THL1

Reduction in dialysate flow rate to reduce environmental impact: a single centre quality improvement project

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THURSDAY - Moderated Poster Session, HALL Q, March 12, 2026, 10:00 - 11:00

Introduction

Haemodialysis is resource-intensive treatment with high water and energy requirement. Higher dialysate flow (Qd) has been shown to increase urea-based markers of dialysis adequacy. However, meta-analysis shows that increasing Qd from 500ml/min to 800ml/min only increases single-pool Kt/V by 0.08 with unclear clinical relevance (Iman et al, CKJ 2024). Adjusting dialysate flow will reduce water consumption and the environmental impact of haemodialysis. We report a quality improvement project, in which the default Qd was reduced for patients in a single dialysis unit. The clinical impact on dialysis parameters and patient reported outcomes was assessed.

Methods

A quality improvement project was undertaken in a renal unit comprising 55 dialysis stations. Default Qd was reduced from 750ml/min to 500ml/min for all patients. Patient demographics, comorbidities, weight, single pool KT/V and blood test results were collected from the local renal database in the week prior to the change and at 3 months. Health Related Quality of Life (HRQoL) was assessed using the EQ-5D-5L visual analogue score (VAS) (maximum score=100).
Analysis was conducted using SPSS V29. Descriptive data are presented as mean±SD if parametric, median [IQR] if non-parametric or number (%). Paired samples were tested for significance with paired T test if parametric and McNemar's test if dichotomous.

Results

287 patients received in-centre haemodialysis and were included in this analysis. The mean age of the cohort was 63.8±15.1 years, 182 (63.4%) were male and median dialysis vintage was 32 [14-63] months. 144 (50.2%) of the cohort had type1 or type 2 diabetes mellitus and 87 (30.3%) had cardiovascular disease. Mean effective blood flow rate (Qb) was 350±62 ml/min, and 170 (59%) had a Qb of at least 350ml/min. 14 individuals stopped dialysing during the 3-month period and were not included in subsequent analysis (7 died, 4 transferred units, 1 had a transplant and 2 chose to move to conservative care).
Mean single pool Kt/V was not significantly different after the reduction in dialysate flow rate. Prior to the reduction, mean single pool Kt/V of the patient cohort was 1.31± 0.27 and at 3 months it was 1.30±0.25, p=0.7. The number of patients with Kt/V of greater than or equal to 1.2 was 197 (72%) at baseline and 188 (69%) at 3 months, p=0.5.

Similarly, the patient reported outcome measure for overall HRQoL did not significantly change; mean overall patient reported EQ-5D-5L VAS was 62.5±25.1 at baseline and 61.9±26.2 at 3 months, p=0.7.
The monthly estimated water consumption at Qd 750ml/min was 671,580 L and at Qd 500ml/min was 447,720 L. The estimated monthly reduction in water consumption is therefore 223,860 L.

Conclusions
A planned decrease in Qd, intended to reduce water consumption, has not had a significant impact on dialysis clearance or patient reported quality of life. Further detail is awaited from additional analyses, including the impact of effective Qb and the change in other resource consumption.
Adjusting dialysate flow rate could be an effective way of reducing the environmental impact of haemodialysis while maintaining equivalent levels of clinical care and patient experience.

THL2

Renal Patients' Perspectives on Medication Supply, Prescription Management, and Waste Reduction Strategies

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Introduction
Patients with kidney disease often manage complex medication regimens across multiple care settings, including dialysis units, transplant clinics, and primary care. Frequent dose adjustments, fragmented communication, and inconsistent prescription processes contribute to medicines waste, patient frustration, and environmental impact. Despite national efforts to reduce pharmaceutical waste, patient perspectives on supply and disposal remain underexplored. This quality improvement (QI) project aimed to understand renal patients' experiences of medication supply and prescription management, and to co-design practical strategies for reducing waste and improving continuity of care.
Methods
A patient listening event was held in April 2025, involving individuals with lived experience of dialysis and kidney transplantation. Participants were recruited via renal patient networks and contributed through semi-structured online discussions. Thematic analysis was used to identify key challenges and opportunities. Insights informed a series of targeted interventions, including: (1) education on using the NHS App for prescription tracking and ordering, (2) revised discharge protocols to prevent duplicate supplies, (3) pilot recycling schemes for medication packaging, and (4) staff training on sustainable prescribing. Patient quotes were anonymised and used to guide service redesign. Feedback was collected throughout the process to ensure interventions remained patient-centred and feasible within existing systems.
Results
Patients described frequent wastage during post-transplant dose titration, often receiving excess supplies due to delayed communication between hospital, clinic, and GP systems. Discharge processes were highlighted as a key failure point, with patients unsure how to manage changes or where to return unused medicines. Thematic analysis revealed three priority areas: (1) digital enablement to support prescription management, (2) improved communication across care transitions, and (3) access to environmentally responsible disposal options. Patients expressed a desire for clearer guidance, more joined-up systems, and opportunities to contribute to sustainability efforts. The listening event also surfaced emotional responses—frustration, guilt, and confusion—linked to medicines waste and lack of agency in managing prescriptions.
Discussion
This project demonstrates the value of patient-led insights in shaping sustainable improvements to medication supply in renal care. While no quantitative data were collected at this stage, the qualitative findings offer rich, actionable perspectives that have informed a series of co-designed interventions. These changes aim to reduce waste, improve patient experience, and support environmental goals. Sustainability is being embedded through staff education, digital tools, and alignment with NHS net zero ambitions. The approach is

transferable to other long-term condition pathways where polypharmacy and care fragmentation are common. Key enablers included multidisciplinary collaboration, patient storytelling, and practical feedback loops. Next steps include piloting the proposed interventions, evaluating their impact, and exploring opportunities to scale and spread successful strategies across renal services and beyond.

THL3

One Culture Too Many? Rethinking Universal Containers in Peritoneal Dialysis Peritonitis: a service evaluation project

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THURSDAY - Moderated Poster Session, HALL Q, March 12, 2026, 10:00 - 11:00

Background

Peritoneal dialysis (PD) is a treatment for end-stage renal failure. A recognised complication is peritonitis (PDP), which may arise from contamination or intra-abdominal sources.
For diagnosis, the International Society for Peritoneal Dialysis recommends collecting PD fluid for cell count, Gram stain, and culture, with blood culture (BC) bottles as the preferred method. The UK Standards for Microbiology Investigations also advise collecting an additional specimen, usually in a universal container (UC), for microscopy and direct culture.
A service evaluation compared results between culture methods. Of 81 episodes of PDP, 77 had growth detected by BC either earlier or on the same day as UC. This project aimed to calculate the potential cost savings of discontinuing UC cultures by evaluating laboratory resources, staff time, and consumable costs.

Methods

Staff wages were calculated using NHS Employers' pay scales for 2025/26, based on Biomedical Support Workers (Band 3) and Biomedical Scientists (Band 6). Hourly rates were converted to a per-minute rate, multiplied by the time required per sample to determine labour cost.
Laboratory time was derived from the Trust Standard Operating Procedures. Processing UC samples for culture and Gram stain was estimated at 35–40 minutes. Consumable costs were obtained from pathology procurement data.
Annual labour costs were calculated using the average number of PDP cases per year (21.75).

Results

The total annual labour cost of processing UC samples was estimated at £185.97–£203.58, compared with £4.57–£4.78 for BC bottles.
Consumable costs for UC samples were estimated at £0.74 per sample, equating to £16.10 per year.

Discussion and Conclusion

Omitting UC cultures saves laboratory resources and staff time with minimal risk of missing a positive result. The change also reduces consumables, supporting more sustainable practice. In addition, the BC method requires fewer processing steps, simplifying workflows and reducing contamination risk.
Gram staining of PD fluid continues. Inoculated BC bottles are incubated for 10 days to ensure detection of slower-growing organisms such as yeasts.

THL4

Sustainability in Haemodialysis- Maximizing haemodialysis machines functionalities to reduce clinical waste

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THURSDAY - Moderated Poster Session, HALL Q, March 12, 2026, 10:00 - 11:00

Climate change poses a major threat to our health as well as our planet [1]. The environment is changing, that change is accelerating and this has direct and immediate consequences for our patients, the public and the NHS. In England the NHS accounts for 4% of the country's greenhouse gas (GHG) emissions and 5% of these are attributed to Clinical Waste [2]. For frequent treatments such as haemodialysis, small environmental and cost savings per treatment can equate to considerably greater savings in the long term.
Our Trust currently uses several dialysis machines from two manufacturers. Whilst some of the dialysis machines have this function as a pre-built option, the monitors we have used for this project require an extra procedure to be followed by staff, therefore training and staff's commitment was paramount in delivering the results.
To enable application of the data to any other dialysis services we have chosen to evaluate the impact of the initiative in an 18-bedded haemodialysis unit operating 3 shifts per day, six days per week. The project was initiated after the old dialysis machines were replaced with newer models of HD monitors that facilitates complete drainage of the extracorporeal circuit at the end of the treatment. This reduces the residual volume and weight of the disposed circuit, classified as clinical waste.
The initiative was measured monthly, with an evaluation at three months demonstrating an average reduction of 400 gram per treatment. Whilst this may appear insignificant, it corresponds to a saving of 5.2 kg per patient per month. For the Trust alone, which provides regular dialysis treatment for approximately 700 patients (as of July 2025), this equates to a total reduction of 3.7 tonnes per month. Annually, this amounts to an estimated reduction of approximately 13 tonnes Co2e and the financial savings exceeding £16k, based on the Trust current incurred charges of £333-£420 per ton of clinical waste. [3]
As the haemodialysis services contribute towards helping the NHS reach the Net Zero goal set by the UK government, initiatives such as this should be supported and encouraged in all haemodialysis units across the country.

References:
[1] World Health Organisation : Climate change and human health, 2022. Available at: https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health
[2] Greener NHS » Delivering a net zero NHS (England.nhs.uk)
[3] Billing invoices SharpsSmart

THL5

Trying to reduce carbon emissions by empowering in-centre haemodialysis patients to bring their own blankets and cups

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Our unit has partnered with Kidney Quality Improvement Partnership (KQIP) and the regional sustainable QI initiative, Trying to Reduce UnNecessary Carbon from Haemodialysis (TRUNC-HD) to reduce the carbon emissions of our in-centre haemodialysis unit. Unit-provided blankets are washed after every use, and promoting the use of personal blankets helps decrease the frequency of blanket washing, thereby reducing environmental impact. Additionally, with the UK generating 2.5 billion discarded coffee cups annually, of which less than 1 in 400 are recycled, this initiative aimed to address this waste by encouraging reusable cups and represents a practical QI measure within the unit's capacity to implement.

Project leads were identified and attended four KQIP local QI face-to-face workshops following the KQIP QI methodology (Image 1) and two Y&H TRUNC_HD regional sharing and learning meetings over the year. QI tools utilised included stakeholder analysis, process mapping to highlight the potential challenges and change ideas, development of a driver diagram showcasing the project on a page. A patient survey was developed to gain understanding of patients' thoughts on the potential change providing baseline data. This was distributed to all patients on the units, providing some information on the project and had three questions (Image 2). After the survey, patients were encouraged to bring their own blankets and cups.

Out of the 80 patients surveyed, all responses were positive. 100% of patients stated that they felt they could bring their own blanket and that they understood the reasons. No written comments were submitted. However, verbally 3 patients stated they did not have a blanket to bring to the unit and a further 2 patients stated they would not be providing their own blanket due to feeling the change was financially motivated and inconvenient for them.

This initiative reduced the number of blankets and cups ordered per week in a satellite dialysis unit from 180 to 50 and from 200 to 60 respectively saving an estimated of 1.4 to 1.7 tonnes of carbon dioxide equivalent emissions (CO2e).

This case study highlights how patient involvement can drive small but impactful changes. While environmental savings were challenging to quantify due to variations in life cycle analyses of blankets and cups, the estimated reductions demonstrate potential benefits. Initial barriers included perceptions of staff and patients that environmental savings were not their responsibility, concerns about limited impact, and fears that this was a cost-cutting exercise. However, positive patient responses and staff encouragement and determination gradually improved engagement. The project raised awareness of carbon reduction strategies, provided insights into KQIP methodology, and gained recognition, with an

opportunity to present at the November 2024 YHKN event. Plans are underway to expand the initiative across other units within the organisation and the region. Moving forward, to encourage the improvement work to be sustained and move it into a permanent change there are plans to source a welcome pack for patients which will include their own blanket and mug in re-usable bag with a small poster highlighting the project conducted.