A classification of primary care streaming pathways in UK emergency departments: findings from a multi-methods study comprising cross-sectional survey; site visits with observations, semi-structured and informal interviews

Introduction

In response to rising demand and overcrowding at UK emergency departments models of service have been introduced whereby primary care patients are seen by primary care clinicians (general practitioners and nurse practitioners) working in services within or alongside emergency departments [1-4]. “Primary Care streaming” was introduced in 2017 as policy guidance from NHS England (with £100 million of capital funding available to emergency departments in England) to help manage increasing demand on emergency departments [5-9]. The recommended service design was based on a service operated at Luton and Dunstable Hospital (Bedfordshire, England) whereby patients attending the emergency department may be identified by emergency department nurses as having non-urgent problems, have a brief initial assessment at the ‘front door’ of the emergency department and are ‘streamed’ to primary care clinicians working in a co-located but distinct primary care service [7]. Primary care services in the community typically consist of general practitioner-led practices, pharmacy, dentist and optician services. However, primary care services that are co-located with emergency departments consist of care delivered by general practitioners, advanced care practitioners and primary care nurses. NHS England and Improvement (pre-April 2019 known as two NHS organisations - NHS England and NHS Improvement) recommends these services are in operation 8am-11pm, seven days per week with a robust governance structure in place to inform streaming

guidance and protocols [1]. Specific safeguards should be in place to ensure the safety of patients redirected off-site to another appropriate service, including the acceptance of the patient by the off-site service [9, 10].

A range of different primary care service models in emergency departments already existed before the policy implementation [1, 2]. Various methods of initial assessment have been described (see Table 1), including: primary care clinicians screening and directing patients, emergency department nurses streaming patients from the front door to a primary care service, emergency department nurses combining streaming with a triage process [2]; and patients being called for assessment and treatment by the emergency department nurses ('see and treat') [11]. Other processes include patients being directed after assessment to other on-site services, or redirected off-site to community primary care services [5]. However, variation in descriptions of the way these assessments are implemented and conflated terminology causes difficulties in assessing performance, improving quality or gathering evidence about safety, clinical effectiveness. Uncertainties about the evidence for costs and effects of different approaches to streaming make such research vital to planning the continued (or different) policy about and delivery of "primary care type services" in emergency departments [1, 12].

Table1. Key activities for managing patients arriving at emergency departments [1, 11]

Triage[1]	A **clinical** activity to **sort** patients by acuity so that those with the greater need are seen first.
Streaming[1]	An **operational** activity to assess whether **low acuity** patients are suitable to be seen by an appropriate non-ED clinician.

Simple Assessment[11]	A brief 'hands-off' assessment (i.e. no formal clinical assessment) that enables patients to be flowed to a suitable treating clinician.
Complex Assessment[11]	A detailed assessment, including a clinical assessment. This may involve measurement of clinical parameters e.g. NEWS2 score, and initiation of investigations (e.g. blood or radiological tests).
See and treat[11]	The first clinician to see the patient is responsible for all diagnosis and treatment – usually used for patients presenting with minor illness or injury.
Navigation[11]	Patients are directed to an appropriate on-site service without a formal process of clinical assessment. This process is carried out by a non-clinician (receptionist) or computer kiosk, using clear criteria.
Redirection	Patients are sent to a care provider at another geographical site. This may be in the context of a formal care relationship e.g. to an Urgent Treatment Centre / GP Out-of-Hours facility/ GP Hub or Surgery or a dentist / pharmacy.

The GPs in EDs Project

This study is included in phase two of a larger project evaluating effectiveness, safety, patient experience and system implications of different models of primary care services in or alongside Emergency Departments in England and Wales.[13] In phase one we drew on findings from a realist rapid review, results of a national survey and follow-up interviews

with clinical directors and an initial stakeholder conference (February 2018) to develop a taxonomy of the form and function of primary care services in or alongside emergency departments [1].

Aim of this study

To help our evaluation and enable consistent conceptual understanding of streaming for evaluation, a clearly defined classification was needed which identifies and describes in detail the emergency department streaming pathways to primary care services. Therefore, we carried out a more focused study of how patients are asessed on arrival at an emergency department and are streamed or redirected to on-site or off-site primary care services. In this paper we aim to describe and classify the predominant types of primary care streaming pathways in different models of emergency department primary care services in England and Wales using additional data from directly observing streaming and a second stakeholder conference.[1].

Methods

We used a multi-stage (and iterative) method, firstly distributing an online survey to emergency departments across England & Wales, then interviewing selected clinical leads, and finally, undertaking case studies of certain sampled emergency departments. Thus we sought greater detail from sites illustrating specific features, and used the in-depth site visits for detailed description of different types of streaming pathways.

Cross-sectional survey

In September 2017 we distributed an online survey (www.onlinesurveys.co.uk) (and reminder) to all type 1 emergency departments(consultant-led 24-hour services with full resuscitation facilities)in England (n=171)and Wales (n=13).[14] The survey was designed and piloted by our study management group comprised of, academic GPs and ED clinicians (doctors), and patients. We used the expertise and experience of some of our emergency department clinical contacts to review the survey and support us in validating the survey content. The survey topics covered a range of questions relating to primary care services located in or alongside the emergency departments and included specific questions relating to primary care streaming (e.g. how and what type of patient groups were selected for primary care streaming; how they were streamed to primary care; and who streamed them; seeAppendix1). [1]We identified whether the department had made capital funding bids for streaming (data available from Department of Health) when these were available in 2017 and used this to assess non-response bias. We supplemented the responses with other publicly available data (e.g. https://www.Nhsbenchmarking.nhs.uk/ and https://www.healthylondon.org/ resource/londonuec-stocktake/) and publicly available documents (including Care Quality Commission reports, Board papers and news items sourced from internet searches).

Clinical lead interviews

Using survey data, we purposively selected a sample of 30 potential study sites that reflected three different models of emergency department primary care services ("inside-integrated", "inside-parallel" and "outside-onsite" – see Table 2 [1]) to invite participation in a follow-up interview. It was important to capture variation in context, so we selected departments that described different ways of streaming patients to primary care services

and departments of different sizes and locations [see Box 1 below]. Clinical leads were invited by email and written informed consent was obtained before conducting interviews.

The aims of these interviews were to gather more in-depth descriptions of how their primary care service models operated, to help with selecting a sample of study sites with varying experiences of successes and challenges. Primary care streaming was one component included in our semi-structured interview guides. Follow-up questions asked about which members of staff carried out initial assessments, how they made streaming decisions, and the services to which they streamed patients [see Appendix 2]. Interviews were conducted by telephone or in-person by ME between February 2018 and March 2019 (average length 60 minutes). All interviews were audio-recorded and transcribed verbatim. Ethical approval for the survey and follow-up interviews was given by Cardiff University School of Medicine Ethics Committee (ref: 17/45).

Box 1: Selection criteria for the purposive sample of Emergency Departments

In EDs where a primary care service had been implemented in the emergency department since 2010 we selected sites to ensure we included:

- Variation in service model - delivering a separate primary care service, inside or outside the footprint of the emergency department, a primary care service integrated with the emergency medicine service or
- Spread of geographical locations in England and Wales
- Variety of contexts - including hospitals in rural and urban locations, small and large hospitals, higher vs lower attendances
- Variation in streaming method – who streams, streaming criteria and guidance
- Variation in the physical layout of the department

Case study observations and interviews

Part of the larger evaluation involved using the taxonomy of primary care models in or alongside emergency departments to categorise emergency departments and carry out more in-depth exploration of how these models functioned. We invited clinical directors of 13 emergency departments from our interview sample to volunteer their department for in-depth 'case study' site evaluations. The sampling strategy included three or four emergency departments from the three different types of primary care service models and three emergency departments with no primary care service models (see Table 2). To ensure maximum diversity of types and characteristics of emergency departments we also selected hospitals of different sizes, different levels of attendance and different geographical variations locations throughout England (there were no GP models in use in Wales).

Table 2. Primary care service models

Primary care service model	Description
Inside: integrated	A primary care service fully integrated with the emergency medicine service, where staff see both primary and emergency care patients (n=3).
Inside: parallel	A separate primary care service within the emergency department, for patients with primary care type problems (n=4).

Outside: onsite	Primary care service is elsewhere on the hospital site (n=3).

We conducted visits between February 2018 and April 2019. Two researchers (ME, a medical sociologist and AC, a clinical research fellow and GP) visited each case study site for three days. We observed patients arriving at the reception desk and triage and streaming assessments and conducted formal and short informal interviews with nurses with responsibility for carrying out streaming and triage assessments and other clinicians (ED doctors and primary care clinicians to ask them about how streaming worked in the ED [see Appendix 3]Observations were carried out during the hours that primary care staff worked in the department (generally between 8am and 10pm) and included weekdays and weekends. Observations and informal interviews were recorded in field notes and formal interviews were audio-recorded and transcribed verbatim. Ethical approval for case study visits was given by Wales Research Ethics Committee 1 (ref: 17/WA/0328).

Data analysis

Survey

For this paper the survey data were analysed descriptively to summarise how many departments had primary care services and the methods of streaming that were reported.

Clinical lead interviews

An initial thematic coding framework was created by ME that was partly deductive (based on our earlier rapid realist review, survey responses and taxonomy of models [1, 15]) and

partly inductive (based on the interview data).The themes to be included in the thematic framework were discussed and agreed with two other researchers (AC and FD). Interview transcripts were coded in NVivo11 (QSR International, Daresbury; see appendix 4) to themes/ and subthemes within this thematic framework, also allowing for new themes to be identified.[16] The themes were explored to identify patterns of commonality, variations and differences between and within different models of primary care streaming pathways in emergency departments.[17] A proportion of the transcripts (40%) was independently coded by a second author (DP). Agreement between coders was high (>90%), with only minor amendments and clarifications made to the coding.

Case study visits

Interview transcripts and observation notes from case study visits were also coded in Vivo 11 to identify themes relating to primary care streaming. We triangulated themes from the survey responses, interviews with clinical leads and themes from interviews and observations at case study sites to produce a set of draft classifications for methods of streaming. Because data were collected from multiple sources, we sometimes encountered elements of conflict between these sources. To resolve this, we used a hierarchy approach in which fieldwork observations (where available) were considered the most reliable, followed by clinical director interviews, survey responses and other data sources, in descending order of reliability [1]. These were based on: where streaming took place (at the front door or inside the emergency department); who streamed patients (level of nursing or other staff); to where patients were streamed (emergency department, primary care service or other hospital services); and to where patients were redirected (off-site).

Consultation with Stakeholders

We held a second stakeholder conference in December 2019 which was focused on describing streaming methods, exploring theories of patients' acceptability of streaming and patient safety. Invited attendees included emergency department and primary care clinicians, service managers, primary and emergency care academics, patient and public contributors and Royal College of Emergency Medicine representatives. Attendees received information packs including a diagram of the pathways to primary care to read before attending the conference. At the conference, a workshop was held where attendees were shown different streaming pathways and were asked to evaluate statements based on patients' experiences of streaming (data presented from the case study sites). Feedback was obtained verbally (flipchart summaries) and in writing on feedback forms.

Patient and public involvement

Patients and public members were involved in the study design and as co-applicants in the funded study.[13] They used their experience as NHS patients to contribute to the content of the questionnaire and qualitative interview guides and also advised on recruiting public and patient contributors to the stakeholder conference. They were involved in discussing the draft classifications in Management Group meetings, and at the Stakeholder conference [18]

Results

Summary of survey findings

Seventy-one English and six Welsh survey responses were received (n=77/184, 42%).In addition, we obtained data for 41 English departments from other sources (e.g. NHS

Benchmarking), including five English Type 1 departments that had not been invited to complete the survey (status can change year on year), totalling information on 62% (n=118/189) of type 1 emergency departments in England and Wales.[1, 15] Of the 71 English survey responders, 82% (n= 58/71) had applied for capital funding, and of 100 non-responders in England, 84% (n=84/100) applied for capital bid funding [1, 15] Table 3 summarises survey data on who streams which patients and how to primary care staff.

Table 3. Summary of survey data on streaming

Survey Question: Who streams patients to primary care staff?	**Number of responses (EDs)**
ED nurse	37
GP self-selects	23
ED Dr	16
Primary Care nurse	9
111 telephone triage service books appointments	9
Paramedics stream ambulance patients	6
Other	2
Which patients are streamed to a primary care staff?	**Number of EDs**
Primary care problems	49
Low acuity (including minor trauma)	28
Only specific groups	
Directing patients from the front door to most appropriate area or clinician within ED	11
Directing patients from the front door e.g. to ED or community	9
Undifferentiated patients (same case mix as ED clinicians)	7
Other	2

How are patients selected to be streamed to primary care staff?	Number of EDs
Using locally developed criteria	35
Using clinical judgement	35
Using a national tool (e.g. Manchester Triage System)	11
Other	3

Numbers total more than 77 as responses not mutually exclusive

Qualitative findings

Selecting a sample of emergency departments that used streaming

We conducted interviews with 21 emergency department clinical leads following the survey. Only 11 emergency department streamed patients to a primary care service: five departments streamed at the 'front door' (before patients were booked in at reception), and six had nurses streaming from 'inside the department' (after patients were booked in at reception).

Case study observations and interviews

Streaming was carried out in eight of 13 emergency departments in which we were conducting visits for in-depth observation and interviews (hospitals 3, 4, 6, 7, 9, 10, 11 and 13). Of the five that did not operate streaming, three emergency departments did not have a primary care service (hospitals 2, 12 and 15) and in the two other departments general practitioners selected their own patients (hospitals 8 and 14).

We observed a range of pathways used to allocate patients to primary care clinicians (GPs and nurse practitioners), emergency department clinicians (doctors, nurses), clinicians (doctors, nurses) in other hospital services or redirected to community primary care services. These can be summarised as follows:

1) **Front door streaming** (patients streamed by a nurse at the front of the emergency department – before being booked in at reception),

2) **Streaming inside the emergency department** (patients streamed by a nurse working inside the emergency department– after being booked in at reception),

3) **No primary care streaming** (usual triage, with GPs self-selecting patients)

4) **Combined streaming pathways** (combinations of 1-3 within the emergency department or across the ED and primary care services, varying at different times).

These will now be described, including their implications for other activities such as triage and re-direction. Figure 1 portrays three pathways (1-3) where patients are first seen by a clinician (usually an emergency care nurse) at the front door and have a rapid assessment before being streamed; or are first seen by a receptionist and booked in before being streamed from a triage room inside the emergency department to the emergency department areas (minors, majors, resus), to a primary care service or to other hospital services (e.g. eye clinic, early pregnancy unit, GP out-of-hours service); or are redirected to community primary care services. We refer to themes and subthemes from our thematic framework (appendix 4) throughout this section)

Fig 1. Streaming pathways in emergency departments

1. **Front door streaming**

Senior emergency department nurses typically carried out a rapid assessment (with observations of vital signs if necessary) in a cubicle near the emergency department front door (see theme 1.1,see appendix 4 for list of themes) and streamed patients to emergency, primary care or other hospital services based on Manchester Triage scores and using streaming criteria (hospitals 9, 10, 13; see Figure 2). Patients then book in at the emergency department reception and are 'flowed' to be seen by emergency department clinicians or primary care clinicians working in a treatment room next to the emergency department (inside-parallel model) **or** to an urgent care reception in a separate part of the hospital with a separate entrance to be seen there by a primary care clinician (outside-onsite model).

"We have to have experience up front because it's an extremely important job getting them in the right place". (Senior nurse at hospital 10)

Within the 'front door streaming' type, some variations were identified (Figure 2). At hospital 9 we observed a non-clinical 'navigator' who assisted with redirecting patients after they were streamed, helping to book appointment slots with community primary care services (theme 2.1).

> *"So, we have a navigator who's a clerical individual who will phone up your GP and say can you see this patient today and they'll say yes, tell them to come along at 4 o'clock and we send a bunch of patients away every day using that methodology".*
>
> (Clinical director, hospital 9)

At hospital 13 (an outside-onsite model) there were two separate front doors, two reception areas, streaming from the emergency department into the emergency department or to the reception area of the urgent care centre in part of the hospital 100 metres away from the emergency department.

Fig. 2 Variations in front door streaming pathways

Different pathways for children

At hospital 13, children were assessed and streamed at the *front door* to which adults attended, but with specific criteria for children to be streamed to a children's area of the emergency department or to an urgent care centre. At hospitals 9 and 10 children were streamed to be assessed by a triage nurse in a dedicated paediatric emergency care area *inside the emergency department*. At hospital 10, streaming criteria were applied during the triage process to stream children to the urgent care centre if appropriate. At hospital 9, children could also be redirected to community primary care services *(theme 1.4)*.

2. Streaming inside the Emergency Department

Combined streaming and triage assessment was carried out, usually by an emergency department nurse or a paramedic, in a triage room *inside the emergency department*, after patients had booked in at reception. Patients could be streamed to emergency medicine, primary care or other hospital services (e.g. radiology (theme 1.2).

At hospitals 4, 6 and 7, some patients were also streamed to the out-of-hours services (theme 1.7). This occurred on a limited basis at certain times of the day (e.g. two patients per hour after 6pm and weekends), if the emergency department primary care service was understaffed, not staffed or in the process of closing. However, streaming to the out-of-hours GP services was also not consistently available (e.g. where the out-of-hours GP service was understaffed or unattended due to high levels of demand or GPs doing home visits, respectively).

Figure 3 shows a variation in emergency departments that use streaming inside the emergency department. At hospitals 4 and 6 streaming was combined with emergency department triage but at hospital 7 primary care streaming was a separate process from emergency department triage and the urgent care centre nurses also called some patients to 'see and treat'. The approach to streaming here was described as 'complex streaming' (theme 1.3), required an additional stage of 'non-clinical streaming ' by receptionists at the ED reception (using strict criteria) and it was adapted based on levels of demand (theme 1.10):

297 *"When I say streaming, because **it can mean all sorts of different things, they do***
298 ***'complex streaming'**, so like 'see and treat', and **they do whatever assessment is***
299 ***needed essentially, so it's not just sign-posting**".* (Clinical Director, hospital 7)

300 **Fig.3 Variations in 'streaming inside 'pathways**

301

302

303

304 *Different pathways for children*

305 At hospitals 7 and 11, there were separate emergency departments for adults and children
306 and an outside-onsite urgent care/primary care service. No children were streamed from
307 the children's emergency departments to the primary care services, and there were
308 procedures to transfer children from the urgent care/primary care service to the children's
309 emergency department if needed (theme 1.4).

310 "Any child that turns up in the children's ED is seen, there's no streaming or re-direction from
311 there If they turned up at the walk-in centre, and there was an ANP or GP on who could see
312 children, they would be seen there, and if it's thought that they need a high level of care then
313 they would be moved on". (clinical director, hospital 11)

314 3. **No primary care streaming**, **usual triage**

315 In two services that we observed, primary care clinicians were integrated into an emergency
316 medicine team ('inside-integrated' model), the usual triage assessments were carried out
317 and primary care clinicians selected which patients they saw patients based on their

experience and interests (hospitals 9, 14) (themes 1.8 and 1.9). Primary care clinicians at hospital 14 focussed on a specific group of emergency care patients (e.g. frail elderly patients) during daytime hours and saw patients with low acuity minor illness from late afternoon into the evening. Patients with ongoing primary care conditions and those deemed not in need of urgent care were not redirected to community primary care services due to the distance between the hospital and those services (theme 2.4)

4. Combined methods (including streaming and GPs selecting primary care patients)

We observed combined pathways to primary care in some emergency departments.

Front door and further inside streaming

Front door and further inside streaming were observed in some departments. At hospital 10 there was parallel streaming for patients arriving at the front door of both the ED and Urgent Care Centre, with a streaming nurse at the front door of the ED and a primary care nurse streaming from the urgent care centre (theme 1.5). Patients at hospital 13 needing specialist geriatric care could also be streamed to a geriatric emergency care unit within the ED (them 1.6).

> *"we've actually got an emergency geriatric unit, which is now sitting in the old GP unit, which is attached to the A&E, and the urgent care centre moved a little bit away from the A&E. So we've got three streams now, rather than two"*
>
> (Clinical Director at hospital 13)

At hospitals 10 and 13 the streaming nurse at the emergency department front door could stream patients not suitable for emergency care to the urgent care centre where a primary care triage nurse could also (re-)stream them to a primary care clinician, to other hospital services such as the eye clinic or early pregnancy unit, or hand them back to the emergency department (theme 2.3). The primary care nurses at hospitals 10 and 13 could also make telephone calls to redirect patients with ongoing or non-urgent primary care problems into booked appointments at their own GP surgery (themes 2.2 and 2.5).

> *"They're sent to another reception area, and they have got nurses and other things there who screen there, there is a bit of a duplication still, and the new urgent care centre what they do when they screen them, is either they see the GP or the practice nurses type of thing, or they actually give them a GP appointment to go and see their own GP the next day if they don't think it's urgent or anything"*.
>
> (Clinical Director, hospital 13)

Streaming inside the emergency department and primary care clinicians selecting emergency care patients

At hospital 3, streaming decisions were made *inside the emergency department* during a triage assessment. A wider range of hospital services was available, to which patients could be streamed within the emergency department; these included general practitioners, physiotherapists, occupational therapists, older person's nurse, chest pain nurse or psychiatric nurse services. The model here was described by the clinical lead as an "integrated front door model" although streaming was *inside the emergency department*. However, some GPs with a special interest in emergency care conditions also self-selected

some patients waiting in the emergency department stream (theme 1.8). At hospital 3 non-urgent primary care patients or patients with ongoing primary care problems were also not redirected to community primary care services because of the distance between the hospital and those services (themes 2.4 and 2.5).

> *"There's general practice out there, but again because of our rurality, if a patient has spent 40 minutes to come to the ED, we didn't think there would be a safe option to do a quick assessment, and turn them around to an appointment which might be hours ahead in the day and also a journey away"*. (Clinical Director, hospital 3)

Streaming inside the emergency department and non-clinical streaming by reception staff in a primary care centre.

At hospital 11 in addition to *streaming inside the emergency department*, receptionists in the primary care walk-in centre used proforma screening questions to make decisions on where to direct patients entering the front door of the primary care centre (theme 1.10). Patients were directed to the emergency department if they were deemed to need emergency care or were directed to wait for the primary care clinician in the primary care walk-in centre. Patients who needed primary care services not offered at the walk-in centre were re-directed to their community primary care service (theme 2.1).

Stakeholder consultations

We used summarised notes from stakeholders' feedback to help us refine the figures presented above to describe the way services work and to help us clarify terminology.

Discussion

Principal Findings

Our classification (Figure 1) reflects the most common emergency department streaming pathways to primary care services, usually performed by emergency care nurses: front door streaming; streaming inside the emergency department (usually as part of the triage process); or without streaming but primary care clinicians selecting patients. These methods were used in combination in some services. Pathways were influenced by whether the primary care service was 'inside' or 'outside' the emergency department and were often adapted, based on local circumstances such as the department layout, patient demand levels, skill mix and interests of primary care clinicians and accessibility of community primary care services (Figures 2 and 3). Varied approaches to streaming were also implemented for specific groups of patients (e.g. older people and children). Pathways were in place to redirect patients with non-urgent primary care problems to community primary care services in most services, with local variation in protocols based on staffing, patient demand and links to community primary care services.

Strengths and weaknesses

The sampling process was based on results from a national survey, and responses from emergency departments with a wide range of characteristics and contextual influences, different sizes and various locations in England and Wales. The principal models of primary care services in emergency departments were all represented,[1]The principal models of using general practitioners in emergency departments were all represented [1], and there was no evidence of non-response bias for the important aspect about whether or not the department had applied for the capital funding to develop "clinical streaming" in 2017 [1].

From this range of departments, we could ensure maximum variation in the sample. We gathered in-depth qualitative interview and observational data from a variety of staff groups, ranging from clinical leads to nurses, GPs and reception staff working on the streaming, triage and redirection pathways within the emergency department and primary care services.

One limitation is the survey response rate (42%) and limited number of sites studied as part of the larger study of primary care services in emergency departments,[13]GP models in emergency departments [13], so there may be other service models and streaming pathways which were not included in our classification. Further survey research could help explore whether our classification is more widely applicable and whether there are other variations implemented.

Context of other literature

Our classification builds on descriptions of primary care service models within or alongside emergency departments [1, 2], We have previously classified primary care service models in terms of where patients are seen by primary care clinicians, how these service models function across a spectrum of integration (from more primary care to more emergency medicine service, and including streaming as a construct within the spectrum of integration that varies across the GP models). In this paper we have provided in-depth descriptions of the range of initial assessments (clinical and non-clinical) and the ways patients are directed to emergency and primary care clinicians in the ED or to other primary and secondary services, on and off hospital sites. 'Front door streaming' was generally consistent with the policy literature [9]. Our description of streaming '*inside the emergency department'*

encompasses the range of processes described by the Royal College of Emergency Medicine within their definition of 'complex streaming' (see Table 1) [11].Within our study we also observed the use of 'see and treat' and non-clinical routing carried out by non-clinical members of staff [11].

Implications for policy and practice

Although policy guidance was developed based on a 'front door' streaming model,[9] local context may not allow for this. Our study shows most emergency departments had implemented streaming pathways with greater flexibility, adapting to local contextual variations (such as the availability of staff, primary care demand and case-mix, design of the department, relationships with out-of-hours and in-hours primary care services and other community primary care services).

Good practice guidance issued in 2017 recommends safeguarding measures to ensure that non-urgent patients are redirected off-site to other available services appropriately and safely [19]. However, more recently, redirection is not generally recommended or endorsed by the NHS due to safety risks. Despite this, we saw variation in redirection pathways, from patients being advised to seek access to in-hours primary care, to nurses making telephone calls to check availability and book appointments in community GP practices. However, using time to make safe redirection arrangements can potentially slow down the triage and streaming process and negatively affect assessment time targets. Having a non-clinical member of staff (a navigator at hospital 9) to assist with redirection and to help access GP appointments for patients was perceived as helping to overcome such delays and ensuring patients were redirected safely and efficiently. Local agreements between emergency

departments and general practices, with for example some GP appointments reserved for patients being redirected, could support such navigation. The Covid-19 pandemic has prompted efforts to better integrate clinical systems e.g. the 111 telephone and internet clinical triage system and face-to-face urgent and emergency care. The ability of digital care to help integrate a decentralised care model relies on high quality data, and until there is consistent measurement of streaming, it will be difficult to decide how effective it is in practice and which models of care are optimum.

Further research

All such developments depend on effective streaming. The classification proposed here provides a basis for further research to evaluate and understand how streaming operates and its effectiveness across a range of emergency and primary care service models in emergency departments. Further research that takes account of the heterogeneity of streaming pathways is required to examine experiences, barriers, enablers, and concerns about implementation. Our classification can help inform quality improvement/performance measurement as well as development of policy and practice. Key quality outcomes measured against our classification could include emergency department waiting times, patient flow and experience, patient safety and cost-effectiveness, about which there are still considerable uncertainties [12]. Redirection processes also need to be evaluated to assess the feasibility of patients accessing off-site services (especially in rural locations), their safety, acceptability to patients, completion of follow-up with other services and associated clinical outcomes [10, 19]. A more in-depth focus on streaming policies and their outcomes for specific patient groups such as children, the elderly or those with

musculoskeletal or mental health problems would also be valuable. Evaluations based on this classification would offer potentially transferable findings.

Conclusion

Our study has highlighted how a central government intervention with a clear stated intended model has resulted in a highly heterogeneous range of models of care. We have shown that pathways for directing patients between emergency care and primary care services (including streaming, triage, primary care clinicians selecting their own patients and redirection) vary across the different models of primary care services in emergency departments. The three main pathways observed were: streaming at the front door; streaming inside the emergency department; no streaming but with primary care clinicians self-selecting their patients. Local clinical leads and managers need to consider which pathway(s) may best suit their local context and needs. Consistency of terminology used to describe pathways between emergency departments and primary care services is necessary for performance measurement, quality improvement and rigorous future multi-site evaluative and descriptive research.

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