAG, M.-A. 2001. Successful interprofessional collaboration on the hospice team. *Health & Social Work*, 26, 167-175.
- REEVES, S. 2012. The rise and rise of interprofessional competence. *Journal of Interprofessional Care*, 26, 253-255.
- REEVES, S. & BARR, H. 2016. Twelve steps to evaluating interprofessional education. *Journal of Taibah University Medical Sciences*, 11, 601-605.
- REEVES, S., FLETCHER, S., BARR, H., BIRCH, I., BOET, S., DAVIES, N., MCFADYEN, A., RIVERA, J. & KITTO, S. 2016. A BEME systematic review of the effects of interprofessional education: BEME Guide No. 39. *Medical teacher*, 38, 656-668.
- REEVES, S. & FREETH, D. 2002. The London training ward: an innovative interprofessional learning initiative. *Journal of Interprofessional Care*, 16, 41-52.
- REEVES, S., FREETH, D., MCCRORIE, P. & PERRY, D. 2002. It teaches you what to expect in future...': interprofessional learning on a training ward for medical, nursing, occupational therapy and physiotherapy students. *Medical Education*, 36, 337-344.
- REEVES, S. & HEAN, S. 2013. Editorial: Why we need theory to help us better understand the nature of interprofessional education, practice and care. *Journal of Interprofessional Care*, 1-3.
- REEVES, S., LEWIN, S., ESPIN, S. & ZWARENSTEIN, M. 2010a. Glossary. *Interprofessional teamwork for health and social care*. London, UK: Blackwell-Wiley.
- REEVES, S., LEWIN, S., ESPIN, S. & ZWARENSTEIN, M. 2010b. Interprofessional Teamwork: Key Concepts and Issues. *Interprofessional Teamwork for Health and Social Care*. London, UK: Blackwell-Wiley.
- REEVES, S., PELONE, F., HARRISON, R., GOLDMAN, J. & ZWARENSTEIN, M. 2017. Interprofessional collaboration to improve professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*.
- REEVES, S., PERRIER, L., GOLDMAN, J., FREETH, D. & ZWARENSTEIN, M. 2013. Interprofessional education: effects on professional practice and healthcare outcomes (update). *Cochrane Database of Systematic Reviews*, 3.
- REEVES, S., TASSONE, M., PARKER, K., WAGNER, S. J. & SIMMONS, B. 2012. Interprofessional education: An overview of key developments in the past three decades. *Work: A Journal of Prevention, Assessment and Rehabilitation*, 41, 233-245.
- REEVES, S. & VAN SCHAIK, S. 2012. Simulation: A Panacea for interprofessional learning? *Journal of Interprofessional Care*, 26, 167-169.
- REEVES, S., ZWARENSTEIN, M., GOLDMAN, J., BARR, H., FREETH, D., KOPPEL, I. & HAMMICK, M. 2010c. The effectiveness of interprofessional education: Key findings from a new systematic review. *Journal of Interprofessional Care*, 24, 230-241.
- REID, R., BRUCE, D., ALLSTAFF, K. & MCLERNON, D. 2006. Validating the Readiness for Interprofessional Learning Scale (RIPLS) in the postgraduate context: are health care professionals ready for IPL? *Medical education*, 40, 415-422.

- RICE, K., ZWARENSTEIN, M., CONN, L. G., KENASZCHUK, C., RUSSELL, A. & REEVES, S. 2010. An intervention to improve interprofessional collaboration and communications: A comparative qualitative study. *Journal of Interprofessional Care*, 24, 350-361.
- RICHMOND, S., MORTON, V., CROSS, B., WONG, I. C. K., RUSSELL, I., PHILIPS, Z., MILES, J., HILTON, A., HILL, G. & FARRIN, A. 2010. Effectiveness of shared pharmaceutical care for older patients: RESPECT trial findings. *British Journal of General Practice*, 60, e10-e19.
- RIESEN, E., MORLEY, M., CLENDINNENG, D., OGILVIE, S. & ANN MURRAY, M. 2012. Improving interprofessional competence in undergraduate students using a novel blended learning approach. *Journal of Interprofessional Care*, 26, 312-318.
- RIFFENBURGH, R. 2012. *Statistics in Medicine*, Elsevier.
- RISSER, D. T., RICE, M. M., SALISBURY, M. L., SIMON, R., JAY, G. D. & BERNS, S. D. 1999. The potential for improved teamwork to reduce medical errors in the emergency department. *Annals of emergency medicine*, 34, 373-383.
- ROBERTSON, J. & BANDALI, K. 2008. Bridging the gap: Enhancing interprofessional education using simulation. *Journal of Interprofessional Care*, 22, 499-508.
- RODGER, S. & HOFFMAN, S. 2010. Where in the world is interprofessional education? A global environmental scan. *Journal of Interprofessional Care*, 24, 479-491.
- RODGERS, K. L. 2007. Using the SBAR communication technique to improve nurse-physician phone communication: a pilot study. *AAACN Viewpoint*, 29, 7.
- ROSENFELD, D., OANDASAN, I. & REEVES, S. 2011. Perceptions versus reality: a qualitative study of students' expectations and experiences of interprofessional education. *Medical education*, 45, 471-477.
- ROSENTHAL, M., AUSTIN, Z. & TSUYUKI, R. T. 2010a. Are pharmacists the ultimate barrier to pharmacy practice change? *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada*, 143, 37-42.
- ROSENTHAL, M., MAKOWSKY, M. J., TSUYUKI, R. T. & MADILL, H. M. 2010b. Patient's perspectives on team-based care by a clinical pharmacist: case report. *The Canadian journal of hospital pharmacy*, 63, 38.
- ROTZ, M. E., DUEÑAS, G. G., GROVER, A. B., HEADLY, A. & PARVANTA, C. F. 2015. Exploring first-year pharmacy and medical students' experiences during a longitudinal interprofessional education program. *Currents in Pharmacy Teaching and Learning*, 7, 302-311.
- ROUGHEAD, E. E., BARRATT, J. D., RAMSAY, E., PRATT, N., RYAN, P., PECK, R., KILLER, G. & GILBERT, A. L. 2009. The Effectiveness of Collaborative Medicine Reviews in Delaying Time to Next Hospitalization for Patients With Heart Failure in the Practice Setting. *CLINICAL PERSPECTIVE: Results of a Cohort Study. Circulation: Heart Failure*, 2, 424-428.
- ROUGHEAD, E. E., BARRATT, J. D., RAMSAY, E., PRATT, N., RYAN, P., PECK, R., KILLER, G. & GILBERT, A. L. 2011. Collaborative home medicines review delays time to next hospitalization for warfarin associated bleeding in Australian war veterans. *Journal of clinical pharmacy and therapeutics*, 36, 27-32.
- ROYAL COLLEGE OF GENERAL PRACTITIONERS 2014. An inquiry into patient centred care in the 21st Century. London: Royal College of General Practitioners.
- ROYAL PHARMACEUTICAL SOCIETY 2015. Transforming the Pharmacy Workforce in Great Britain: The RPS Vision. London: Royal Pharmaceutical Society.
- ROYAL PHARMACEUTICAL SOCIETY 2016. The Right Medicine: Improving Care in Care Homes. London: Royal Pharmaceutical Society.
- ROYAL PHARMACEUTICAL SOCIETY 2017a. *Medicines, Ethics and Practice*, London, Pharmaceutical Press.
- ROYAL PHARMACEUTICAL SOCIETY 2017b. Pharmacy Workforce Summit Report: right place, right time, right number – positioning the workforce for patients. London: Royal Pharmaceutical Society.
- ROYAL PHARMACEUTICAL SOCIETY 2017c. Professional standards for hospital pharmacy services: an updated draft for consultation July 2017. London: Royal Pharmaceutical Society.
- ROYAL PHARMACEUTICAL SOCIETY AND ROYAL COLLEGE OF GENERAL PRACTITIONERS 2011. Joint Statement - Breaking down the barriers – how community pharmacists and GPs can work together to improve patient care London: Royal Pharmaceutical Society and Royal College of General Practitioners.
- ROYAL PHARMACEUTICAL SOCIETY WALES 2015. Models of Care for Pharmacy within Primary Care Clusters. Cardiff: Royal Pharmaceutical Society.

## Bibliography

- SALAS, E., DIAZGRANADOS, D., KLEIN, C., BURKE, C. S., STAGL, K. C., GOODWIN, G. F. & HALPIN, S. M. 2008. Does team training improve team performance? A meta-analysis. *Human factors*, 50, 903-933.
- SANTSCHI, V., CHIOLERO, A., COLOSIMO, A. L., PLATT, R. W., TAFFÉ, P., BURNIER, M., BURNAND, B. & PARADIS, G. 2014. Improving blood pressure control through pharmacist interventions: a meta-analysis of randomized controlled trials. *Journal of the American Heart Association*, 3, e000718.
- SCHINDEL, T. J., YUKSEL, N., BREAUULT, R., DANIELS, J., VARNHAGEN, S. & HUGHES, C. A. 2017. Perceptions of pharmacists' roles in the era of expanding scopes of practice. *Research in Social and Administrative Pharmacy*, 13, 148-161.
- SCHMIDT, I., B. CLAESSON, C., WESTERHOLM, B., NILSSON, L. G. & SVARSTAD, B. L. 1998. The impact of regular multidisciplinary team interventions on psychotropic prescribing in Swedish nursing homes. *Journal of the American Geriatrics Society*, 46, 77-82.
- SELLORS, J., KACZOROWSKI, J., SELLORS, C., DOLOVICH, L., WOODWARD, C., WILLAN, A., GOEREE, R., COSBY, R., TRIM, K. & SEBALDT, R. 2003. A randomized controlled trial of a pharmacist consultation program for family physicians and their elderly patients. *Canadian Medical Association Journal*, 169, 17-22.
- SEXTON, J. B., THOMAS, E. J. & HELMREICH, R. L. 2000. Error, stress, and teamwork in medicine and aviation: cross sectional surveys. *BMJ: British Medical Journal*, 320, 745-749.
- SHOJANIA, K. G., DUNCAN, B. W., MCDONALD, K. M., WACHTER, R. M. & MARKOWITZ, A. 2001. Making health care safer: a critical analysis of patient safety practices. *Evid Rep Technol Assess (Summ)*, 43, 668.
- SIMMONS, B., EGAN-LEE, E., WAGNER, S. J., ESDAILE, M., BAKER, L. & REEVES, S. 2011. Assessment of interprofessional learning: the design of an interprofessional objective structured clinical examination (iOSCE) approach. *Journal of interprofessional care*, 25, 73-74.
- SIMMONS, B. & WAGNER, S. 2009. Assessment of continuing interprofessional education: Lessons learned. *Journal of Continuing Education in the Health Professions*, 29, 168-171.
- SMITH, F. 1998. Health services research methods in pharmacy: Qualitative interviews. *International Journal of Pharmacy Practice*, 6, 97-108.
- SMITH, J., PICTON, C. & DAYAN, M. 2013. Now or Never: Shaping Pharmacy for the Future. The Report of the Commission on future models of care delivered through pharmacy. *Royal Pharmaceutical Society, London*.
- SNELGROVE, S. & HUGHES, D. 2000. Interprofessional relations between doctors and nurses: perspectives from South Wales. *Journal of Advanced Nursing*, 31, 661-667.
- SNYDER, M. E., ZILLICH, A. J., PRIMACK, B. A., RICE, K. R., MCGIVNEY, M. A. S., PRINGLE, J. L. & SMITH, R. B. 2010. Exploring successful community pharmacist-physician collaborative working relationships using mixed methods. *Research in social and administrative pharmacy*, 6, 307-323.
- STEVEN, K., HOWDEN, S., MIRES, G., ROWE, I., LAFFERTY, N., ARNOLD, A. & STRATH, A. 2017. Toward interprofessional learning and education: Mapping common outcomes for prequalifying healthcare professional programs in the United Kingdom. *Medical Teacher*, 39, 720-744.
- STEVENS, S. S. 1946. On the theory of scales of measurement.
- STRASSER, D. C., FALCONER, J. A., STEVENS, A. B., UOMOTO, J. M., HERRIN, J., BOWEN, S. E. & BURRIDGE, A. B. 2008. Team training and stroke rehabilitation outcomes: a cluster randomized trial. *Archives of physical medicine and rehabilitation*, 89, 10-15.
- SUTER, E., ARNDT, J., ARTHUR, N., PARBOOSINGH, J., TAYLOR, E. & DEUTSCHLANDER, S. 2009. Role understanding and effective communication as core competencies for collaborative practice. *Journal of Interprofessional Care*, 23, 41-51.
- SWINGLEHURST, D., GREENHALGH, T., RUSSELL, J. & MYALL, M. 2011. Receptionist input to quality and safety in repeat prescribing in UK general practice: ethnographic case study. *BMJ: British Medical Journal*, 343.
- TASHAKKORI, A. & TEDDLIE, C. 2010. Overview of contemporary issues in mixed methods research. *Sage handbook of mixed methods in social & behavioral research*. USA: Sage Publications.
- TAVAKOL, M. & DENNICK, R. 2011. Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55.
- TAYLOR, D., YUEN, S., HUNT, L. & EMOND, A. 2012. An interprofessional pediatric prescribing workshop. *American journal of pharmaceutical education*, 76.
- TEDDLIE, C. & YU, F. 2007. Mixed methods sampling: A typology with examples. *Journal of mixed methods research*, 1, 77-100.

- THISTLETHWAITE, J. 2012. Interprofessional education: a review of context, learning and the research agenda. *Medical Education*, 46, 58-70.
- THISTLETHWAITE, J. & MORAN, M. 2010. Learning outcomes for interprofessional education (IPE): Literature review and synthesis. *Journal of interprofessional care*, 24, 503-513.
- THOMPSON, C., KINMONTH, A., STEVENS, L., PEVELE, R., STEVENS, A., OSTLER, K., PICKERING, R., BAKER, N., HENSON, A. & PREECE, J. 2000a. Effects of a clinical-practice guideline and practice-based education on detection and outcome of depression in primary care: Hampshire Depression Project randomised controlled trial. *The Lancet*, 355, 185-191.
- THOMPSON, R. S., RIVARA, F. P., THOMPSON, D. C., BARLOW, W. E., SUGG, N. K., MAIURO, R. D. & RUBANOWICE, D. M. 2000b. Identification and management of domestic violence: A randomized trial. *American journal of preventive medicine*, 19, 253-263.
- TODD, A., COPELAND, A., HUSBAND, A., KASIM, A. & BAMBRA, C. 2015. Access all areas? An area-level analysis of accessibility to general practice and community pharmacy services in England by urbanity and social deprivation. *BMJ: British Medical Journal Open*, 5.
- TSUYUKI, R. T., AL HAMARNEH, Y. N., JONES, C. A. & HEMMELGARN, B. R. 2016. The Effectiveness of Pharmacist Interventions on Cardiovascular Risk: The Multicenter Randomized Controlled Rx EACH Trial. *Journal of the American College of Cardiology*, 67, 2846-2854.
- TSUYUKI, R. T., JOHNSON, J. A., TEO, K. K., SIMPSON, S. H., ACKMAN, M. L., BIGGS, R. S., CAVE, A., CHANG, W.-C., DZAVIK, V. & FARRIS, K. B. 2002. A randomized trial of the effect of community pharmacist intervention on cholesterol risk management: the Study of Cardiovascular Risk Intervention by Pharmacists (SCRIP). *Archives of internal medicine*, 162, 1149-1155.
- TUNSTALL-PEDOE, S., RINK, E. & HILTON, S. 2003. Student attitudes to undergraduate interprofessional education. *Journal of Interprofessional Care*, 17, 162-172.
- TURNER III, D. W. 2010. Qualitative interview design: A practical guide for novice investigators. *The qualitative report*, 15, 754.
- VAN, C., MITCHELL, B. & KRASS, I. 2011. General practitioner-pharmacist interactions in professional pharmacy services. *Journal of Interprofessional Care*, 25, 366-372.
- VAN SOEREN, M., DEVLIN-COP, S., MACMILLAN, K., BAKER, L., EGAN-LEE, E. & REEVES, S. 2011. Simulated interprofessional education: An analysis of teaching and learning processes. *Journal of interprofessional care*, 25, 434-440.
- VINCENT, C., BATALDEN, P. & DAVIDOFF, F. 2011. Multidisciplinary centres for safety and quality improvement: learning from climate change science. *BMJ Quality & Safety*, 20, i73-i78.
- VOGLER, C., ARNOLDI, J., MOOSE, H. & HINGLE, S. T. 2017. Interprofessional education involving medical and pharmacy students during transitions of care. *Journal of Interprofessional Care*, 31, 404-406.
- VYGOTSKY, L. 1978. Interaction between learning and development. *Readings on the development of children*, 23, 34-41.
- WAKEFIELD, A., COOKE, S. & BOGGIS, C. 2003. Learning together: use of simulated patients with nursing and medical students for breaking bad news. *International journal of palliative nursing*, 9, 32-38.
- WALSHE, K. 2003. Foundation hospitals: a new direction for NHS reform? *Journal of the Royal Society of Medicine*, 96, 106-110.
- WELSH ASSEMBLY GOVERNMENT 2011a. Sustainable social services for Wales: A framework for action Cardiff: Welsh Assembly Government.
- WELSH ASSEMBLY GOVERNMENT 2011b. Together for Health: A Five Year Vision for the NHS in Wales. Cardiff: Welsh Assembly Government.
- WELSH ASSEMBLY GOVERNMENT 2015. A Planned Primary Care Workforce for Wales; Approach and development actions to be taken in support of the plan for a primary care service in Wales up to 2018. Cardiff: Welsh Assembly Government.
- WELSH ASSEMBLY GOVERNMENT 2017a. Community pharmacy services in Wales, 2016-17. Cardiff: Welsh Assembly Government.
- WELSH ASSEMBLY GOVERNMENT 2017b. GPs in Wales, 2006 - 2016. Cardiff: Welsh Assembly Government.
- WHILE, A., SHAH, R. & NATHAN, A. 2005. Interdisciplinary working between community pharmacists and community nurses: the views of community pharmacists. *Journal of Interprofessional Care*, 19, 164-170.
- WILD, D., NAWAZ, H., CHAN, W. & KATZ, D. L. 2004. Effects of interdisciplinary rounds on length of stay in a telemetry unit. *Journal of Public Health Management and Practice*, 10, 63-69.

## Bibliography

- WILES, R., CROW, G., HEATH, S. & CHARLES, V. 2008. The management of confidentiality and anonymity in social research. *International Journal of Social Research Methodology*, 11, 417-428.
- WILHELMSSON, M., PELLING, S., LUDVIGSSON, J., HAMMAR, M., DAHLGREN, L.-O. & FARESJÖ, T. 2009. Twenty years experiences of interprofessional education in Linköping – ground-breaking and sustainable. *Journal of Interprofessional Care*, 23, 121-133.
- WILSON, A. J., PALMER, L., LEVETT-JONES, T., GILLIGAN, C. & OUTRAM, S. 2016. Interprofessional collaborative practice for medication safety: Nursing, pharmacy, and medical graduates' experiences and perspectives. *Journal of Interprofessional Care*, 30, 649-654.
- WILSON, H. & BARBER, N. 2013. Review of NHS pharmaceutical care of patients in the community in Scotland. Scottish Government Edinburgh.
- WILSON, S., MARKS, R., COLLINS, N., WARNER, B. & FRICK, L. 2004. Benefits of multidisciplinary case conferencing using audiovisual compared with telephone communication: a randomized controlled trial. *Journal of telemedicine and telecare*, 10, 351-354.
- WOOLLARD, M. 2006. The role of the paramedic practitioner in the UK. *Australasian Journal of Paramedicine*, 4.
- WORLD HEALTH ORGANISATION 2010. Framework for action on interprofessional education and collaborative practice. Geneva: World Health Organisation.
- WORLD HEALTH ORGANISATION 2013. Transforming and scaling up health professionals' education and training. Geneva: World Health Organisation.
- XYRICHIS, A. & LOWTON, K. 2008. What fosters or prevents interprofessional teamworking in primary and community care? A literature review. *International journal of nursing studies*, 45, 140-153.
- YOUNG, A. S., CHINMAN, M., FORQUER, S. L., KNIGHT, E. L., VOGEL, H., MILLER, A., ROWE, M. & MINTZ, J. 2005. Use of a consumer-led intervention to improve provider competencies. *Psychiatric Services*, 56, 967-975.
- ZWARENSTEIN, M., ATKINS, J., BARR, H., HAMMICK, M., KOPPEL, I. & REEVES, S. 1999. A systematic review of interprofessional education. *Journal of Interprofessional Care*, 13, 417-424.
- ZWARENSTEIN, M., REEVES, S. & PERRIER, L. 2005. Effectiveness of pre-licensure interprofessional education and post-licensure collaborative interventions. *Journal of Interprofessional Care*, 19, 148-165.

## **Appendices**

## Appendix A – Methods for literature searching

The aims of literature searching throughout this thesis were to identify and describe existing literature concerning collaboration and interprofessional working relationships between pharmacists and other healthcare professionals to identify themes in the current literature and areas which are under addressed. In addition, further evaluation was done to determine methods used which aim to improve interprofessional working, with a particular focus on interprofessional education.

A systematic approach was taken to searching and identifying the literature, however, due to the heterogeneity of the literature in the area, this approach also needed to be iterative and flexible. The approach taken draws on some of the principles of 'realist review' (Pawson et al., 2005) which include:

1. Being flexible and iterative in approach and strategy, with refinement throughout the process
2. The use of snowballing to identify further literature – pursuing references of references – as well as conventional database searches with keywords
3. Appraising the quality of the studies, but with recognition that this cannot be standardised due to the disparate nature of the literature. Instead each study is assessed for 'fitness for purpose', relevance and rigour (Barbour and Barbour, 2003)
4. Data extraction takes the form of information assimilation through note-taking rather than the use of a standardised data extraction form

A list of keywords was produced based on prior knowledge of and reading in the subject area. The thesaurus function in OVID was also utilised across the various databases to identify any further keyword terms. When determining the interprofessional working between pharmacists and HCPs and the interprofessional education used the following keywords were entered: interprofessional OR multiprofessional OR multidisciplinary OR interdisciplinary OR inter-professional OR multi-professional. These were combined with pharmac\$ and then also collaborat\$ OR cooperat\$ OR teamwork\$ OR integrat\$ OR partnership\$ OR relationship\$ OR network\$ OR interaction, when determining pharmacists' interprofessional relationships, and combined with education OR learning when exploring educational methods.

All keywords were searched in the abstract, title, keyword and subject heading search fields. The following databases were searched: EMBASE, MEDLINE, Scopus, Science Direct, International Pharmaceutical Abstracts, British Nursing Index and PyschINFO and Health Management Information Consortium (HMIC). These searches were limited to the English language only.

The following inclusion criteria were applied when exploring pharmacist-HCP interprofessional working in practice and thus papers not covering at least one of these areas were excluded from the review:

- Pharmacist or HCP views on collaboration or working relations
- The nature or type of collaboration or interaction between the two professions

- The extent or measure of collaboration or interaction between the two professions
- The process of pharmacist-HCP collaboration (including barriers, facilitators and strategies)
- The outcomes of pharmacist-HCP collaboration

Although the PhD did not aim to measure clinical outcomes of collaboration, it was felt that the literature in the area should also be included to provide background and a more complete picture of the overall collaboration process.

In addition, the following inclusion criteria were applied when exploring pharmacist based interprofessional education and thus papers not covering at least one of these areas were excluded from the review:

- Pharmacist or HCP (including student) views on interprofessional education sessions
- The nature or type of interprofessional education session between pharmacists and other HCPs, including descriptive terms around the session
- Analysis of the IPE sessions or the outcomes achieved/aimed to be achieved
- The benefits, facilitators and barriers to conducting IPE

Data extraction was conducted inductively and took the form of information assimilation through note-taking. Following the 'realist review' approach, which enables flexibility in approach and strategy, the researcher drew on existing knowledge and experience of the literature area, in order to verify the search strategy and the results produced. A standardised data extraction form was not employed, due to heterogeneity of the studies.

This method was augmented with manual searching of references in the reviewed articles and additional searching on government, department of health and professional governing body websites to determine key policy documents in the area.

**Appendix B – Ethical approval**

**Ethical approval for chapter 3 – The landscape of IPE across schools of pharmacy**

This approval allowed an online questionnaire to explore this area.

SPPS Ethics Approval Notification (EAN)

8/9/14 v12

**Cardiff School of Pharmacy and Pharmaceutical Sciences,  
Research Ethics Approval**

This form has been signed by the School Research Ethics Officer as evidence that approval has been granted by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee for the following study:

Project title:	1415-51 What is the current landscape of interprofessional education within schools of pharmacy?
----------------	--

This is a/an:	Undergraduate project	<input type="checkbox"/>
	ERASMUS project	<input type="checkbox"/>
	Postgraduate project	<input checked="" type="checkbox"/>
	Staff project	<input type="checkbox"/>

Name of researcher: (PG/Staff projects only)	Andy Jenkins
Name of supervisor(s):	Louise Hughes, Mat Smith, Efi Mantzourani

**STATEMENT OF ETHICS APPROVAL**

**This project has been considered and has been approved by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee**

Signed  Name R Price-Davies Date 04 Sep 15  
(Chair, School Research Ethics Committee)

### Ethical approval for chapters 4, 5 and 6 – Who do pharmacists within Wales work with?

This approval allowed a mixed methods approach (both questionnaires and interviews) to be used explore this area.

SPPS Ethics Approval Notification (EAN)

8/9/14 v12

<b>Cardiff School of Pharmacy and Pharmaceutical Sciences, Research Ethics Approval</b>
---

This form has been signed by the School Research Ethics Officer as evidence that approval has been granted by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee for the following study:

Project title:	1415-32 Who do pharmacists within Wales work with?
----------------	--

This is a/an:	Undergraduate project	
	ERASMUS project	
	Postgraduate project	X
	Staff project	

Name of researcher: (PG/Staff projects only)	Andy Jenkins
Name of supervisor(s):	Louise Hughes, Mat Smith, Efi Mantzourani

<b>STATEMENT OF ETHICS APPROVAL</b>
-------------------------------------

**This project has been considered and has been approved by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee**

Signed  Name R Price-Davies Date 04 Sep 15  
(Chair, School Research Ethics Committee)

## Appendix C – Landscape of IPE information sheet

### What is the current landscape of interprofessional education within schools of pharmacy?

#### Participant Information Sheet

As an academic member of staff within a UK school of pharmacy you have been invited to take part in a short online questionnaire surrounding the topic of interprofessional education (IPE). Before taking part please read the following information about the study.

#### What is the purpose of the study?

The purpose of this study is to identify the current landscape of IPE across schools of pharmacy in the UK that, to our knowledge, is not currently available within the literature.

#### Why have I been contacted for this study?

You have been contacted, alongside academic colleagues from schools of pharmacy across the UK, as you have been identified by myself or my supervisors as someone who has an interest in IPE, or are involved in the development or delivery of IPE sessions. If there is another colleague within your University who would be more suitable to take part in this study please could you provide me with his/her contact details and I will contact them directly regarding their participation.

#### Who are the researchers?

The questionnaire has been produced by myself, Andy Jenkins, a second year PhD student, under the supervision of Dr Mat Smith, Dr Louise Hughes and Dr Efi Mantzourani. This study has been approved by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee.

#### How will the research take place?

If you consent you will be transferred to the questionnaire that should take no longer than 15 minutes of your time. Questions will be asked regarding the current practice of IPE within your school of pharmacy. All responses are confidential and anonymous. Participation in this study is entirely optional and you do not have to answer all questions if you do not wish.

You can participate by following the link below: <http://tinyurl.com/IPE-PharmSchoolQuestionnaire>

#### What are the potential benefits?

The results gained from each participating school will be collated and disseminated at the request of participants. This will provide each participant with valuable information about the landscape of IPE across the UK and Australia.

#### Do I have to take part?

*Participation in this study is entirely optional and you do not have to answer all questions if you do not wish. Any additional information you provide is welcome.*

#### Who can I contact for more information?

*For more information please contact myself Andy at [JenkinsAI1@cardiff.ac.uk](mailto:JenkinsAI1@cardiff.ac.uk). If further information is required the project supervisors can also be contacted; Dr Mat Smith ([SmtihMW1@cardiff.ac.uk](mailto:SmtihMW1@cardiff.ac.uk)), Dr Louise Hughes ([HughesML@cardiff.ac.uk](mailto:HughesML@cardiff.ac.uk)), Dr Efi Mantzourani ([MantzouraniE1@cardiff.ac.uk](mailto:MantzouraniE1@cardiff.ac.uk)). Please note that contacting the investigator does not commit you to participating.*

**Appendix D - Landscape of IPE questionnaire**

## What is the current landscape of interprofessional education?

As an academic member of staff within a school of pharmacy you have been invited to take part in this short, online questionnaire surrounding the topic of interprofessional education (IPE). Before taking part please read the following information about the study:

The purpose of this study is to identify the current landscape of IPE across schools of pharmacy in the UK and Australia which, to our knowledge, is not currently available within the literature.

If you consent below you will be transferred to the questionnaire which should take no longer than 10 minutes of your time. Questions will be asked regarding the current practice of IPE within your school of pharmacy. Here you can provide as much detail as you see fit regarding each session you conduct.

All responses are confidential and anonymous. Participation in this study is entirely optional and you do not have to answer all questions if you do not wish. Any additional information you provide is welcome.

The results gained from each participating school will be collated and disseminated at the request of participants.

By completing the questionnaire you are consenting for the information you provide to be used in any report or publication which may result from the data.

This study has been approved by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee and has been produced and will be analysed by a second year pharmacy practice PhD student, Andy Jenkins, under the supervision of Dr Mat Smith ([SmithMW1@cardiff.ac.uk](mailto:SmithMW1@cardiff.ac.uk)), Dr Louise Hughes ([HughesML@cardiff.ac.uk](mailto:HughesML@cardiff.ac.uk)) and Dr Efi Mantzourani ([MantzouraniE1@cardiff.ac.uk](mailto:MantzouraniE1@cardiff.ac.uk)).

For more information please contact Andy Jenkins ([JenkinsA11@cardiff.ac.uk](mailto:JenkinsA11@cardiff.ac.uk)), or a supervisor listed above. Please note that contacting the investigator does not commit you to participating.

**Having read the information above do you consent to completing the following questionnaire?**

- Yes  
 No

Continue »

# What is the current landscape of interprofessional education?

## Section A - Overview of your school's IPE

Below are some questions regarding the overall IPE program you provide within your school of pharmacy, and the role you have relating to these sessions.

Please complete as many of the questions as you can.

**Do you actively take part in conducting or developing IPE within your school of pharmacy?**

- Yes  
 No

**If 'yes' please briefly describe this role:**

**How many IPE sessions do you currently have in the undergraduate programme?**

**What year was IPE introduced into your school of pharmacy?**

**How many different professions do you work with across your IPE programme?**

**Do you have any sessions which have been developed but have not yet been undertaken?**

- Yes - due to start in 2015/16 academic year  
 Yes - unsure when the session will start  
 No

**Does your school have students enrolled in all years of the pharmacy programme?**

- Yes  
 No  
 Prefer not to answer

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Continue »

## Section B - Questions on each individual session

Within this section we would like to find out more information regarding each individual IPE session you undertake.

Please fill in a separate page for each individual IPE session your school delivered in the 2014/15 academic year only.

Questions for 'Session 1' can be found below.

### Session 1

**What is the 'title' of this session?**

**How long has this session been running in its current format?**

**Which year of the pharmacy programme is involved?**

More than one year can be entered if required

- Year 1
- Year 2
- Year 3
- Year 4
- Year 5

**Is it compulsory for all students within this year take part?**

- Yes
- No

**If 'No' what proportion of students take part?**

**In which semester is the session run?**

- Semester 1
- Semester 2

**Which other student professional(s) is the session conducted with, and what year are these students in?**

**Where is the session set?**

- Lecture theatre
- Workshop room
- Simulation suite
- Clinical setting (e.g. hospital)
- On placement
- Other:

**What is the topic of the session? (Please provide a brief summary of the tasks involved)**

**What are the key learning outcomes for this session?**

**Are the learning outcomes measured? (For example summative/formative assessments)**

- Yes
- No

**If 'Yes' please describe how the learning outcomes are measured:**

**Is the session evaluated? (For example using RIPLS or other student perception evaluations such as interviews)**

- Yes
- No

**If 'Yes' please describe how the session is evaluated:**

**Will this session run again in the coming academic year?**

- Yes with no changes
- Yes with changes
- No

**If 'Yes with changes' please briefly describe what changes will be made:**  
Please include any changes to assessment or evaluation techniques

**If 'No' please briefly describe why this session will no longer be run:**

**Do you have any other comments to make regarding this session?**

**Do you undertake any other IPE sessions within your University?**

- Yes
- No

## Section C - New sessions for 2015/16

This short section aims to determine if your University plans to start any new IPE within the coming 2015/16 academic year.

If so please briefly describe the session below, including any available information such as participating professions and years, topic areas, student assessments and evaluations, location of sessions and when in the curriculum this session will be delivered.

**Please describe the new IPE sessions below:**  
More than one session can be included within this box.

## Any other comments?

Thank you for taking your time to fill in the questionnaire. I'd appreciate any other comments you may have, whether that be regarding interprofessional education within your University, as a wider concept, or on the research being conducted.

**If you have any other comments please use the box below**

**If you are happy to be contacted about any answers given, or would like to be provided with the results of this study directly please provide your contact details below:**

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Continue »

## Thank you for completing the questionnaire

If you would like any further information regarding the questionnaire or any other matters please feel to contact myself, Andy Jenkins, at [JenkinsA11@cardiff.ac.uk](mailto:JenkinsA11@cardiff.ac.uk) or my supervisors Dr Mat Smith ([SmithMW1@cardiff.ac.uk](mailto:SmithMW1@cardiff.ac.uk)), Dr Louise Hughes ([HughesML@cardiff.ac.uk](mailto:HughesML@cardiff.ac.uk)) and Dr Efi Mantzourani ([MantzouraniE1@cardiff.ac.uk](mailto:MantzouraniE1@cardiff.ac.uk)) and we will be happy to answer any questions you may have.

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Submit

*Never submit passwords through Google Forms.*

## Appendix E – Community questionnaire

The aim of the study is to investigate the day-to-day interaction between pharmacists and members of the healthcare team. By completing the questionnaire you will be helping teaching staff in the School of Pharmacy and Pharmaceutical Sciences at Cardiff University to gain valuable information. This will help to inform the School's future undergraduate and postgraduate education provision.

The questions relate to your individual experiences in **this pharmacy** specifically. We are trying to capture what is happening on a regular basis in the pharmacy environment; therefore, if you work within this pharmacy **less than 2 days a week**, we would be grateful if you could pass this questionnaire to the regular pharmacist to complete.

This questionnaire should take **no longer than 5 minutes** to complete. Please remember that all replies are **completely confidential** and a **freepost envelope** is provided to return your questionnaire.

### Section A – About you and this pharmacy

We would like to obtain some background information that will assist us in contextualising your answers. For this section, please answer related to the pharmacy you are working at today (*referred to as "this" pharmacy in the questions*). Please tick **one answer** for each of the following questions (*unless stated otherwise*):

**A1)** Which health board is **this** pharmacy associated with?

Abertawe Bro Morgannwg     Aneurin Bevan     Betsi Cadwaladr   
Cardiff & Vale     Cwm Taf     Hywel Dda     Powys

**A2)** How would you describe the location of **this** pharmacy?

City/Town high street     City/Town residential suburbs   
Out-of-town supermarket     Out-of-town retail park   
Rural/Village     Other  (*Please state*) \_\_\_\_\_

**A3)** How would you describe your position in **this** pharmacy?

Locum     Manager     Regular pharmacist     Owner   
Relief pharmacist     Other  (*Please state*) \_\_\_\_\_

**A4)** How many branches does **this** pharmacy business have?

1     2-3     4-6     7-9     More than 10

**A5)** Is **this** pharmacy directly attached to the following healthcare providers? (*Please tick more than one if necessary*)

GP surgery     Opticians     Dentists   
Other  (*Please State*) \_\_\_\_\_

**A6)** How many GP surgeries does **this** pharmacy regularly work with in a typical week?

1     2-5     6-8     More than 8

**A7)** How many staff work within **this** pharmacy's dispensary daily (*excluding yourself*):

0     1     2     3     4     5   
More than 5

**A8)** Which of the following services do you typically provide when working in **this** pharmacy? (*Please tick more than one if necessary*)

Medicines Use Review (MUR)  Discharge Medicines Review (DMR)   
 Common Ailment Scheme   
 Other advanced/enhanced services  (*please state*)

**Section B -Members of the healthcare team**

In this section we are collecting information about members of the healthcare team with whom you could be interacting, as part of your professional life. Please tick a box for **each line** of the table, which best describes the amount of direct personal interaction (either face to face, by phone or by email) you have with that healthcare team member.

If a healthcare team member is not listed here, please fill in the 'other' section and state the frequency of the interaction.

Member of healthcare team	At least once a DAY	At least once a WEEK	At least once a MONTH	At least once a YEAR	Less frequently	Never
Accredited checking technician (ACT)						
Care home staff						
Dentist						
Dietician						
Dispenser/Technician						
Doctor - Hospital						
General practitioner (GP)						
GP receptionist						
GP practice manager						
Health visitor						
Medicines counter/ Healthcare assistant						
Midwife						
Nurse - Community						
Nurse - Hospital						
Occupational therapist						
Optician						
Paramedic						
Pharmacist - Hospital						
Pharmacist - Primary care						
Physiotherapist						
Podiatrist						
Pre-registration Pharmacist						
Radiographer						
Social worker						
Speech and language therapist						
Vet						
Other (please list below)						

**If you have any additional comments you would like to make relating to which healthcare colleagues you work with please fill in the box below.**

**Thank you very much for your time in completing this questionnaire.**

Please use the **freepost** envelope provided to submit your response to Andy Jenkins at:

*Pharmacy Education and Practice, Cardiff School of Pharmacy and Pharmaceutical Sciences, Redwood Building, King Edward VII Avenue, Cardiff, CF10 3NB*

**Appendix F – Community questionnaire cover letter****Who do pharmacists work with?**

Dear Pharmacist,

I would like to invite you to take part in a study that aims to investigate the day-to-day interaction between pharmacists and members of the healthcare team.

Pharmacists working in all community pharmacies throughout Wales are being invited to take part and instructions on completing the study are detailed within the questionnaire.

The questionnaire is voluntary, however, I would greatly appreciate it if you could take **no longer than 5 minutes** out of your time to share your views with me.

The questions relate to your individual experiences in **this pharmacy** specifically. If you work within this pharmacy **less than 2 days a week**, please pass onto another pharmacist to complete.

By completing the questionnaire you will be helping teaching staff in the School of Pharmacy and Pharmaceutical Sciences at Cardiff University to gain valuable information. This will help to inform the School's future undergraduate and postgraduate education provision.

Your responses will be completely **confidential**. The code number specified on each questionnaire is to allow me to send reminders to those pharmacies who have not responded. Information identifying the respondent will not be disclosed under any circumstances.

If you have any questions or comments about this study, feel free to contact myself, or my supervisors, using the contact details provided.

Your responses will be of great importance to my research and I very much look forward to receiving your completed questionnaire, which can be returned using the **freepost** envelope enclosed by **20<sup>th</sup> February**.

**Thank you very much for your time in completing the questionnaire.**

Yours Sincerely,

Andy Jenkins

Tel: 02920870516

JenkinsAI1@cardiff.ac.uk

Dr Louise Hughes

Tel: 02920876432

HughesML@cardiff.ac.uk

Dr Mat Smith

Tel: 02920879286

SmithMW1@cardiff.ac.uk

Dr Efi Mantzourani

Tel: 02920870452

MantzouraniE1@cardiff.ac.uk

## Appendix G – Community interviews cover letter

### Who do pharmacists work with?

Dear Pharmacist,

As a practicing pharmacist in Wales you have been invited to take part in a study surrounding the interactions of pharmacists and other healthcare professionals in practice.

Attached is a further information leaflet; please take the time to read through the information before deciding whether or not you wish to participate.

This study is a follow up of a recent project sent to pharmacists across Wales that aimed to determine the frequency of interactions between pharmacists and healthcare professionals. In this study would now like to understand the nature of these interactions.

If you wish to take part please contact Lauren, Andy or one of the research team below and we will arrange a mutually convenient time and location to conduct a one-on-one audio-recorded interview. Your responses will be completely **confidential**.

By completing the questionnaire you will be helping teaching staff in the School of Pharmacy and Pharmaceutical Sciences at Cardiff University to gain valuable information. This will help to inform the School's future undergraduate and postgraduate education provision.

If you have any questions or comments about this study, feel free to contact myself, or my supervisors, using the contact details provided.

Your participation will be of great importance to my research and I very much look forward to receiving your response, which can be done through contacting any of the research team below.

**Thank you very much for your time, hope to hear from you soon.**

Yours Sincerely,

Lauren Akers  
AkersL@cardiff.ac.uk

Andy Jenkins  
Tel: 029225 10138  
JenkinsAI1@cardiff.ac.uk

Dr Mat Smith  
Tel: 029208 79286  
SmithMW1@cardiff.ac.uk

## Appendix H - Community interviews information sheet

### ***Who do Pharmacists work with? Participant Information Sheet***

As a practicing pharmacist in Wales you have been invited to take part in a study surrounding the interactions of pharmacists and other healthcare professionals in practice. Please take the time to read through the information before deciding whether or not you wish to participate.

#### **What is the purpose of the study?**

This study is a follow up of a recent survey sent to pharmacists across Wales that aimed to determine the frequency of interactions between pharmacists and healthcare professionals. In this study would now like to understand the nature of these interactions.

#### **Who are the researchers?**

This study is to be undertaken by a final year MPharm student Lauren Akers under the supervision of Andy Jenkins, a final year PhD student. This study has been approved by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee.

#### **Why have I been invited to participate in this study?**

You have been invited to take part because you are a practicing pharmacist in Wales and are therefore knowledgeable on the interprofessional interactions that take place in practice

#### **How will the research take place?**

If you consent, you will be invited to take part in a one-to-one interview which will be audio-recorded. The interview will be conducted in private and will start by clarifying some initial demographic details, ie the health board you work in and your role within the pharmacy. The interview will then progress to determine your interactions with other healthcare professionals and the reasons behind these interactions. Please be aware that this interview is about your experiences in general and you will not be asked to divulge any patient/healthcare member specific information. The interview should last approximately ... minutes.

#### **Do I have to take part?**

The decision to consent lies entirely with you. If you wish to take part we will arrange a mutually convenient time and location. Please sign the two enclosed copies of the consent form and bring them along to the arranged interview. One copy of the form is for you to keep. The research team will retain the other copy. You are free to withdraw from the study at any time without giving a reason.

#### **How will the information collected be used?**

Confidentiality will be ensured at all stages of the research process. The transcripts will be anonymised and consent forms, transcripts, questionnaires and tapes will be kept securely in the School of Pharmacy & Pharmaceutical Sciences. Any information retained on university computers will contain a reference number in place of your personal data. Any personal details that are collected during the study will only be seen by the research team and will not be kept for any longer than is needed to complete this study. It is anticipated that this will be no longer than 12 months.

This research could help the School in understanding the relationships pharmacists have in practice which could help inform the undergraduate and postgraduate pharmacy programmes in the future.

#### **Who to contact to participate or for more information?**

If you are happy to take part in the study or would like further information please contact Lauren, Andy or any member of the research team via the details given below. Please note that contacting the investigator does not commit you to participating.

**Research Student:** Lauren Akers ([AkersL@cardiff.ac.uk](mailto:AkersL@cardiff.ac.uk))

**Cardiff University project supervisors:** Andy Jenkins ([JenkinsAI1@cardiff.ac.uk](mailto:JenkinsAI1@cardiff.ac.uk)), Dr Mat Smith ([SmtihMW1@cardiff.ac.uk](mailto:SmtihMW1@cardiff.ac.uk)), Dr Louise Hughes ([HughesML@cardiff.ac.uk](mailto:HughesML@cardiff.ac.uk)), Dr Efi Mantzourani ([MantzouraniE1@cardiff.ac.uk](mailto:MantzouraniE1@cardiff.ac.uk))

**Appendix I - Community interviews consent forms**

**Consent Form**

Please read the following statements and initial the boxes next to the statements for which you give consent.

Please also sign and date the form below.

1. *I confirm that I have read and understood the participant information sheet and have had the opportunity to ask any questions.*

2. *I understand that my participation is voluntary and I have the right to withdraw at anytime.*

3. *I understand that by signing the form I agree to give consent to participate within the study.*

4. *I give my consent for the interview to be audio-recorded.*

5. *I agree to be contacted by the researchers if clarification is needed regarding any points discussed during the interview.*

6. *I understand that verbatim quotes may be used in reports and if so, they will be anonymised.*

**Participant details**

**Name (please print):**

**Telephone Number:**

**Signature:**

**Email:**

**Date:**

**Name of Researcher:**

**Signature of Researcher:**

**Date:**

## Appendix J - Community interview schedule

**Aim: To explore the reasons behind interprofessional interactions that take place between pharmacists and healthcare professionals they frequently interact with.**

### **Main topics**

These are the main topics that the questions below are focused around, from these use prompts to gain further expanded information

Perception of interprofessional education and interactions

Who do they interact with and how often?

What are the interactions about, what was their purpose?

How were the interactions undertaken?

Barriers and facilitators to interactions

Perceived benefits of IP interaction

### **Intro**

*ENSURE TWO COPIES OF CONSENT FORMS ARE SIGNED – Make sure they are happy to be recorded from the consent form. Confirmation of anonymity and confidentiality.*

Personal introduction and explanation of the study. Explanation about interview.

*“I am going to start with some general questions relating to your career as a pharmacist then I will follow on with a card-sorting activity focusing on interprofessional interactions and finish with some short questions relating to your personal experiences with other healthcare professionals in **THIS** pharmacy. Please remember that these are your opinions, there are no right or wrong answers. The interview should take approximately 20 minutes in total, I may make some notes throughout but these are for my own benefit and please feel free to ask any questions if you need to. If you need to stop at any time to talk to a customer that is also fine I will pause and restart afterwards.”*

### **General questions**

Could you first of all tell me a bit about your background as a pharmacist?

a) Which university did you study at?

b) When did you qualify?

c) How long have you worked in this branch?

d) Do you work in any other pharmacies? (Reiterate that answers should be related to this pharmacy)

e) Have you always worked in community pharmacy?

### **Opening questions**

Could you explain what the term interprofessional interaction means to you?

What do you perceive as the benefits of interprofessional interactions to yourself and the patient?

### **Reflective card activity**

*‘Could you now sort in order those who you interact with the most frequently to the least? These healthcare professionals have been chosen from the previous study of which pharmacists interact with based on experiences in **THIS** pharmacy’*

*Is it okay for me to take a photo of this order for my data collection?*

*‘Hopefully that has started you to think about the various interactions which can occur within pharmacy. I’d like to look at a few of these in more detail.’*

**Questions related to card activity**

**GP**

I have noted that you have put **GP** as number ..... on your list; could you tell me a bit about a typical interaction with a GP?

What would you say are the main reasons for interactions with GPs?

How did this occur?

How frequently would you interact with a GP?

Any barriers?

Anything which could make these interactions easier?

Do these typical interactions benefit your learning?

Is there a particular example of a GP interaction that you can think of?

Could you elaborate on that? When/How etc.

Have you had any other interactions with any other types of doctors other than GPs?

Are these similar to the interactions you have already discussed?'

**COMMUNITY NURSE**

Another one of your interactions I would like to explore is with **Community Nurses**, could you tell me a bit about a typical interaction with this professional?

What would you say are the main reasons for interactions with a community nurse?

How did this happen?

How frequently would you interact with a community nurse?

Was there anything which makes these interactions more difficult?

Anything which could make these interactions easier?

Do these typical interactions benefit your learning?

Is there a particular example of a community nurse interaction that you can think of?

Could you elaborate on that?

Have you had any other interactions with any other types of nurses?

Are these similar to the interactions you have already discussed?'

Use similar prompts as questions above to find out more

**DENTIST**

The final healthcare professional I would like to ask about is a **Dentist**, could you tell me a bit about a typical interaction with this professional?

What would you say are the main reasons for interactions with a dentist?

How did this occur?

Are interactions with dentists a frequent?

Any barriers?

Anything which could make these interactions easier?

Do these typically benefit your learning?

Is there a particular example of a dentist interaction that you can think of?

Could you elaborate on that?

**If the participant ranks another healthcare professional in the card-sorting activity within their top three**, explore this more using the same questions and prompts as above.

**Final questions**

Do you have anything you want to add about any other healthcare professionals on this list that you may feel are important?

Have you had any previous training for interprofessional work? This could be at undergraduate level or from courses you have taken

What do you think would be a useful IPE session to add into the undergraduate course? They may not have done IPE before, so just say 'from what you know about IPE what do you think would be useful?

When was the last time you learnt something new from another HCP?

- a) What was it?
- b) Was it by chance or organised?
- c) How have you applied this learning?

In terms of quantity of your interactions with our professions, do you feel this is too much, too little or just right? – Can you explain why you think this?

- a) Would this increased interaction benefit you?
- b) Is there anything specific at the moment that you would like to learn from another?

If you could add in one IPE session into the undergraduate curriculum, what would it be? Could you explain why this is your choice?

### **GENERAL PROMPTS**

Can you give me another example of this?

Could you elaborate on that?

Is there anything else you would like to add onto this?

Could you expand a bit more on that?

Is that everything you would like to comment on this subject?

Could you explain that a bit further?

## Appendix K – Community questionnaire free text comments

Section C of the questionnaire comprised a free text comments box for respondents to add any further information they thought appropriate to the study. A total of 25 of the 443 respondents made comments which were transcribed and inductively analysed producing six main themes and associated subthemes as shown in **Table Appendix K.1**.

**Table Appendix K.1.** Themes/subthemes produced from free text qualitative responses through inductive, thematic analysis

Theme	Subtheme
1. Respondent's relationship with healthcare professionals	1.1. Respondent has a close relationship with HCP 1.2. Respondent doesn't have a close relationship with HCP
2. Perceived benefits to interprofessional interactions	2.1. Benefits to the patient 2.2. Benefits to the pharmacist and other HCPs
3. Perceived barriers to interprofessional interactions	3.1. HCPs have a lack of understanding of pharmacy role 3.2. There is a lack of respect for the pharmacy team 3.3. Time constraints 3.4. Approachability of HCPs 3.5. Not being within close proximity to HCPs 3.6. GP practices worry about having a close relationship with one pharmacy 3.7. Pharmacists don't network with other HCPs 3.8. Difficult to know which healthcare professional to contact
4. Perceived facilitators to interprofessional interactions	4.1. Being within close proximity to other HCPs 4.2. Utilising private consultation room for other HCPs 4.3. Providing collaborative service 4.4. Developing relationships in other pharmacy roles
5. Methods of improving interprofessional interactions	5.1. Participating in group meeting with GP practices 5.2. Having a way of emailing prescribers
6. Reasons for, and frequency of, respondents interactions with specific HCPs	See Appendix 5.2 for more detail

### 1. Participants relationships with HCPs

#### 1.1. Participant has a close relationship with HCP

A number of participants commented on how they had a close relationship with other HCPs (n=5), 'we have a very close and co-operative relationship with the community nursing teams' (P644), 'The cooperation is very satisfactory, I find them very helpful and open-minded.' 126. 'We work in a rural community and as part of an integrated healthcare team.' 267

#### 1.2. Participant doesn't have a close relationship with HCP

However, P224 believed that their interprofessional relationship with GPs has broken down somewhat, saying there is 'now less contact with new GPs, used to be a far closer relationship' and participant 178 made a general comment about their lack of interactions, 'hardly ever anyone else unless there are specific queries with Rx (eg vet and dentists)'.

### 2. Perceived benefits to interprofessional interactions

#### 2.1. Benefits to the patient

Some participants (n=3) commented on the benefits of interprofessional interactions, P679 believed that by offering 'a more holistic healthcare service' this 'improves patient outcomes', whereas P67 found that these relationships benefit everyone; 'I think (and find) that better relationships benefit everyone'. This was reiterated by P199 who stated that a 'very close working relationship with local surgery is essential for optimal healthcare provision and safety of patients'.

## **2.2. Benefits to the pharmacist and other HCPs**

P85 summarised these points, stating that *'when professionals work together it's amazing how much you can learn and benefit from each other so ultimately the customer/patient benefits which is surely what we aim for.'*

## **3. Perceived barriers to interprofessional interactions**

Eight different barriers to interprofessional interactions emerged from the comments left by participants. These have been listed below:

### **3.1. HCPs have a lack of understanding of pharmacy role**

This was summed up by P169; *'There is a lack of understanding within the wider primary healthcare team and hospital pharmacy of the role of community pharmacy and the legalities within which we operate. We are still viewed by many as a 'shopkeeper', and our use as an information resource is underutilised.'*

### **3.2. There is a lack of respect for the pharmacy team**

P375 stated; *'it still amazes me the lack of respect for pharmacy team, from the GP surgery staff, especially when we have had to chase lost prescriptions and errors which they are responsible for.'* P26 also felt that there was a lack of respect and doctors didn't take the pharmacists advice seriously; *'GPs don't value pharmacists' opinion!! I raised an overdose with a GP last week and it was dismissed by him as came from specialist and on further investigation it was an overdose and 5 times as much as recommended.'*

### **3.3. Time constraints**

It was felt by P67 that time constraints were the greatest barrier to interprofessional interactions; *'I would love to build stronger relationships with the GPs in the local surgeries, time constraints are the greatest barrier.'* In addition, P375 also stated how having poor interprofessional interactions can lead to wasted time *'as we have had to chase lost prescriptions and errors which they are responsible for. This usually takes many phone calls on our behalf and many man power hours'* P375.

### **3.4. Approachability of HCPs**

Here P174 stated that *'some other healthcare professionals more approachable than others'*.

### **3.5. Not being within close proximity to HCP**

The proximity to HCPs was seen to impact pharmacists' interprofessional relationships, with participants commenting how not being located alongside HCPs can have a detrimental impact on their interprofessional interactions. This has also been touched upon as a facilitator as those co-located alongside HCPs, i.e. within GP practices, recognised the positive influence this had on their HCP interactions. *'This type of pharmacy (ie within a health centre) allows us to interact very well with the GPs and surgery staff. It is noticeable that we do not have as good a relationship with other practices in the area'* P146. *'We are in a fortunate position in same building as GP surgery so have many interactions with healthcare professionals and a good working relationship but have worked in other places that are more isolated in this regard'* P478.

### **3.6. GP practices worry about having a close relationship with one pharmacy**

This barrier was stated by one participant, P67, believing that *'surgeries (GPs) worry about having an inappropriately close relationship with one contractor'*.

### **3.7. Pharmacists don't network with other HCPs**

Participant 679 believes that *'unfortunately the majority of community pharmacists are not willing to invest in their business and use free time to network with their professional colleagues'*.

### **3.8. Difficult to know which healthcare professional to contact**

When participants interact with other HCPs it is important to know who is best to contact, something that P264 found challenging stating that it's *'difficult to identify hospital prescribers from the information on the prescription form'*.

## **4. Perceived facilitators to interprofessional interactions**

Within this theme four facilitators to interprofessional interactions were described by participants:

### **4.1. Being in close proximity to other HCPs**

This was previously touched upon in section 3.4.3.5 as this was seen by participants as a facilitator but also a barrier for pharmacists if they are far away from other HCPs. In addition to that mentioned in section 3.4.4.3.5, P644 believes that when they move into a new healthcare centre they will engage more with other HCPs; *'In the next 12 months the pharmacy will be moving to a new site within a newly built medical centre. I plan to take on a pre-reg pharmacist and an Accredited Checking Technician and I plan to work closely with the practice manager'*.

### **4.2. Utilising private consultation room for other healthcare professionals**

Participant 679 believes that by utilising pharmacy space for other HCPs this can also help provide more holistic patient care; *'we have a private consultation room and lease it to – a podiatrist, an osteopath, a holistic therapist. Luckily we have the space, but at a cost and investment. Hopefully we are able to offer a more holistic healthcare service that improves patient outcomes'*.

### **4.3. Providing collaborative services**

By providing certain services this can lead to interactions with other specific healthcare professionals. P371 has frequent interactions with hospital staff due to their services; *'we provide all medication for a private hospital so this is why we have such frequent contact with hospital staff'*. P178 also has interactions with *'drug workers because we supervised clients'*.

### **4.4. Developing relationships in other pharmacy roles**

One participant, P61, has been able to develop their relationships with the local GP surgery as they work within it as a primary care pharmacist; *'I work as a primary care pharmacist one day a week in the surgery next door and have a good relationship with all the staff - receptionists, nurses, GPs, pharmacy techs'* P61. This once again links to both sections 3.4.4.3.5 and 3.4.4.4.1, as being with the health centre in close proximity to other HCPs has enabled the participant to develop relationships over being just within the community pharmacy.

## **5. Methods of improving interprofessional interactions**

Within this theme two different methods of improving interprofessional interactions were recognised by participants:

### **5.1. Participating in group meeting with GP practices**

Participant 67 said that group meetings with GP practices could help build relationships and potentially stop close GPs thinking they have an inappropriately close relationship with one pharmacy; *'maybe a group meeting with all local contractors needs to be the answer?'*

### **5.2. Having a way of emailing prescribers**

Another method to help ease interprofessional communication is having a method in which you the pharmacist can email prescribers; *'could do with a secure email system (NHS Wales email is not encrypted) to communicate more easily with prescribers for non-urgent matters'* P265.

## 6. Reasons for, and frequency of, participants interactions with specific HCPs

In addition, a number of participants made specific comments around their interactions with individual professions and have been shown in **Table Appendix K.2**.

**Table Appendix K.2.** *Reasons for, and frequency of, participants interactions with specific HCPs*

<b>Profession</b>	<b>ID</b>	<b>Comment</b>
<b>Pre-reg student</b> (Plus ACT)	338	'We have a pre-reg pharmacist starting in July so from then it will be daily contact'
	473	'Usually have a pre-registration student, don't have one this year, have community placements for pre-reg hospital students'
	644	'Will employ ACT and prereg when in new medical centre'
<b>GPs and surgery staff</b> (Plus hospital pharmacists)	375	'we have had to chase lost prescriptions and errors which they are responsible for'
	253	'In close communication with surgery staff daily due to stock shortages!'
	178	'Majority we have contact with are the receptionists at GP surgeries if we have queries with Rx'
	398	'Need to contact GPs/hospital pharmacists regularly to retrieve missing information when patients discharged from hospital to community and rely on MDS'
<b>Hospital staff</b> (Plus Opticians and Dentists)	371	'We provide all medication for a private hospital so this is why we have such frequent contact with hospital staff'
	503	'The majority of instances where I speak to hospital prescribers, opticians, dentists, it's because their prescriptions are illegible or missing information'
<b>Drug and alcohol tem</b>	178	'Drug workers because we supervised clients'
<b>Primary care pharmacists</b>	178	'Occasional communication with PCT pharmacists'

**Appendix L – Publication within the Journal of Interprofessional Care (abstract)**

As the abstract to this publication has open access this has been reproduced below. The full publication can be accessed through the Journal of Interprofessional Care:

JENKINS, A. I., HUGHES, M. L., MANTZOURANI, E. & SMITH, M. W. 2016. Too far away to work with each other: Does location impact on pharmacists' perceptions of interprofessional interactions? *Journal of Interprofessional Care*, 30, 678-81.

JOURNAL OF INTERPROFESSIONAL CARE  
<http://dx.doi.org/10.1080/13561820.2016.1191451>



## SHORT REPORT

## Too far away to work with each other: Does location impact on pharmacists' perceptions of interprofessional interactions?

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**ABSTRACT**

In recent years, the delivery of health services has seen a shift towards interprofessional teamwork in order to effectively utilise the skills of each member of the healthcare team to deliver optimal patient care. Nevertheless, a variety of barriers, including lack of communication between healthcare professionals (HCPs), have been identified. The expanding clinical services provided by community pharmacies have increased the potential for pharmacist-HCP interaction; however, primary care pharmacy environments vary from individual distinct premises to part of interprofessional 'health centres'. As such, one potential factor affecting interprofessional communication could be the geographical location ('space') of HCPs. This study sought to determine whether these different primary healthcare 'spaces' impact on the frequency of interprofessional interactions. An anonymous, self-complete questionnaire was sent to all community pharmacies in Wales ( $n = 716$ ) to quantify the frequency of interprofessional interactions between community pharmacists and other HCPs. A response rate of 62% was achieved. Results showed that pharmacists working in pharmacies physically linked to general practitioner (GP) surgeries had significantly more frequent interaction with HCPs based within the surgeries. This suggests that housing HCPs in the same physical space will enable more interprofessional interaction, supporting the drive to improve the quality of patient care.

**ARTICLE HISTORY**

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**KEYWORDS**

Communication; community pharmacy; healthcare professional; interprofessional; location; space

## Appendix M – Hospital questionnaire

### Who do pharmacists work with?

The aim of this study is to find out which members of the healthcare team do pharmacists, like you, work with on a day-to-day basis.

By completing the questionnaire you will be helping teaching staff in the School of Pharmacy and Pharmaceutical Sciences at Cardiff University to gain valuable information on the interprofessional interactions that take place when delivering pharmacy services.

The questions relate to your individual experiences in **this hospital** specifically. We are trying to capture the frequency of interprofessional interaction between pharmacists and healthcare professionals on a regular basis; therefore, if you work within this hospital **less than 2 days a week**, we would be grateful if you could pass this questionnaire to another pharmacist to complete.

This questionnaire should take **no longer than 5 minutes** to complete. Please remember that all replies are **completely confidential** and to return your questionnaire to the 'project champion' ie. the pharmacist responsible for the questionnaire within your hospital, or to a designated location specified by the 'project champion'.

### **Section A – About you and this hospital**

We would like to obtain some background information that will assist us in contextualising your answers. For this section, please answer related to the hospital you are working at today (referred to as "this" hospital in the questions).

Please tick **one answer** for each of the following questions unless stated otherwise:

**A1)** With which health board is **this** hospital associated?

Abertawe Bro Morgannwg       Aneurin Bevan       Betsi Cadwaladr       Cardiff & Vale   
Cwm Taf       Hywel Dda       Powys       Velindre

**A2)** How many beds are in **this** hospital?

Fewer than 100       100 to 299       300 to 499       500 to 700       More than 700

**A3)** How would you describe your position within the hospital?

Band 6       Band 7       Band 8A-D       Band 9   
Other  (Please state) \_\_\_\_\_

**A4a)** In which specialties do you **currently** work in? (Please tick all that apply)

Aseptic       Burns and Plastics       Cardiology       Care of the elderly   
Complex Health       Gastroenterology       Intensive care       Maternity       Medicines  
information       Medicines specialties       Mental health       Paediatrics       Primary      Care  
Respiratory       Stroke       Surgery       Women's Health   
Other  (Please state) \_\_\_\_\_      No specialty

**A4b)** If you have ticked **more than one**, however you have a particular primary specialty please state what this is: \_\_\_\_\_

**A5a)** In which parts of the hospital do you regularly work in? (Please tick all that apply)

Ward       Dispensary       Aseptics department       Office based       Primary Care       Other   
(Please state) \_\_\_\_\_

**A5b)** If you ticked **more than one** area please state the area in which you spend most of your working week: \_\_\_\_\_

**Section B –Members of the healthcare team**

In this section we are collecting information about members of the healthcare team with whom you interact with, as part of your job. Please tick a box for **each line** of the table which best describes the frequency of direct personal interaction (either face to face, by phone or by email) you have with that healthcare team member. If a healthcare team member is not listed here, please fill in the 'other' section and state the frequency of the interaction.

Member of healthcare team	At least once a DAY	At least once a WEEK	At least once a MONTH	At least once a YEAR	Less frequently	Never
Accredited checking technician (ACT)						
Care home staff						
Dentist						
Dietician						
Dispenser/Technician						
Doctor - Consultant						
Doctor - Junior (FY1/FY2)						
Doctor - Registrar (ST1 - 3)						
Drug and alcohol team						
General practitioner (GP)						
GP receptionist						
GP practice manager						
Health visitor						
Medicines counter/ Healthcare assistant						
Midwife						
Nurse - Community						
Nurse - Hospital						
Occupational therapist						
Opticians						
Paramedic						
Pharmacist - Community						
Pharmacist - Primary care						
Physiotherapist						
Podiatrist						
Pre-registration Pharmacist						
Radiographer						
Social worker						
Speech and language therapist						
Vet						
<i>Other (please state profession and frequency in the 'additional comments' box on the next page)</i>						

**If you have any additional comments you would like to make relating to which healthcare colleagues you work with please fill in the box below.**

**Thank you very much for your time in completing this questionnaire.**

Please return your questionnaire to the 'project champion' ie. the pharmacist responsible for the questionnaire within your hospital, or to a designated location specified by the 'champion'. Or alternatively please mail your response to Andy Jenkins at:

*Pharmacy Education and Practice, Cardiff School of Pharmacy and Pharmaceutical Sciences, Redwood Building, King Edward VII Avenue, Cardiff, CF10 3NB*

## Appendix N – Hospital questionnaire cover letter

### Who do pharmacists work with?

Dear Pharmacist,

I would like to invite you to take part in a study that aims to investigate the day-to-day interactions between pharmacists and members of the extended healthcare team.

Pharmacists working in all hospital pharmacy departments throughout Wales are being invited to take part and instructions on completing the study are detailed within the questionnaire.

The questionnaire is voluntary, however, I would greatly appreciate it if you could take **no longer than 5 minutes** out of your time to share your views with me.

The questions relate to **your individual** experiences in **this hospital** specifically. If you work within this hospital **less than 2 days a week**, please pass onto another pharmacist to complete.

By completing the questionnaire you will be helping teaching staff in the School of Pharmacy and Pharmaceutical Sciences at Cardiff University to gain valuable information on the interprofessional interactions that take place when delivering services.

Your responses will be completely **confidential**. Any information identifying the respondent will not be disclosed under any circumstances.

If you have any questions or comments about this study, feel free to contact myself, or my supervisors, using the contact details provided.

Your responses will be of great importance to my research and I very much look forward to receiving your completed questionnaire. The questionnaire should be returned to the 'project champion', ie. the pharmacist responsible for the questionnaire within your hospital, or to a designated location specified by the 'project champion'.

**Thank you very much for your time in completing the questionnaire.**

Yours Sincerely,

Andy Jenkins

Tel: 02920870516

JenkinsAI1@cardiff.ac.uk

Dr Louise Hughes

Tel: 02920876432

HughesML@cardiff.ac.uk

Dr Mat Smith

Tel: 02920879286

SmithMW1@cardiff.ac.uk

Dr Efi Mantzourani

Tel: 02920870452

MantzouraniE1@cardiff.ac.uk

## Appendix O – Template email for gatekeeper to aid hospital questionnaire dissemination

### Initial email

Dear Pharmacist,

*A project conducted by Cardiff School of Pharmacy aims to investigate the day-to-day interactions between pharmacists and members of the extended healthcare team within the secondary care environment.*

*You have been invited to take part in a **short confidential questionnaire** that should take **no longer than 5 minutes** of your time.*

*A paper copy of this questionnaire is available from myself at **(insert location)**. More information regarding the study has been attached in the form of a cover letter.*

*I would encourage you to take a short period of your time to complete the questionnaire, as this information will be valuable in understanding the interactions that take place between the modern day pharmacist and the wider healthcare team.*

*Once you have completed the questionnaire please return directly to myself or to **(insert location)**. If you would like further information regarding the study please contact myself, or the principle supervisor Andy Jenkins (**JenkinsAI1@cardiff.ac.uk**) directly.*

Kind regards,  
**(Insert name)**

### Reminder email

Dear Pharmacist,

*I emailed recently regarding a project conducted by Cardiff School of Pharmacy that aims to investigate the day-to-day interactions between pharmacists and members of the extended healthcare team within the secondary care environment.*

*Thank you so much to those that have already taken the time to complete the questionnaire, however if you have not yet had chance I would encourage you to take part by completing a **short confidential questionnaire** that should take **no longer than 5 minutes** of your time.*

*A paper copy of this questionnaire is available from myself at **(insert location)**. More information regarding the study has been attached in the form of a cover letter.*

*The information gathered from the questionnaire will be valuable in understanding the interactions that take place between the modern day pharmacist and the wider healthcare team.*

*Once you have completed the questionnaire please return directly to myself or to **(insert location)**. If you would like further information regarding the study please contact myself, or the principle supervisor Andy Jenkins (**JenkinsAI1@cardiff.ac.uk**) directly.*

Kind regards,  
**(Insert name)**

## Appendix P – Hospital interview cover letter

### Who do pharmacists work with?

Dear Pharmacist,

As a practicing pharmacist in Wales you have been invited to take part in a service evaluation surrounding the interactions of pharmacists and other healthcare professionals in practice.

Attached is a further information leaflet; please take the time to read through the information before deciding whether or not you wish to participate.

This evaluation is a follow up of a recent project sent to pharmacists across Wales that aimed to determine the frequency of interactions between pharmacists and healthcare professionals. In this evaluation we would now like to understand the nature of these interactions.

If you wish to take part please contact myself, Andy Jenkins (PhD student) or the principal investigator, Dr Mat Smith, through the contact details below and we will arrange a mutually convenient time and location to conduct a one-on-one audio-recorded interview. Your responses will be completely **confidential**.

By taking part in the interview you will be helping teaching staff in the School of Pharmacy and Pharmaceutical Sciences at Cardiff University to gain valuable information. This will help to inform the School's future undergraduate and postgraduate education provision.

If you have any questions or comments about this project, feel free to contact myself, or my supervisors, using the contact details provided.

Your participation will be of great importance to this project and I very much look forward to receiving your response, which can be done through contacting any of the evaluation team below.

**Thank you very much for your time, hope to hear from you soon.**

Yours Sincerely,

Andy Jenkins  
Tel: 029225 10138  
JenkinsA11@cardiff.ac.uk

Dr Mat Smith  
Tel: 029208 79286  
SmithMW1@cardiff.ac.uk

## Appendix Q – Hospital interview information sheet

As a practicing pharmacist in Wales you have been invited to take part in a service evaluation surrounding the interactions of pharmacists and other healthcare professionals in practice. Please take the time to read through the information before deciding whether or not you wish to participate.

### **What is the purpose of the service evaluation?**

This service evaluation is a follow up of a recent survey sent to pharmacists across Wales that aimed to determine the frequency of interactions between pharmacists and healthcare professionals. We would now like to understand the nature of these interactions in practice.

### **Who are the evaluators?**

This evaluation is to be undertaken by Andy Jenkins, a final year PhD student, and Dr Mat Smith, the principal investigator. This evaluation has been approved by the Cardiff School of Pharmacy and Pharmaceutical Sciences Research Ethics Committee.

Why have I been invited to participate in this evaluation?

You have been invited to take part because you are a practicing pharmacist in Wales and are therefore knowledgeable on the interprofessional interactions that take place in practice.

### **How will the evaluation take place?**

If you consent, you will be invited to take part in a one-to-one interview which will be audio-recorded. The interview will be conducted in private and will start by clarifying some initial demographic details, ie the health board you work in and your role within the pharmacy. The interview will then progress to determine your interactions with other healthcare professionals and the reasons behind these interactions. Please be aware that this interview is about your experiences in general and you will not be asked to divulge any patient/healthcare member specific information. The interview should last approximately 20 minutes.

### **Do I have to take part?**

The decision to consent lies entirely with you. If you wish to take part a mutually convenient time and location will be arranged through contacting one of the evaluation team through the contact details below. Consent forms will be provided and filled in at the interview to give you chance to clarify any points within this. One copy of the form will also be provided in advance for reference. The evaluation team will retain the other copy. You are free to withdraw from the study at any time without giving a reason.

### **How will the information collected be used?**

Confidentiality will be ensured at all stages of the research process. The transcripts will be anonymised and consent forms, transcripts, questionnaires and tapes will be kept securely in the School of Pharmacy & Pharmaceutical Sciences. Any information retained on university computers will contain a reference number in place of your personal data. Any personal details that are collected during the project will only be seen by the evaluation team and will not be kept for any longer than is needed to complete this project. It is anticipated that this will be no longer than 12 months. This evaluation could help the school in understanding the relationships pharmacists have in practice which could help inform the undergraduate and postgraduate pharmacy programmes in the future.

### **Who to contact to participate or for more information?**

If you are happy to take part or would like further information please contact Andy or alternatively Mat via the details given below. Please note that contacting the investigator does not commit you to participating.

**PhD Student:** Andy Jenkins (Email: [JenkinsA11@cardiff.ac.uk](mailto:JenkinsA11@cardiff.ac.uk) Tel: 029225 10138)

**Principal Investigator:** Dr Mat Smith (Email: [SmtihMW1@cardiff.ac.uk](mailto:SmtihMW1@cardiff.ac.uk) Tel: 029208 79286)

**Appendix R – Hospital interview consent form**

**Consent Form**

Please read the following statements and initial the boxes next to the statements for which you give consent.

Please also sign and date the form below.

- 1. *I confirm that I have read and understood the participant information sheet and have had the opportunity to ask any questions.*
  
- 2. *I understand that my participation is voluntary and I have the right to withdraw at anytime.*
  
- 3. *I understand that by signing the form I agree to give consent to participate within the evaluation.*
  
- 4. *I give my consent for the interview to be audio-recorded.*
  
- 5. *I agree to be contacted by the evaluators if clarification is needed regarding any points discussed during the interview.*
  
- 6. *I understand that verbatim quotes may be used in reports and if so, they will be anonymised.*

**Participant details**

**Name (please print):**

**Telephone Number:**

**Signature:**

**Email:**

**Date:**

**Name of Researcher:**

**Signature of Researcher:**

**Date:**

## Appendix S – Hospital interview schedule

**Aim: To explore the interprofessional interactions taking place between pharmacists and other healthcare professionals.**

### Main topics

Perception of interprofessional education (IPE) and interactions

Who do they interact with and how often?

What are the interactions about, what was their purpose?

How were the interactions undertaken?

Barriers and facilitators

Perceived benefits of interprofessional interactions

### Intro

Ensure consent forms have been signed and understood.

Explain focus of the project – To explore pharmacists interactions with other healthcare professionals

Confirm participant is happy to be recorded and stress that all data will be anonymised and is confidential

Explanation about interview: *“I am going to start with some general questions relating to your career as a pharmacist then I will follow on with a card-sorting activity focusing on interprofessional interactions and finish with some short questions relating to your personal experiences with other healthcare professionals in **THIS** hospital/primary care environment. Please remember that these are your opinions, there are no right or wrong answers. The interview should take approximately 20 minutes in total, I may make some notes throughout but these are for my own benefit and please feel free to ask any questions if you need to. If you need to stop at any time to talk to a customer that is also fine I will pause and restart afterwards.”*

### General questions

Could you first of all tell me a bit about your background as a pharmacist?

a) Which university did you study at?

b) When did you qualify?

c) How long have you worked within this hospital/GP surgery (interchangeable depending on participant)?

d) What other positions have you had during your career as a hospital pharmacist?

e) Have you done any other work outside of hospital pharmacy?

### Opening questions

Could you explain what the term interprofessional interaction means to you?

What do you perceive as the benefits of interprofessional interactions to yourself?

What do you perceive as the benefits of interprofessional interactions to the patient?

### **Reflective card activity**

Cards showing the top 15 professions hospital pharmacists work with (from data gathered in the previous questionnaire study) will be presented to the participant where they will be asked to arrange based on their experiences within the hospital/primary care environment the predominantly work within. *Prompt: "Could you now sort in order those who you interact with the most frequently to the least? These healthcare professionals have been chosen from the previous study of which pharmacists interact with based on your experiences in **THIS** hospital environment"*  
*"Hopefully that has started you to think about the various interactions which can occur within pharmacy. I'd like to look at a few of these in more detail."*

### **Questions related to card activity**

Questions will then be directed to the participant surrounding the top three healthcare professionals put during the card sorting activity. The same structure for each healthcare professional will be used and is shown below. Additionally if any other 'obscure' professions (when compared with the overall frequency data found in the previous project) they will also be explored.

I have noted that you have put ... as number ..... on your list; could you tell me a bit about a typical interaction with this profession?

What would you say are the main reasons for interactions with ...?

How did this occur?

How frequently would you interact with a ...?

Are there any barriers to these interactions?

Is there anything that could make these interactions easier?

Do these typical interactions benefit your learning?

Have you applied this learning since?

Is there a particular example of an interaction that you can think of?

Could you elaborate on that? When/How etc.

Have you had any other interactions with other types of ...? (this question for professions where there is different areas, hospital vs primary care doctors/nurses)

Are these similar to the interactions you have already discussed?

### **Final questions**

Do you have anything you would like to add about any other healthcare professionals?

Have you had any previous training in working with other healthcare professional? This could be at undergraduate level or from courses you have taken?

Is there anything specific at the moment that you would like to learn from another?

One method used to help improve interprofessional working is IPE, if you could design an IPE session that would help improve your practice what would this look like? *Who would this be with, what topics would this be on?*

In terms of quantity of your interactions with our professions, do you feel this is too much, too little or just right? – Can you explain why you think this?

## Appendix T - Hospital questionnaire free text comments

**Table Appendix S.1.** Additional comments made by respondents (represented by their individual ID code) in Section C of the hospital questionnaire (n=20)

ID	Comment
21	Regulatory liaise with consultant microbiologists, infection control nurses and other antimicrobial pharmacists within the health board
54	Outpatients receptionists, charitable organisation employees, medical secretaries
122	My core work is in medicines polices and procedures and PGD hence the need to counsel multidisciplinary teams
126	Constantly work with mental health nurses working in community mental health team, drug and alcohol team, home treatment teams. Also nurse managers and matrons
153	I work within a mental health specialist team
154	Multidisciplinary working is essential for pre-operative clinic - work closely with haematology consultants, anaesthetists, pre-operative assessment nurses. Communicate medication changes to surgical consultants and GPs where necessary
156	Difficult to quantify how frequently I interact with some professions, depends on rotational role, admissions ward, sessions covered
174	Nurse practitioners, dermatology specialist nurse, ward clerk - clerical staff
184	Working as part of a multidisciplinary team is very important and patient care
198	Aim to attend consultant or registrar ward rounds 2-3 times per week (part time work 3 days) in current role. Direct contact/interaction with medical teams everyday on wards. Currently undertaking IP course also so increase contact with consultant DSMP and Registrar
211	We have a nurse practitioner based in the pharmacy department working alongside us in anticoagulation. The clinical lead for anticoagulation is a consultant haematologist. We take referrals from consultants on a daily basis.
231	In the clinical trials role I speak to clinical research associates, R+D officers
244	Also have contact with Directorate managers, executive directors, welsh government, RPS, GPhC, GP and other royal colleagues, public health wales, academic colleagues.
263	Any healthcare colleague can contact medicines information but the regularity with which we interact with them is uncertain as the service is reactive to queries
267	I work mostly with the ward staff; junior doctors (FY1) and SMOs, nurses and charge sisters. I also work with another pharmacist (diploma tutor). I work with a medication management technician, however they cover the surgical ward when I'm not in - only work indirectly with them
288	In my role as cancer services lead pharmacist I regularly work with the following staff groups within the NHS: Finance/accounting, administrative staff, assistant technical offices, IM+T staff, estates staff, cleaners, managers, Macmillan staff, voluntary staff, cancer network team, pathology/biochemistry, human resources, procurement staff, patient representatives, porters
412	I am based of site of the main hospital in aseptic/manufacturing unit, my role is majority non-clinical
413	Can have significant contact with a range of healthcare professionals regarding use of our unlicensed products. This could range from advice on current formulation to excipient and allergy advice, to stock review and lead times on products. Also questions regarding new products. Aseptics queries are usually from secondary care consultants or nurses requiring information on stability and shelf lives for different temperatures of storage.
418	Work as a MDT - Dietician, nurses, consultant and registrar, biochemist
419	Microbiologist, ward sister