

COMMENT

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Addressing evidence gaps in haemodialysis care: a critical review of clinical trials, technological innovations, and implementation priorities

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Abstract

Kidney failure treated with maintenance haemodialysis (HD) carries high risks of premature mortality, hospitalisation and impaired quality of life, yet important evidence gaps persist across routine HD care. The Dialysis Research Innovation Network, part of the UK Kidney Research Consortium, convened the inaugural UK Haemodialysis Research Nexus in Birmingham on 11th May 2026. There were fifty-six delegates: 22 doctors, 13 nurses, six dietitians, one renal scientist, seven people in other roles (including one patient), and seven whose role was not recorded. The meeting reviewed recent trials, emerging technologies, research methods, career development and national priorities. The NightLife trial randomised 100 participants to extended-hours in-centre nocturnal or conventional daytime HD. Recruitment was below target and consequently its primary quality-of-life result was inconclusive (adjusted mean difference 3.00 points, 95% CI -12.4 to 18.3), while exploratory secondary findings generated hypotheses concerning cognition, biochemical control and treatment burden. PISCES found fewer serious cardiovascular events with 4 g/day n-3 polyunsaturated fatty acids than placebo (0.31 versus 0.61 events per 1,000 patient-days; hazard ratio 0.57, 95% CI 0.47–0.70), without a clear all-cause mortality benefit. PHOSPHATE continues to test intensive versus liberal phosphate targets using pragmatic international infrastructure. Portable, wearable and implantable kidney-replacement technologies, patient-inclusive trial design, routinely collected data, knowledge mobilisation, mentorship and a James Lind Alliance priority-setting partnership were also discussed. The meeting identified the need for inclusive eligibility, proportionate funding, lower-burden trial delivery and outcomes that matter to patients. These proceedings are a structured report of presentations and discussion rather than a formal consensus guideline. Sustained collaboration among patients, clinicians, researchers, registries and funders is needed to convert innovation into equitable improvements in HD care.

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Keywords Haemodialysis, Clinical trials, Patient centred outcomes, Dialysis technology, Research prioritisation, Nocturnal dialysis, Cardiovascular outcomes, Implementation science

Introduction

Patients receiving maintenance haemodialysis (HD) experience markedly reduced life expectancy and substantial cardiovascular morbidity [1]. Treatment also constrains employment, relationships and quality of life [2]. UK Renal Registry data indicate that more than 24,000 adults were receiving centre-based HD at the end of 2022; counts vary by year and by whether home HD is included [3].

Despite the scale of the problem, the evidence base underpinning many routine aspects of HD practice remains incomplete. Across trials in common chronic conditions, median exclusion rates of eligible patients exceed 75%, and patients with dialysis-dependent kidney failure, with their comorbidity burden, polypharmacy, and altered pharmacokinetics, are among the most consistently excluded (4). These evidence gaps are not incidental but reflect a structural underinvestment in dialysis research that is disproportionate to the scale of the disease burden.

Kidney disease affects approximately 850 million people worldwide and was estimated to cost the UK NHS £6.4 billion annually, with a modelled scenario of £10.9 billion by 2033 [5, 6]. The same modelling estimated £372 million in annual productivity losses from dialysis and a possible near-fourfold increase in capacity requirements under specified assumptions; these are scenarios, not forecasts [6]. Despite its substantial health and economic burden, kidney disease receives limited specific attention in the current 10 Year Health Plan for England and is not identified as a standalone clinical priority [7]. Across reporting years (and with public funding excluded), the British Heart Foundation committed £108 million to cardiovascular research [8]; Cancer Research UK spent £403 million on new and ongoing research [9], compared with approximately £11 million invested by Kidney Research UK, the UK's leading kidney disease charity [10]. Analysis of UK government research investment suggests that this disparity is systemic. Although renal research funding appears proportionate to disease burden when viewed in isolation, it may reflect the prioritisation of areas that receive less support from major charitable foundations. When all funding sources are considered collectively, however, the true scale of underinvestment in kidney disease research becomes clear [11]. The consequence is a self-reinforcing cycle; evidence gaps weaken grant applications, limited funding perpetuates those gaps, and patients with kidney failure bear the ultimate cost.

Addressing this requires a coordinated infrastructure, well-designed trials, transparent priority setting and advocacy for proportionate investment. As part of the UK Kidney Research Consortium, the UK Dialysis Research Innovation Network (DRIN) hosted the inaugural UK Haemodialysis Research Nexus in Birmingham on 11th May 2026. The event focused deliberately on HD; peritoneal dialysis was outside scope. Transplantation remains the preferred kidney-replacement option for suitable patients, and equitable access to transplant assessment is an important research and service question, but it was not a principal meeting topic. Five sessions covered recent and ongoing HD trials; research design and funding; technology; career development and knowledge mobilisation; and early-career research.

Methods

This report was prepared from the meeting programme, speaker slides and contemporaneous notes. There were fifty six delegates including: 22 doctors, 13 nurses, six dietitians, two specialist scientists, seven in other roles (including representatives from funders, business partners and one patient) and seven whose roles were not recorded. Session summaries were drafted by the author group; key learning points were synthesised narratively after the meeting rather than derived through formal voting. Table 1 reports meeting learning points, while Table 2 maps barriers raised across sessions to potential responses and candidate endpoints. Unpublished trial, portfolio and priority-setting figures are identified in the text; authors have approved individual sections and unpublished data.

Recent and ongoing UK haemodialysis research

In-centre nocturnal haemodialysis: the NightLife Trial

Professor James Burton presented results from the NightLife Trial (ISRCTN87042063), a pragmatic UK randomised controlled trial comparing thrice-weekly extended-hours in-centre nocturnal HD (INHD, 6–8 h per session) with conventional daytime haemodialysis (3.5–5 h per session) over six months. The primary outcome was the Kidney Disease Quality of Life – Short Form (KDQoL) total score over six months, analysed using repeated measurements at 1, 3 and 6 months [12, 13]. The trial randomised 100 participants (57 INHD; 43 daytime HD) across 11 dialysis units in seven UK organisations to thrice-weekly INHD (6–8 h per session) or conventional daytime HD (3.5–5 h) for six months [12, 13]. The unequal totals arose within a trial whose original allocation was weighted 1:1.33 towards INHD to allow

Table 1 Key learning points from the UK Haemodialysis Research Nexus, 11th May 2026, Birmingham

Session	Key learning points
Recent haemodialysis trial results	• NightLife’s underpowered primary quality-of-life result was inconclusive; exploratory secondary findings require confirmation. • Supplementation with Omega-3 polyunsaturated fatty acid reduced serious cardiovascular events, but implementation requires cost, acceptability, sustainability and safety evaluation. • The PHOSPHATE Trial tests whether intensive phosphate lowering improves cardiovascular outcomes; current trial challenges include achieving adequate separation of serum phosphate between trial arms; results are expected in 2028.
Research design and inclusive practice	• Inclusive research design is now a requirement of the National Institute for Health and Care Research (NIHR) and should be embedded throughout the research lifecycle. • Dialysis patients remain excluded from most clinical trials, and inclusion should become the default approach. • Innovative trial methodologies including cluster randomisation, multi-arm multi-stage (MAMS) trials, and greater use of routinely collected healthcare data, including the UK Renal Registry and Hospital Episode Statistics, can improve efficiency, reduce participant burden, and support larger pragmatic studies.
Research prioritisation	• The James Lind Alliance process is being used to establish UK dialysis research priorities aligned with patients, carers, and clinicians. • Researchers are encouraged to engage with the Dialysis Research Innovation Network prioritisation process. Greater emphasis is needed on quality of life, rehabilitation, and patient-centred outcomes.
Innovations in dialysis technology	• Portable and wearable HD technologies are advancing, enabled by sorbent-based dialysate regeneration. • Implantable and bioartificial kidney technologies represent longer-term innovations, with regulatory frameworks now emerging. • AI-supported haemodynamic monitoring may improve dialysis safety, although patient-centred co-design remains essential. • Xenotransplantation remains experimental, with immune suppression as the main challenge.
Mentoring and Career Development	• Mentorship, coaching, and early-career research support are important across professional groups. • Future research depends on nurturing research leaders of tomorrow; NIHR schemes such as the Associate PI Programme help introduce healthcare professionals from all backgrounds into research.

Abbreviations: AI, artificial intelligence; DRIN, Dialysis Research Innovation Network; HD, haemodialysis; MAMS, multi-arm multi-stage; PI, Principal Investigator

for anticipated crossover; the ratio was later changed to 1:1.

Successful separation of treatment groups was demonstrated: INHD participants received a mean of 6.61 (SD 1.13) hours per session versus 4.07 (0.38) hours in

the daytime arm (adjusted mean difference 2.57 h, 95% CI 2.25–2.89, $p < 0.001$). The adjusted mean difference in KDQoL total score was 3.00 points (95% CI -12.4 to 18.3; $p = 0.702$). With only 100 participants randomised, the study was underpowered and the primary result therefore inconclusive.

Detailed findings concerning cognition, biochemical outcomes, medication use, age-defined subgroups and other secondary outcomes are being prepared for separate peer-reviewed publication and are therefore not reported here but have generated clinically meaningful hypotheses. Safety data were available for 89 participants: 14/48 (29.2%) in the INHD group and 10/41 (24.4%) in the daytime group experienced at least one serious adverse event; no formal comparison was pre-specified. Two events, both with INHD, were considered possibly intervention-related.

Professor Burton concluded that, while the NightLife Trial was inconclusive owing to underpowering, NightLife demonstrated the feasibility of delivering substantially longer in-centre sessions. Discussion at the meeting highlighted the potential role of INHD as a component of a diverse dialysis service offering patient choice and flexibility.

Omega-3 polyunsaturated fatty acid supplementation and cardiovascular outcomes: the PISCES Trial

Professor Charles Ferro presented the results of the Protection against Incidences of Serious Cardiovascular Events (PISCES) Trial [14]. Cardiovascular mortality is the leading cause of death in HD patients, and multiple trials of conventional cardiovascular therapies, including statins, cinacalcet, and normalisation of haemoglobin, have failed to reduce mortality in this population [15]. HD patients consistently display low circulating omega-3 polyunsaturated fatty acid (PUFA) levels, and mechanistic data support wide-ranging pleiotropic cardiovascular benefits of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) supplementation [15].

PISCES was a multicentre, randomised, double-blind, placebo-controlled trial at 26 centres in Canada and Australia, enrolling 1,228 adults receiving maintenance HD. Participants received fish oil providing 4 g/day n-3 polyunsaturated fatty acids (1.6 g EPA and 0.8 g DHA) or corn-oil placebo for a median 3.5 years. The primary endpoint comprised sudden and non-sudden cardiac death, fatal and non-fatal myocardial infarction, fatal and non-fatal stroke, and peripheral vascular disease leading to amputation. Serious cardiovascular-event rates were 0.31 versus 0.61 per 1,000 patient-days (hazard ratio 0.57, 95% CI 0.47–0.70; $p < 0.001$), while there was no clear reduction in all-cause mortality (HR 0.89, 95% CI 0.73–1.01). The composite of a first cardiovascular event or death

Table 2 Overview of haemodialysis research challenges, strengths and proposed next steps

Barrier	Potential response	Anticipated outcomes and endpoints
Limited research-ready capacity and variable unit culture	- Protected multidisciplinary research time. - Better networked NHS and independent-provider units. - Registry-enabled follow-up.	- Better recruitment reach leading to improved participant representation and external validity. - Shorter time to site opening. - Improved study retention.
Participant burden and restrictive eligibility	- Default-inclusive criteria. - Decentralised/local visits. - Proportionate consent and governance.	- Reduced participant burden. - Better inclusivity for participation. - Lower numbers of missed sessions and improved patient-reported experience.
Fragmented questions and small trials	- Cluster trials for unit policies. - Platform/MAMS infrastructure. - More international collaboration.	Concentrate on and routinely include priority outcomes for dialysis patients (SONG-HD) [39]
Implementation and affordability gaps	- Prospective health economics. - Co-designed solutions with patients and carers. - Local champions. - Well defined audit and feedback.	- Cost-effectiveness data to enable policy change. - Stronger local pathways to adoption. - Assessment of research impact for commissioners and funders.
Incomplete linked-data access	Linkage of the UK Renal Registry, Hospital Episode Statistics and other UK / International Health Registries with transparent governance.	- Access to robust data for hard clinical endpoints and prioritised outcomes. - Better access to long-term safety data.

Abbreviations: MAMS, multi-arm multi-stage; SONG-HD, Standardised Outcomes in Nephrology – Haemodialysis

from any cause was also lower (HR 0.73, 95% CI 0.61–0.87) [14].

Delegates recognised that PISCES is a single trial and discussed implementation barriers: the 4 g/day dose implies substantial capsule burden; NHS acquisition cost varies by formulation and no reliable cost estimate has been established; acceptability and sustainability of marine supply require evaluation; and the accompanying editorial highlighted small numerical imbalances in infection and respiratory events, as well as signals of higher non-cardiac mortality observed in some prior omega-3 PUFA trials in the general population [16]. Given the favourable cardiovascular signal observed, post-market observational surveillance should assess uptake, adherence, tolerability and clinical outcomes in routine haemodialysis care, complemented by health-economic modelling to determine whether the potential benefits of omega-3 PUFA supplementation justify its capsule burden and cost to the NHS. The meeting considered the result important enough for urgent evaluation by guideline groups while emphasising pharmacoeconomic analysis, replication and safety surveillance.

Phosphate management in dialysis: the PHOSPHATE Trial

Dr. Rona Smith presented an update on the PHOSPHATE Trial (NCT03573089; sponsor identifier AKTN 17.02), a pragmatic international RCT comparing intensive phosphate control (target serum phosphate ≤ 1.50 mmol/L) with a liberal strategy targeting 2.0–2.5 mmol/L. The intensive strategy is broadly consistent with KDIGO's suggestion to lower elevated phosphate towards the normal range, although KDIGO specifies no 1.50 mmol/L target [17]. However, high-quality evidence that actively reducing phosphate improves patient-centred outcomes

is absent, whilst phosphate binders impose significant pill burden, adverse effects, and cost.

PHOSPHATE has a primary composite endpoint of time to cardiovascular death, non-fatal myocardial infarction, coronary revascularisation, stroke, or peripheral arterial event, with maximal use of routinely collected healthcare data for outcome ascertainment. Planned enrolment is approximately 3600 participants, as of 1st May 2026, 3,623 patients have been enrolled across nine countries (Australia, Brazil, Canada, France, Israel, New Zealand, Thailand, Singapore, and the UK), including 907 UK participants. The achieved phosphate separation is 0.26 mmol/L globally and 0.21 mmol/L in UK sites. With 672 of the target 1,190 adjudicated primary endpoint events accrued, recruitment continues until 31st December 2026, with follow-up for a further 12-months and results anticipated in 2028. The figures included are unpublished data presented at the meeting.

Ongoing UK haemodialysis studies and recruitment performance

Professor David Wheeler presented a descriptive analysis of haemodialysis-related studies recorded in the NIHR Central Portfolio Management System (CPMS) [18]. The NIHR Open Data Platform (registration required) enables analysis of all studies supported on the RDN Portfolio, including participant recruitment, and displays information from CPMS, which is updated every 24 h. An export generated on 22nd May 2026 contained 121 unique studies, with opening dates ranging from January 2009 to September 2024. Of these, 98 were classified as non-commercial and 23 as commercial. The CPMS activity categories comprised 57 observational studies, 34 interventional studies, one large interventional

study and 29 commercial studies. Recruitment totalled 35,852 participants across England, Scotland, Wales, and Northern Ireland, at a national per-capita rate of 0.5 per 1,000 population. Marked regional variation was evident: South London, North London, West Midlands, and Yorkshire and Humber led in per-capita recruitment (0.8–0.9/1,000), whilst Northern Ireland (0.1/1,000), Scotland (0.2/1,000), and Wales (0.2/1,000) lagged substantially, potentially impacting on the generalisability and ultimate implementation of research findings into clinical findings due to regional variations in care pathways and resources. Four studies were listed as open to recruitment at the time of the export: PHOSPHATE, PAVE-2 (ISRCTN40182296), CONFIRM (NCT03586518), and a paediatric study of etelcalcetide in children receiving haemodialysis; recently completed programmes include RESOLVE (NCT02823821), SIMPLIFIED (ISRCTN15087616), and H4RT (ISRCTN10997319). Professor Wheeler emphasised that these trials represent a remarkable platform of UK dialysis research capability that must be sustained and developed. These portfolio figures derive from an unpublished analysis presented at the meeting, based on a CPMS export generated on 22 May 2026.

Please note that all public study information detailed above is available through the NIHR ‘Be Part of Research service’ [19].

Innovations in dialysis technology

Portable, wearable, and implantable kidney replacement therapies

Professor Fokko Wieringa delivered a keynote review of the landscape of technology-based kidney replacement therapies (KRT). Conventional in-centre HD delivered thrice weekly effectively tethers patients to clinical settings for approximately 156 treatment sessions each year, severely constraining lifestyle, employment, and wellbeing. Portable and wearable HD systems achieve miniaturisation by recycling a small volume of dialysate through sorbent-based regeneration; several devices are in advanced development, supported by programmes such as the EU HORIZON-funded KIDNEW project, and the Dutch national growth funds’ NXTGEN Hightech Biomed04 project. Both are advancing silicon chip-based dialyser technology, miniaturised electronics-on-chip, wireless charging, and integrated telehealth connectivity.

Beyond extracorporeal miniaturisation, Professor Wieringa also reviewed partially as well as fully implantable approaches, including an implantable silicon nanopore haemofilter system using the patient’s own heart as the blood pump, combined with a miniaturised extracorporeal dialysate implantable bioartificial kidney concept [20]. Pairing such silicon nanopore filtration membranes with an additional bioreactor containing renal tubular

cells, would eliminate dialysate entirely and drain ultrafiltrate to the bladder [21]. Three-day pre-clinical porcine studies demonstrated filtration by the haemofilter, 93% reabsorption by the renal-cell bioreactor and cell viability exceeding 95%. In September 2025, ISO commenced an International Technical Specification for implantable haemodialysis filters [22], an international standardisation milestone signalling that the field is preparing to transition from concept to clinical translation. An update on renal xenotransplantation highlighted the continuing immunological barriers to gene-edited porcine kidney transplantation. These include cellular adaptive immune responses mediated by T lymphocytes and humoral rejection driven by pre-existing or newly formed antibodies against porcine antigens, with consequent complement activation, endothelial injury and thrombotic microangiopathy. Innate immune pathways may also contribute. Current immunosuppressive regimens directed principally at adaptive immunity may therefore be insufficient to prevent xenograft injury and failure, reinforcing the need both for broader immunological strategies and for continued development of haemodialysis technologies [23].

Artificial intelligence in dialysis monitoring

Professor Andrew Davenport reviewed approaches to reducing intradialytic hypotension (IDH), the reported frequency of which varies substantially according to the definition used. Existing evidence includes blood-volume-monitoring-guided ultrafiltration biofeedback and thermocontrolled haemodialysis, which aim to improve haemodynamic stability during treatment [24–26]. These approaches respond to physiological measurements obtained during dialysis but should not be described as machine-learning prediction models. Artificial intelligence and machine-learning methods may eventually support earlier identification of impending IDH, but their discrimination, calibration, prediction horizon and clinical utility require prospective external validation before they can be recommended for routine care. Professor Davenport emphasised that any such systems should be co-designed with patients and clinicians to ensure that their outputs are interpretable and actionable.

Research design and funding in 2026

Embedding diversity and inclusion in research

Dr. Rebecca Barnes outlined NIHR’s new requirements for inclusive research, which now constitute explicit funding conditions for domestic awards since November 2024 and global awards since April 2026, including costed inclusive design across the full research lifecycle [27]. A new NIHR Sex and Gender in Research Policy (applicable from November 2025) additionally requires sex, gender, or both to be accounted for throughout all

research stages [28]. Dr. Barnes highlighted that dialysis researchers are particularly well-positioned to champion inclusion, given the disproportionate burden of kidney failure in Black and South Asian communities, groups systematically underrepresented in clinical trials.

Trial design in the dialysis setting

Dr. Rona Smith reviewed the PICO framework and a default-inclusive approach. Exclusions may remain necessary when an intervention poses a specific safety risk, when consent cannot be obtained through an ethically appropriate process, or when treatment delivery or outcome ascertainment is genuinely infeasible; these reasons should be explicit rather than inferred from dialysis status. Examples included cluster randomisation of unit-level policies (such as dialysate sodium in RESOLVE; NCT02823821), decentralised recruitment or local follow-up to reduce travel and improve recruitment and retention [29], a future MAMS platform evaluating several dialysis interventions with interim stopping rules, and target-trial emulation using registry or linked health-record data when randomisation is unavailable. Each design carries risks of contamination, selection bias, confounding or infrastructure burden and does not substitute for a well-conducted individual RCT where that is feasible.

Haemodialysis research priority setting

Professor Mark Lambie presented an ongoing Dialysis Research Innovation Network (DRIN) priority-setting partnership informed by James Lind Alliance (JLA) methods [30], the first such exercise focused specifically on UK dialysis priorities. The process gathers uncertainties from patients, carers and professionals; checks them against existing evidence; groups and verifies questions; and uses interim and final prioritisation to agree a shared top ten. A systematic literature search (2,646 articles screened; 266 systematic reviews retained) has mapped the evidence base (unpublished data presented at the meeting). At the time of the meeting, interim figures presented revealed that 40 stakeholder responses had generated 205 unique research questions, spanning topics from dietary interventions for fatigue to optimal session parameters for haemodynamic stability. The denominator and response rate, and the breakdown of respondents by stakeholder group, including patients and carers, were not available at the time of this report. These figures therefore represent a small interim sample and should not be interpreted as the final prioritisation outcome. Subsequent JLA stages will include further uncertainty gathering, evidence checking, grouping and verification, followed by interim and final prioritisation to establish a shared top-10 priority list, on which a national research strategy will be developed.

Grant writing: what makes and breaks an application

Professor James Burton, as Deputy Chair of the NIHR EME Programme Panel, emphasised: matching ambition to funding mechanism; securing proof of concept before large trial funding; embedding patient and public involvement and engagement (PPIE), equality, diversity and inclusion (EDI), and knowledge mobilisation from the outset; and always foregrounding patient benefit.

Career development and knowledge mobilisation

Navigating a research career in nephrology

Professor David Wheeler chaired an interactive workshop on research career development, facilitating discussion of structural barriers including protected research time, grant-dependent job insecurity, and limited awareness of available pathways. Resources highlighted included NIHR Academic Clinical Fellowships, R&D department support, the Dialysis Research Innovation Network, and external funding through Kidney Research UK and the Academy of Medical Sciences.

Knowledge mobilisation and impact

Professor Sunil Bhandari used the PIVOTAL trial of proactive intravenous iron therapy [31] as a case study in the gap between evidence generation and implementation, illustrating that both the UK Kidney Association anaemia guideline [32] and full NICE-endorsed protocol adoption remains incomplete in many UK HD units due to clinical inertia, guideline fatigue, and resource constraints [33]. The presentation cited UK analyses estimating that public and charitable medical research yields combined health and economic returns equivalent to about £0.25 per £1 invested annually in perpetuity [34]. Professor Bhandari emphasised that knowledge mobilisation should be planned from the outset through education, local champions, audit and governance.

The importance of mentorship and coaching

Ms. Clare Morlidge discussed mentoring, which often draws on shared or lived experience, and distinguished it from coaching, which uses structured facilitation irrespective of shared experience. Both are valuable at all career stages. Peer mentoring was highlighted as particularly accessible, and delegates were encouraged to seek and offer mentoring relationships proactively across all professional disciplines.

Early career investigator presentation

Arteriovenous fistula stenosis: risk factors and patient perspectives — a sequential mixed-methods study

Sarah McMillan presented a sequential mixed-methods PhD project examining risk factors for and patient experiences of AVF stenosis. The AVF remains the recommended vascular access modality for maintenance HD

Haemodialysis Research: Challenges, Successes and Next Steps

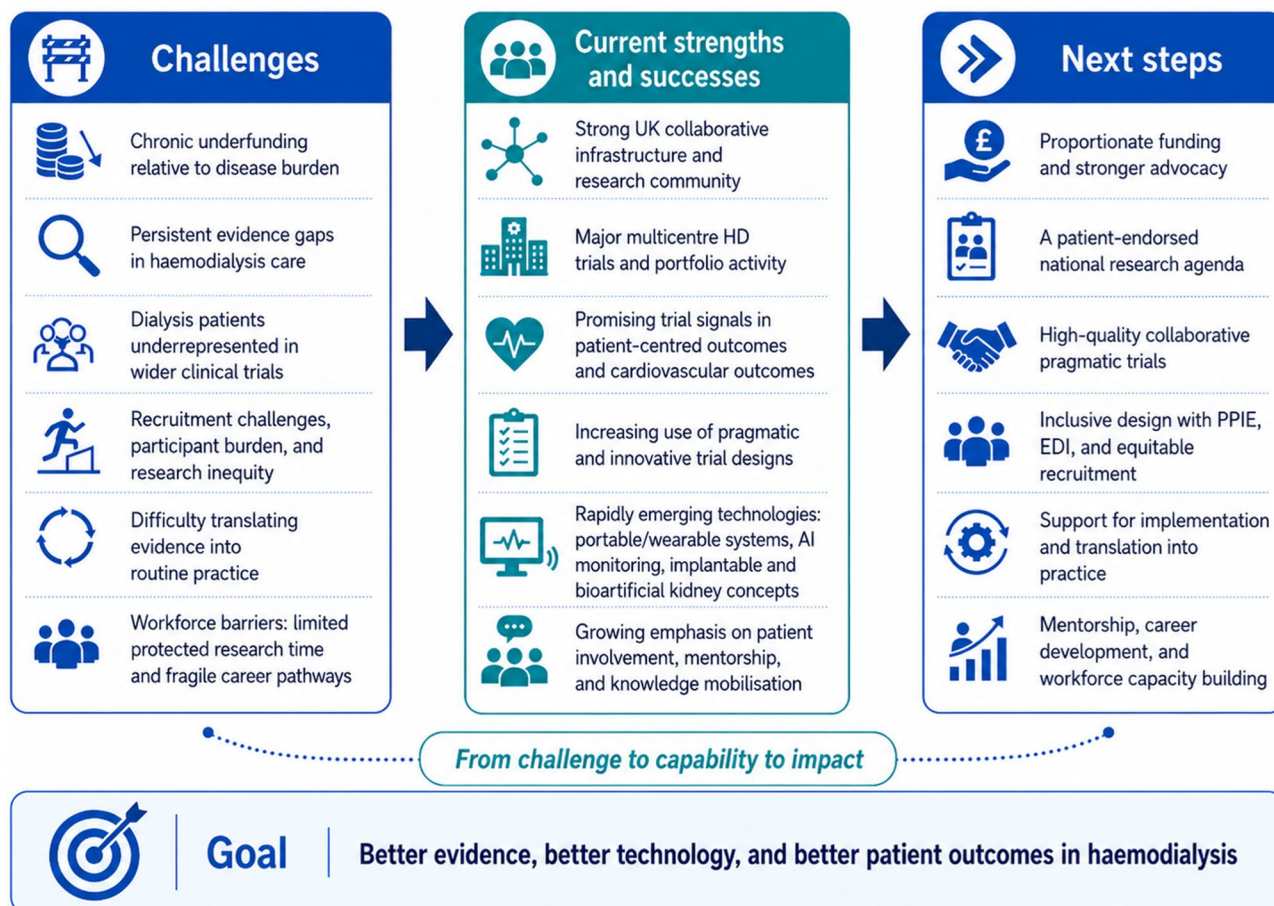


Fig. 1 Author created overview of haemodialysis research challenges, current strengths and successes, and proposed next steps. The figure contains three linked domains: current challenges, existing strengths and successes, and proposed actions for the UK haemodialysis research community. Abbreviations: AI, artificial intelligence; EDI, equality, diversity and inclusion; PPIE, patient and public involvement and engagement; UK, United Kingdom

[35] due to its reduced rates of complications. Yet stenosis is common and can profoundly affect patients' quality of life and psychological wellbeing [36, 37]; during the presentation, it was noted that fear and anxiety about vascular-access complications have been described but remain incompletely explored.

The study design incorporates: (i) a JBI scoping review of clinical risk factors and patient perspectives on stenosis and access loss; (ii) secondary analysis of a large clinical dataset; and (iii) semi-structured qualitative interviews. A Study Management Group including two individuals with lived experience of access complications has been established.

Discussion and conclusions

The inaugural United Kingdom Haemodialysis Research Nexus demonstrated the breadth of contemporary HD research while exposing persistent limits in funding, trial capacity and implementation. These proceedings report

presentations and discussion; they are not a formal guideline or consensus generated by a predefined voting method.

Across clinical trials, technological innovation, methodological reform, and workforce development, the meeting highlighted a field undergoing significant transformation while continuing to face substantial structural challenges (see Fig. 1).

Three implications emerged. First, trials should measure outcomes that matter to patients - cognition, fatigue, treatment burden, rehabilitation, participation and quality of life - alongside mortality and biochemistry. Second, a stronger trial ecosystem requires research-ready dialysis units, protected multidisciplinary time, proportionate governance, inclusive eligibility, registry-enabled follow-up and partnerships spanning NHS and independent providers. Third, innovation must be evaluated for usability, equity, safety, cost and implementation rather than technical performance alone. High-volume

haemodiafiltration was identified in the portfolio presentation, including a proposed UK registry trial, but the meeting did not undertake a detailed review of current implementation or treatment-effect heterogeneity; this remains an important research question.

The meeting also reinforced the importance of the structural foundations underpinning successful research ecosystems. Inclusive research design, patient and public involvement, mentorship, knowledge mobilisation, and coordinated research prioritisation were consistently identified as essential components of high-quality haemodialysis research rather than optional additions. Despite advances, haemodialysis research remains profoundly underfunded relative to disease burden. Kidney disease affects approximately 850 million people worldwide and imposes major economic costs on healthcare systems and wider society, yet investment in kidney research remains substantially lower than that directed towards many other chronic diseases. This imbalance contributes to persistent evidence gaps, slower translation of innovation, and reduced research capacity.

International comparison can strengthen this agenda. Dialysis Outcomes and Practice Patterns (DOPPS) data and national registries enable comparison of practice and outcomes [38], while UK Renal Registry linkage with Hospital Episode Statistics and other routinely collected records can reduce follow-up burden. UK Biobank may support mechanistic and population research but contains relatively few people receiving maintenance HD and is not a substitute for dialysis-specific cohorts. Cost comparison requires harmonised resource-use definitions and prospective economic evaluation; the meeting did not present comparable international cost data.

In this context, the United Kingdom Dialysis Research Prioritisation Exercise represents more than a methodological exercise: by aligning future research agendas with the priorities of patients, care partners and clinicians, it provides an important framework for advocacy, funding decisions and strategic coordination across the haemodialysis research community. People with lived experience of haemodialysis participated in the meeting and contributed to discussions informing these priorities, helping to maintain a focus on treatment burden, quality of life, acceptability and equitable access to research. Nevertheless, patient and public involvement was limited to a relatively small number of contributors and was not an independently facilitated priority-setting exercise. Future Nexus activities should involve a larger and more diverse group of patients and care partners throughout agenda setting, priority development, study design and dissemination. The principal barriers to delivering this patient-centred research agenda, together with proposed responses, are summarised in Table 2.

The challenge is to convert collaborative infrastructure, patient priorities and sustained investment into reliable and equitable improvements in care. Progress will require adequately powered trials, transparent reporting of unpublished meeting data, international collaboration and planned knowledge mobilisation to ensure timely implementation of important clinical outcomes.

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Author contributions

SH and JOB conceived and drafted the report. RB, SB, AD, CJF, ML, SM, CM, RS, DCW and FPW contributed the content and verification of their respective sessions. All authors contributed to interpretation, critically revised the manuscript and approved the submitted version.

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Data availability

No datasets were generated or analysed during the current study.

Declaration

Ethical approval and consent to participate

This article reports an academic meeting and did not involve a research intervention or systematic collection of identifiable participant data. Sessions were not audio- or video-recorded for this report. The authors used contemporaneous slides and notes.

Consent for publication

Not applicable. No identifiable individual information is published.

Competing interests

SH is Chair of the Kidney Research UK Clinical Study Group for CKD associated Mineral Bone Disorders. SB is Vice President of the Royal College of Physicians of Edinburgh and former Trustee of Kidney Research UK. CF is Vice-Chair of the Cardiovascular Medicine Working Group and Chair of the Strong Kidneys Task Force of the European Renal Association. ML is Co-Chair of both the UK Kidney Association Home Therapies Special Interest Group and Kidney Research UK Dialysis Research Innovation Network. CM is a Trustee and Former President of the UK Kidney Association. RS is the Chief Investigator of the NIHR funded PHOSPHATE Trial and Deputy Chair of the Kidney Research UK Renal Trials Network. DW is the NIHR National Specialty Lead for Renal Disorders. FPW received financial support from the European Innovation Council (KIDNEW, HORIZON-EIC-2022 Pathfinder program, grant agreement no. 101099092), as well as from the Dutch national growth fund (NXTGEN HighTech Biomed04 "Artificial Organs" project) and is a technology consultant to NextKidney. JOB is funded (Senior Investigator Award) by the National Institute for Health and Care Research (NIHR). The views expressed in this article are those of the author(s) and not necessarily those of the NIHR, or the Department of Health and Social Care. He is Clinical Vice-President and a Trustee of the UK Kidney Association. RB and SM declare no relevant competing interests.

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