


BMJ Open Quality **Implementing a multisite shared haemodialysis care programme**

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ABSTRACT

Adults receiving centre-based haemodialysis (HD) have low levels of patient activation which are associated with poorer outcomes. Shared haemodialysis care (SHC) describes an intervention whereby individuals are supported to undertake elements of their treatment to improve their activation levels and promote better self-care. This project aimed to increase the proportion of those performing SHC in seven HD centres within the Oxford Kidney Unit's catchment area. Sequential Plan-Do-Study-Act (PDSA) cycles effected change first in two central HD centres, in cycles 1 and 2, before rolling out to five satellite HD centres, in cycles 3 and 4. Cycle 1 explored and transformed staff perceptions regarding SHC using a questionnaire and teaching sessions while in cycle 2, staff partnered with patients to develop leaflets and noticeboards to improve awareness and participation. These interventions were then rolled out to the remaining HD centres in PDSA cycles 3 and 4. Other interventions included: Enrolling staff and patients in virtual training courses; designating SHC 'Champions'; engagement with a national SHC forum; and changes to the electronic patient record to enable the monitoring of patient SHC opportunity and to promote sustainable change. Outcome measurement data on the number of patients performing SHC and the number at different defined stages of SHC competency were captured monthly. In April 2022, only 4% (19/483) of those receiving centre-based HD performed any aspect of SHC. By the end of the project in December 2023, this had increased to 43% (220/511). There was a significant and sustained growth in the stage of patient SHC competency as well as the number of patients performing SHC in each HD centre. The project demonstrated that it is possible to implement, scale-up and maintain a multisite SHC programme even with little baseline staff and patient SHC experience.

PROBLEM

Haemodialysis (HD) is a treatment for people with end stage kidney failure (ESKF) that is often performed in a specialised centre, referred to as centre-based HD. Approximately 25 000 prevalent adults receive centre-based HD in the UK¹ where they usually attend three times a week for sessions that last 4 hours at a time. The component tasks required to complete an HD session are often performed by a member of the healthcare team with no input from the person receiving

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Supporting individuals to engage with shared haemodialysis care has been identified as a UK national priority but there is no established framework for implementation.

WHAT THIS STUDY ADDS

⇒ This project offers an example outside of a research setting whereby staff can partner with those receiving haemodialysis (HD) to promote their engagement with shared care.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This approach of promoting shared care is directly transferable to other HD providers not just within the UK but all over the world.

treatment. Centre-based HD can become a passive experience for those receiving care which contributes to demonstrably low levels of patient activation—an individual's readiness and willingness to manage their own healthcare—within these populations.²

In the UK, the National Health Service (NHS) provides universal free healthcare including dialysis treatments based on individual needs. As set out in the NHS Long Term Plan 2019, supporting self-management has been identified as a core strategy to offer more personalised care within England's healthcare service model.³ Aligning with this national objective, in 2021 the Getting It Right First Time programme—an NHS England initiative that runs clinically led reviews into healthcare services—published a report on renal medicine that recommended dialysis providers in England should offer shared haemodialysis care (SHC) within their HD centres.⁴ SHC is a patient-coined term that describes an intervention whereby a person receiving centre-based HD is educated and facilitated to self-manage aspects of their care during treatment sessions in order to develop their confidence, independence and improve their activation levels.⁵



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The Oxford Kidney Unit is a specialist kidney unit located in the UK offering centre-based HD treatment to people with ESKF via two HD centres centrally in Oxford with five additional satellite HD centres spread across an area extending 40 miles in radius from Oxford. Approximately 500 prevalent adults receive centre-based HD treatment via these centres with 2021 data suggesting that this population is predominantly white (74.6%) with a median age of 66 years.¹ Prior to project initiation, the Oxford Kidney Unit had no structured SHC programme and few adults were performing SHC across all seven HD centres. There was widespread variation regarding staff knowledge and awareness leading to inconsistencies in individual opportunity to engage with SHC.

With momentum following the national recommendations, the Oxford Kidney Unit determined in early 2022 that introducing an SHC programme would be a priority across all catchment HD centres. The primary aim of the project would be to increase the proportion of individuals performing SHC in these centres to over 20% of the total centre-based HD adult population within 18 months.

BACKGROUND

Patient activation is a behavioural concept defined as an individual's knowledge, skill and confidence for managing their health and healthcare.⁶ Combined with other important aspects such as access to resources or support, patient activation is a cornerstone of effective self-care.⁷ It has been well established that people with long-term health conditions including chronic kidney disease and other common comorbidities such as diabetes or heart failure are more likely to have low levels of activation.^{8,9} Among people with ESKF, those receiving centre-based HD have the lowest levels of activation compared with those receiving other treatment options.¹⁰

Addressing and improving activation levels has several proposed biopsychosocial benefits. It has been hypothesised and demonstrated that those receiving centre-based HD and engaging more with self-care are more likely to experience: Improved fluid management, phosphate control, reduced antihypertensive use, less interdialytic weight gain and improved physical functioning.^{11–14} Higher levels of individual knowledge of their kidney disease and treatment have been shown to be associated with improved mental health functioning¹⁴ while conversely lower activation levels correlate with higher levels of depression and anxiety.¹⁵

SHC aims to improve patient activation levels in an attempt to reap some of these benefits. The idea is to introduce shared care in a stepwise fashion at the pace of each person's choice and comfort, starting with simple tasks to build confidence and moving on to more complex in order for people to grow from being overwhelmed by their illness to achieving greater mastery and independence over their condition and treatment.⁵ SHC has also been viewed as a driver to enable people to transition to perform HD at home—a method which

can offer individuals more independence, convenience, has been associated with better clinical outcomes¹⁶ and is more cost-effective than centre-based HD.¹⁷ Results from the SHAREHD trial showed that initiatives to increase SHC led to an increase in the proportion of people performing home HD from 7.5% to 11.6% of the total HD cohort studied.¹⁸

An annual Patient Reported Experience Measure survey indicates that SHC is variably offered to adults in HD centres in the UK¹⁹ but there are no routinely collected validated data on the proportion of individuals performing SHC. Private entities that provide HD for NHS patients do offer SHC within their HD centres²⁰ but again data on the proportion of participating individuals is not publicly available.

There are many barriers to offering SHC. An individual may lack confidence or have a fear of procedural complexity.²¹ However, an individual's desire and ability to participate in their own treatment is often underestimated despite many being interested and perceiving themselves as capable of performing elements of their care.²² There are also often perceived relative contraindications to offering SHC, reflecting local capacity, capabilities and preferences.²³ Many of these issues can be overcome with flexible and supportive intervention. While there is no nationally agreed framework of how to implement an SHC programme, there are now resources including online tools available from the Sharing Haemodialysis Care Improving Outcomes collaborative²⁴ to assist with implementation.

MEASUREMENT

Outcome measures first required the determination of how individual SHC competency would be defined and assessed. The component tasks of an HD session were grouped into five broad stages (see [table 1](#)) which were agreed between all HD centre lead nurses. Individual competency would be assessed by a trained HD nurse who would evaluate against the same standards that a staff member would need to achieve in order to be deemed competent at each component task. Once assessed as competent, the staff member would update an SHC form (online supplemental 1) that would stay with the individual's HD notes indicating the date competencies were achieved with comments and other aspirational objectives. These forms were adapted for use from those developed by the Sharing Haemodialysis Care Improving Outcomes collaborative. There was some nuance to defining competency. For example, not every person can weigh themselves independently (if they require assistance to transfer to do so for instance) but they might be competent in performing all other aspects of stage 1 or be capable of tasks at a higher stage of competency. Such cases would be discussed in project meetings to ensure uniform definitions were being applied.

The primary outcome measure for the project would be the proportion of individuals performing any stage of

Table 1 Stages of shared haemodialysis care individual competency

Stage of SHC competency	Person can independently:
1	<ul style="list-style-type: none"> ▶ Measure their weight. ▶ Wash their hands. ▶ Measure their blood pressure.
2	<ul style="list-style-type: none"> ▶ Prepare their own dressing pack.
3	<ul style="list-style-type: none"> ▶ Line the haemodialysis machine.* ▶ Prime the haemodialysis machine.†
4	<ul style="list-style-type: none"> ▶ Programme the haemodialysis machine.
5	<ul style="list-style-type: none"> ▶ Prepare their haemodialysis venous access device‡ (where applicable). ▶ Needle their arteriovenous access§ (where applicable). ▶ Connect to the haemodialysis machine. ▶ Disconnect from the haemodialysis machine.

*Attach the necessary tubing components to the dialysis machine in an aseptic manner.

†The tubing and dialyser are washed with sterile saline solution and then the dialyser made ready with dialysate fluid.

‡A *tunnelled* dialysis catheter that is embedded in a person and can be connected in an aseptic fashion to a dialysis machine.

§Either an arteriovenous fistula or an arteriovenous graft. Both require needles to be placed into them for blood to be extracted and returned as part of the dialysis treatment.

SHC, shared haemodialysis care.

SHC within the total Oxford Kidney Unit centre-based HD adult population. This measure would be expressed as a percentage with the numerator being the number of people receiving centre-based HD and performing any degree of SHC and the denominator being the total centre-based HD population. A secondary outcome measure—the stage of competency of those performing SHC—would be defined as an absolute number of individuals performing SHC at each stage of competency per HD centre.

Each HD centre designated a staff member to update a shared spreadsheet with details regarding the individuals receiving treatment at their centre. By entering dates that competencies were achieved as well as key dates for events that meant they were no longer performing SHC (for example, if they received a kidney transplant, died or moved out of the area), then an automated count of patients engaging with SHC, broken down by their stage of competency, was able to be generated. Staff would aim to update centre data on a monthly basis, time and resource depending and data would be pooled for purity checks and run chart generation. Run chart trends would be analysed using accepted methods²⁵ to examine for special cause variation and contextualised relative to Plan-Do-Study-Act (PDSA) cycles.

As a process measure, the proportion of individuals in each HD centre being offered SHC was considered.

However, the project team felt that collecting this data manually each month would be a significant burden on staff time and resources. Therefore, it was agreed that staff initiative in offering SHC to patients would be reviewed through informal feedback initially until an automated process of collecting this data was established. During the later stages of the project, additional information technology resources were secured to enable changes to the electronic patient record. An SHC section was created within the electronic patient record where HD staff could complete information as to whether SHC had been offered and the outcome of the discussion. This would allow ready identification of individuals who were yet to be offered SHC so they could be the focus of a targeted approach each month. Although this information would be available to staff in HD centres, summary data on this process measure were not available to the project team to report.

As balancing measures, informal feedback was obtained from HD centre nurses on how patient training for SHC impacted staff workload and resources and if there were any grievances reported by individuals on being approached about SHC when their clinical situation was not appropriate to engage. HD centre staff record all patient safety incidents through a centralised safety incident reporting system and these are reviewed by senior HD staff and discussed at monthly departmental governance meetings.

These were retrospectively reviewed by the project team to identify if there were any safety incidents relating to SHC reported during the time period of the project.

DESIGN

The project was led by a deputy HD matron and supported by a senior clinician with a team that included: All seven HD centre lead nurses; information technology specialists; and a quality improvement fellow. Project meetings were held virtually on a monthly basis. A detailed stakeholder analysis was conducted and the project plan was discussed at a departmental meeting to gain buy-in from senior clinical and management teams. The project was registered and approved as a quality and service improvement project by the Oxford University Hospitals NHS Trust and did not require ethical approval.

The key barriers to promoting SHC are patient and staff knowledge; patient beliefs about their capabilities and skills along with environmental context and resourcing issues.²⁶ Intervention strategies to overcome these barriers would focus on providing individuals with information and arming professionals with the necessary skills and resources using the tools and roadmap as devised by the Sharing Haemodialysis Care Improving Outcomes collaborative.²⁷ These resources have been developed in conjunction with patients and were readily applicable to the local context. Interventions were planned to achieve the following objectives through sequential PDSA cycles:

1. Improve baseline levels of staff knowledge, confidence and empowerment.
2. Identify and remove key barriers to implementation.
3. Raise awareness and knowledge among those receiving centre-based HD.
4. Develop centre SHC leadership to sustain and rejuvenate improvement.
5. Establish a process for automated data collection and review to ensure sustainability and embed SHC as a standard of care.

STRATEGY

The project had two phases, a sentinel phase involving PDSA cycles 1 and 2 focusing on the two HD centres within Oxford followed by a scaling-up phase involving PDSA cycles 3 and 4 rolling out across all remaining HD centres. The decision to start centrally was strategic as there was also already some limited SHC experience within these centres and the project lead was primarily based there and was well-placed to test and evaluate interventions. The sentinel phase ran from April 2022 to October 2022 while the scaling up phase then ran from November 2022 to December 2023.

PDSA cycle 1 ran between April 2022 and June 2022. A survey regarding staff knowledge and perceptions of SHC developed by the Sharing Haemodialysis Care Improving Outcomes collaborative²⁸ was administered to staff within one of the Oxford HD centres. The results were reviewed to understand local themes on staff perceptions of the

benefits and barriers to offering SHC. Teaching sessions were then developed and delivered for staff within both Oxford HD centres starting in May 2022 and continued until November 2022. Staff were also directed to individual stories and videos within the Sharing Haemodialysis Care Improving Outcomes website²⁹ to gain a better understanding of the individuals' perspective, an insight that many reported they lacked. A key outcome of this PDSA cycle was the identification of motivated staff members who became designated as the SHC 'champion' within each HD centre. As detailed further, these champions would embed and sustain SHC growth.

The second PDSA cycle ran between July 2022 and October 2022. Feedback from staff in cycle 1 suggested that the project should move to focus on engaging and empowering those receiving treatment so that conversations regarding SHC could become more bidirectional. Noticeboards were developed in conjunction with patients with individual stories and pictures and were displayed in the waiting rooms of HD centres in high-profile areas. Patient information leaflets created with input from those receiving HD were developed and used (online supplemental 2) to describe what shared care is, its potential benefits and how they would be supported to participate. A key outcome from cycle 2 was the improved understanding that conversations about SHC should be organic and viewed as a timeline rather than a one-off intervention, as such, staff were encouraged to discuss and offer SHC at intervals every 3–6 months to individuals who had previously opted not to participate.

The scaling-up phase began with PDSA cycle 3 running from November 2022 to April 2023. The project team recognised the importance of gaining buy-in from all HD centre lead nurses prior to rolling out SHC to their centres. All were enrolled and attended a 2-day virtual training course developed by Barnes and Wilkie.³⁰ Two individuals receiving centre-based HD in Oxford who were already participating in SHC were also invited, allowing staff to gain insight into the patient experience. The course helped transform the staff mindset towards SHC, encouraging them to learn from shared experience, consider their environmental strengths and weaknesses and generate ideas to test within their own centre. The lead nurses cascaded this learning to staff within their HD centres through weekly improvement huddles. Like the sentinel phase, an SHC champion was identified in each of the satellite HD centres. Monthly meetings were set up between the project lead, HD centre lead nurses and the champions to discuss progress and gather feedback.

The fourth PDSA cycle ran from May 2023 to December 2023. Due to the positive feedback from the virtual course in PDSA cycle 3, the project team felt it would be beneficial for HD centre staff of different levels of seniority to attend this course. Four staff members including the SHC champion from each HD centre attended the virtual training course in turn along with one–two people receiving HD treatment from their centres. The training couldn't be offered to all staff due to limited

availability of places per year, however, learning obtained by attendees was routinely shared during weekly improvement huddles. HD centre lead nurses also were offered to network with professionals from other HD centres across the UK through a quarterly virtual forum hosted by the Sharing Haemodialysis Care Improving Outcomes collaborative to learn from and share SHC experiences.

Sustainability

Several strategies to promote sustainable change were adopted, focusing primarily on the role of the SHC champion in each HD centre. Each champion was an experienced staff member confident and enthusiastic about SHC. They would be tasked with promoting SHC within their unit which could take the form of many activities. They would: Promote the implementation of new ideas; disseminate feedback on SHC data; ensure that new individuals were being offered SHC; and that new staff joining their centre were brought up to speed with the concept. While education sessions were initially run by the project lead, updates were delegated to the SHC champions. As longitudinal data became available, details regarding SHC uptake within each centre were fed back to staff to highlight the progress they were making and offer encouragement. As mentioned, changes to the electronic patient record allowed a less burdensome and more sustainable method of monitoring patient SHC opportunities.

RESULTS

At the start of the project, only 4% (19/483) of those receiving centre-based HD in any of the seven Oxford Kidney Unit catchment HD centres were performing

SHC. By the end of the reported time period in December 2023, there were 220 individuals performing SHC (at any stage of competency) representing 43% (220/511) of the prevalent centre-based HD population. **Figure 1** illustrates this growth with labels approximating PDSA cycles.

Taking the starting proportion as an assumed baseline, there was an evident positive shift and trend starting from July 2022 correlating with PDSA cycle 2 interventions but also driven by an increase in uptake at satellite centre one. The lead nurse for this centre had been enthused by the events in PDSA cycles 1 and 2 and had started to initiate growth in their centre prior to the scaling-up phase. The project team viewed this as an unexpected benefit. Through PDSA cycles 3 and 4 growth began to occur in other satellite centres at a faster rate than the central Oxford HD centres. Feedback suggested that the Oxford HD centres care for individuals with more complex needs and had a higher turnover of people on dialysis which may have led to a reduced opportunity to participate in SHC for these people.

Most of the growth observed was attributable to an increase in stage 1 competent individuals. However, there was also a steady and maintained growth in the number of people attaining higher stages of competency in the latter phase of the project as detailed in **figure 2**. Significant increases in competency did not occur until late in the project, possibly reflecting the time it takes for individuals to gain confidence at lower stages before taking on more complex HD-related tasks.

There were a total of 23 individuals who stopped performing SHC during the measurement period. The most common reasons to do so being death or receiving

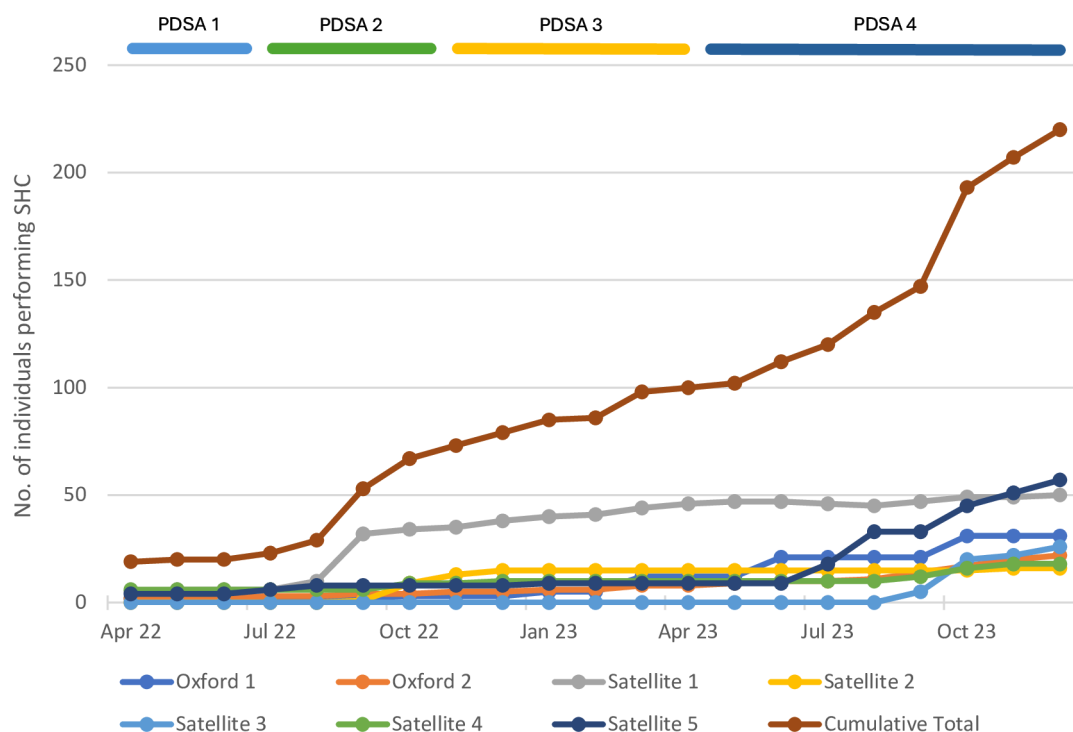


Figure 1 Growth in SHC participation across the Oxford Kidney Unit HD centres. HD, haemodialysis; PDSA, Plan-Do-Study-Act; SHC, shared haemodialysis care.

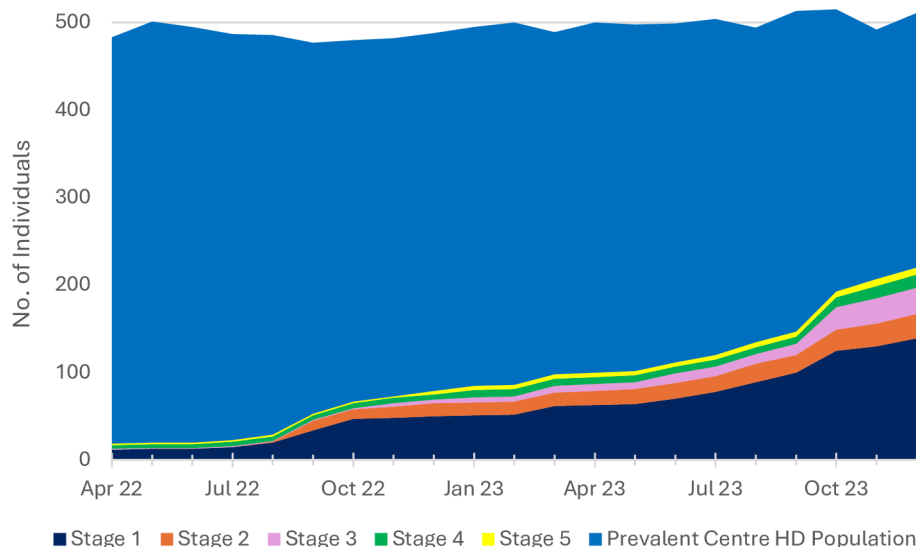


Figure 2 Growth in SHC competency within the centre-based HD population. HD, haemodialysis; SHC, shared haemodialysis care.

a kidney transplant. The majority (19/23) were stage 1 SHC competent at the time of stopping. Only one individual made the transition from stage 5 SHC competent to performing home HD.

There were no reported negatives in relation to implementation from staff or patients captured via informal feedback or through incident reporting processes. Many staff members felt that SHC gave their work a different angle and were energised by the new challenge. Patients also reported a new sense of purpose with some more motivated individuals subsequently being invited to participate in nationally run courses to educate and promote SHC.

LESSONS AND LIMITATIONS

The project achieved over double its intended primary aim and demonstrates that an SHC programme can be rolled out at scale across multiple sites with little in the way of resource demands, beyond enthusiasm and time from both staff and those receiving care. SHC growth in individual HD centres depended as much on an enthused patient population as it did on a change in staff mindset in keeping with subsequent findings by Keriakos *et al*³¹ that suggest co-production between patients and staff is likely more powerful than modifying staff beliefs alone. The input from those receiving care through helping develop resources like the information leaflets and noticeboards and in their contributions at the training sessions were likely vital to the project's success. The project gained traction from senior clinicians and the management team as they were aligned with national priorities. The role of the SHC champions enabled local project ownership and leadership and the monthly meetings between the project lead and the champions helped maintain momentum. Staff experiential feedback has been overwhelmingly positive and it is conceivable that as more activated and capable patients are able to undertake some

of the component nursing tasks, this will enable staff to dedicate more time caring for other unwell people within the centre.

The large increase in the number of patients performing SHC did not immediately translate to an increase in the number or proportion of individuals performing home HD contrary to the findings of the SHAREHD trial.¹⁶ However, it is encouraging to note that at the time of writing 10 new patients from within the SHC programme have expressed an interest to transition to home HD and work continues to support them to do so.

The next phase of the project will aim for a target of >50% of individuals receiving centre-based HD performing SHC by December 2024. To this end—auditable data from the electronic patient record will assist in understanding the reasons why some people have not been offered or declined SHC and plan interventions tailored to them. Future planned interventions include setting up patient peer support groups within HD centres and cohorting individuals performing SHC with those who have declined SHC at the same session time and within the same clinical area to encourage peer-to-peer conversations. Finally, work has begun to involve the team in the advanced kidney care clinic where treatment options are discussed with a person before they reach ESKF to introduce the concept of SHC even prior to them starting dialysis. This could be crucial to instilling the importance of self-care in people before they ever become exposed to a passive environment.

The project had several limitations. Data regarding SHC participation were not collected routinely prior to project initiation. While a period of observation without intervention would have been preferable to provide a stable baseline for measurement with data captured and reported at monthly intervals, establishing a baseline would have taken many months. The project team opted

to forgo such a period to give individuals the opportunity to engage with SHC as soon as possible.

While there were efforts to standardise competency assessment, there was no assessment of inter or intra-assessor variability due to resource constraints. Data collection itself was manual, time-consuming and limited the scope of what could be measured. Often, due to competing clinical priorities, staff struggled to review data at the intended monthly interval. Work continues regarding data collection via the electronic patient record which may enable regular automated data extraction in the future to assist in analysing the demographics and characteristics of those being offered or declining SHC.

CONCLUSION

Interventions to promote SHC participation have been reported in a single stepped-wedge cluster randomised trial¹⁶ but to our knowledge, this is the first quality improvement project to report on the implementation of a multisite SHC initiative outside of a research setting.

There is no routinely collected validated data on the proportion of individuals performing SHC in the HD centres across the UK to allow comparison with our centre's SHC activity. However, the UK Patient Reported Experience Measure survey reported that SHC is offered variably ranging from 15.4% to 90.3% of individuals polled within UK HD centres.²³ These results are likely not a true representation of SHC activity as the response rate from individuals was low at only 30% of the total centre-based HD population. SHC activity has also been reported in other countries^{19 32 33} but with no detail as to its implementation.

This project outlines an approach to promoting SHC that is directly transferable to other HD providers, both within the UK and internationally. Communication and collaboration between staff and patients allowed the creation of a culture where providing HD is no longer a passive process but requires active engagement of individuals on HD that could lead to tangible improvements in their well-being and outcomes. Beyond the individual and local benefits, if SHC can truly be a bridge to home HD there are potentially significant cost savings for the NHS.

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Contributors AP led the project, arranged meetings, ran initial education sessions and assembled and organised the project team. MR, GD, EG, EN, JJ, JP and RS were lead nurses who carried out interventions and were responsible for data collection. UPU assisted with QI methodology and strategy, progressed changes to the electronic patient record and is the guarantor for the overall content. DG organised and analysed the data, generated charts and wrote the manuscript with supervisory input from UPU.

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