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QI initiative to reduce the number of inpatient falls in an acute hospital Trust

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ABSTRACT

Inpatient falls are one of the most frequent concerns to patient safety within the acute hospital environment, equating to 1700 falls per year in an 800-bed general hospital. They are predicted to cost approximately £2600 per patient, however, this estimate does not capture the costs and impact that inpatient falls have on the wider health and social care system. It also does not take into the account loss of confidence and delays in functional recovery.

This report shares the learning from a quality improvement (QI) initiative that took place in a District General Hospital (DGH) in the UK. The initiative started in February 2020, was paused November 2020 due to wave 2 of the pandemic and restarted in March 2021. Improvement was achieved in January 2021.

Data for falls within the Trust identified that falls were within common cause variation. A system change was needed to achieve an improvement.

A QI project was commenced with the aim to achieve a 5% reduction in falls per 1000 bed days in a care of the elderly ward.

Two primary drivers were identified: recognising patients at high risk of falls and preventing them from falling. Change ideas to address these primary drivers were tested using Plan Do Study Act (PDSA) cycles. Changes tested included: the development of an assessment tool to identify patients at high risk of falls, use of a wristband to identify patients at high risk of a fall, and increased observation.

Change ideas achieved some success with the process measures but did not achieve an improvement with the outcome measures. A Trust wide change idea relating to the falls prevention service did lead to a sustained improvement in falls reduction.

The barriers to the improvement included changing Trust priorities during the pandemic, and limited opportunities to fully engage the ward-based team with systems thinking and changing mental models.

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WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Despite a multitude of studies focusing on various aspects of falls risks and subsequent prevention, there is not a single definitive method to reduce falls numbers in hospitals.

WHAT THIS STUDY ADDS

⇒ This study demonstrates the value of using a quality improvement approach to achieve locally sustained improvement. A visible falls practitioner focusing on prevention work in the clinical setting leads to a reduction in falls.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Findings have highlighted the need to address cultural working practices to achieve improvement. Organisations should consider the role of the therapist in falls prevention.

PROBLEM

West Hertfordshire Teaching Hospitals National Health Service (NHS) Trust provides acute healthcare services to a core catchment population of approximately half a million people living in west Hertfordshire, England. Overall, the population served by the Trust is relatively affluent, but there are some areas of deprivation.

The Trust provides a range of more specialist services to a wider population, serving residents of North London, Bedfordshire, Buckinghamshire and East Hertfordshire.

Baseline data for falls within the Trust demonstrated the number of falls were within common cause variation, and although not an outlier against national data, the senior leadership team identified this as an area for improvement (figure 1). When a system is showing common cause variation a system change is needed to achieve an improvement. A care of the elderly ward with 28 beds agreed to join the quality improvement (QI) project team and to be the testing area for the change ideas.

The aim of the improvement initiative was to achieve a 5% reduction in falls per 1000 bed days in a care of the elderly ward.

BACKGROUND

Literature from the UK identifies inpatient falls as one of the most frequent concerns to patient safety within the acute hospital environment.[1] Past audit data has shown an average of 6.63 falls per 1000 occupied bed days, which in turn equated to more than 1700 falls per year in an 800-bed general hospital.[1] No fall is completely harmless. There is often a psychological sequela leading to a loss of
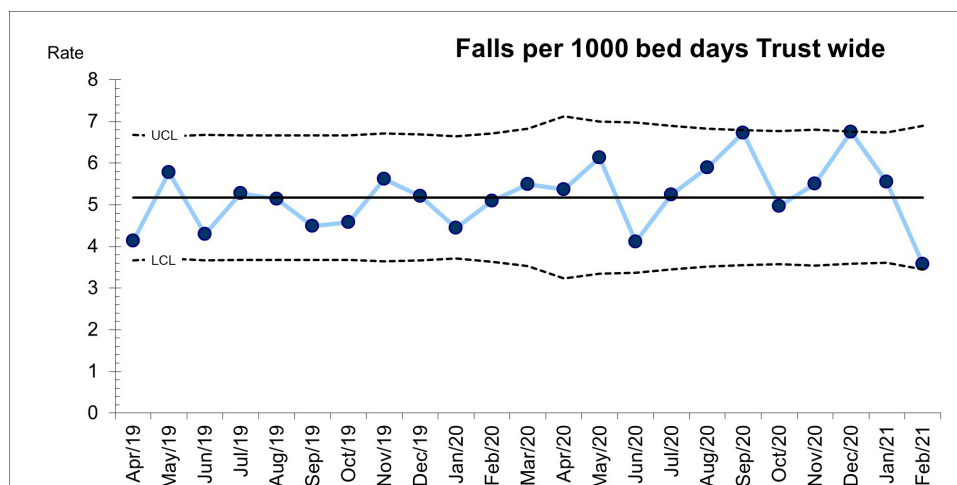
Figure 1 Trust baseline data—falls per 1000 bed days.

confidence, delays in functional recovery and ultimately prolonged hospitalisation.[1]

Falls are estimated to cost the NHS £630 million annually.[2] In a report from the financial regulator these falls are predicted to cost approximately £2600 per patient. However, this estimate does not capture the costs and impact that inpatient falls have on the wider health and social care system.[3]

Trusts have recognised the importance of a certain level of observation for patients at risk of falls and how this can go some way into reducing inpatient fall numbers and hip fractures.[2] However, the challenge with falls prevention and management is that the main risk factors for falls relate to people's individual characteristics and circumstances.[4]

Hospitalised patient falls are the result of interactions between a multitude of factors including comorbid conditions, acute illness, environmental changes and medical/surgical procedures.[5] The combination of these, together with their evident complex nature, suggests that there will not be a single cause of falls, and that there needs to be an awareness that its management is only effective when tailored to address patient-specific needs.[6] Identifying patients at risk without acting on it may provide staff with false reassurance.[5] Both studies are from the USA.

A widely used method of identifying the individual needs of patients in an inpatient setting in the UK is the use of coloured wristbands. These are already in use to highlight needs such as allergies or to support those with a cognitive impairment.[7] As this is a method that is already used, it could be suggested that this could be readily adopted to highlight a falls risk. However, this report highlights that there is little known about the effectiveness of visual identifiers.

MEASUREMENT

Outcome, process and balancing measures were identified.

Outcome measure: Rate of falls per 1000 bed days.

Process measures related to the change ideas included:

- ► Accurate falls assessments.
- ► Application of wristbands.
- ► Tag in/tag out system.
- ► Weekly falls awareness delivered on wards.
- ► Post fall review of all falls within a set time frame completed by the falls practitioner.

The balancing measure observed:

Increase in falls among patients at risk, rather than high risk of falls.

The data regarding the accuracy of assessment and use of wristbands was initially monitored daily while the new assessment tool was being developed and then was recorded weekly.

The data for the increased observation of the bays was gathered by observation and was carried out on four occasions.

The data on the post fall review was gathered prospectively and analysed weekly.

DESIGN

The project team was established and included the nursing staff from the ward, a care of the elderly consultant, therapists, the falls practitioner, a pharmacist and the QI team. At the start of the project, the team assessment revealed that there was a good team in place when reviewed using the model for understanding success in quality (MUSIQ) sustainability score. This initiative straddled the pandemic waves 1 and 2 (March and November 2020). The membership of the project team was depleted to the core members of the ward team and the QI team, with inconsistent input from the falls practitioner, therapy and medical staff due to redeployment in waves 1 and 2. The remaining project members met throughout the project and worked with the clinicians on the ward. After wave 2, the MUSIQ score had declined and no longer showed a score likely to achieve a change. This reflected that the medical staff had other priorities at the time, and this influenced the success of the change ideas.

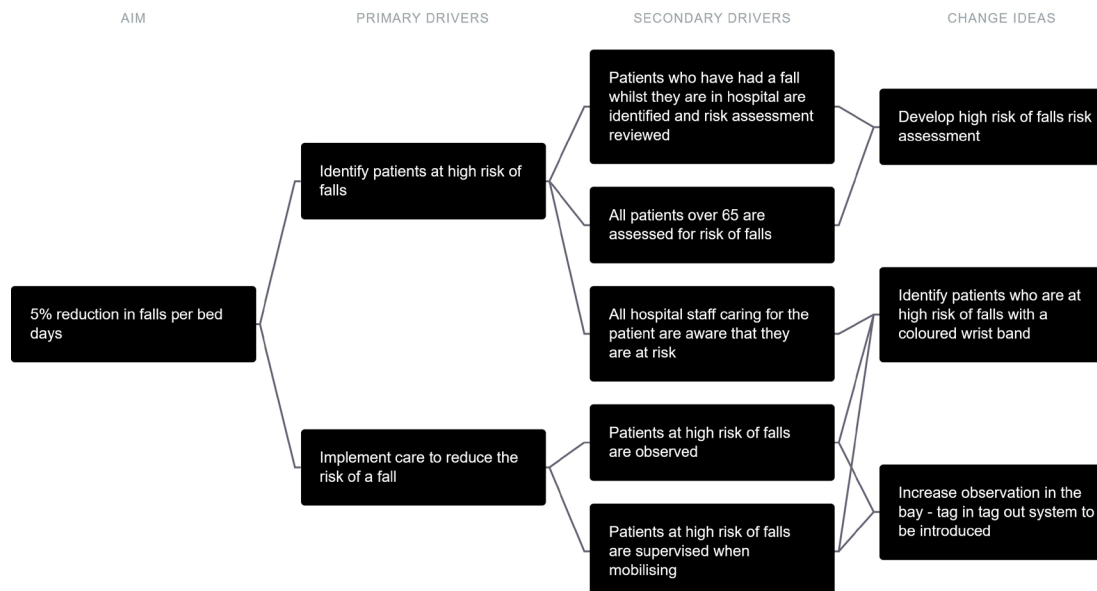The project team developed a driver diagram (figure 2) and from this identified two primary drivers:

AIM · PRIMARY DRIVERS · SECONDARY DRIVERS · CHANGE IDEAS

Figure 2 Driver diagram.

▶ Recognising patients at high risk of falls.
▶ Preventing them from falling.

Developing the driver diagram led the team to identify two initial change ideas related to identifying patients at risk of falling:

▶ Developing a risk assessment tool that identified patients who are at very high risk of falls.
▶ Identifying these patients with a coloured wristband.
▶ Later a third change idea was developed: tag in/tag out system in the bay.

A patient at very high risk was identified by fulfilling one or more high risk criteria, as defined by National Institute for Health and Care Excellence (NICE) guidance, and they also had to be likely to attempt to walk unaided or unsupervised.

PDSA cycles were carried out to test the change ideas:

PDSA cycles: change ideas 1 and 2 predictions:

▶ The team predicted that the nurses would be able to identify patients who are at a very high risk of a fall using a risk assessment tool.
▶ The patients would agree to wear a coloured wristband and that the nurses would supervise a patient with a wristband.
▶ Non nursing staff on the ward would ask the patient to wait for a nurse if they saw them attempting to mobilise without supervision.

Accuracy of the assessment was judged according to the patient meeting the agreed protocol and any discrepancies were discussed and agreed at the multidisiplinary (MDT) ward round.

Strategy

During these PDSA cycles, the ward-based therapists and nurses worked collaboratively to both refine an assessment tool to identify patients who were at very high risk of falls and to ensure the staff were trained and able to differentiate between patients at risk of falls and patients at very high risk of falls.

Learning from the PDSA cycles showed that the criteria in the initial version of the assessment tool was including patients who were bedbound or would not get up unsupervised as at 'high risk'. In fact, these patients were not high risk and would not require additional supervision while mobilising.

The assessment tool for identifying patients who were at 'high risk' of falls underwent nine PDSA cycles until the clinical team identified that the tool was specifically identifying 'high risk' of falls patients.

PDSA cycles to test the use of a coloured wristband to identify patients as high risk were run in parallel to the testing of the assessment tool. Data was collected through qualitative feedback and quantitative feedback measuring if the patients who were identified as 'high risk' of falling were wearing the wristband.

Three PDSA cycles were completed:

▶ PDSA cycle 1 identified that the wristband was acceptable to the patients.
▶ PDSA cycle 2 identified that the yellow-coloured wristband was not easily visible against pale skin and the wristband colour was changed to green.
▶ PDSA cycle 3 identified that the wristband was accepted by patients and that the nurses reported that they were able to easily identify the patients with the wristband on.

The predictions for the high-risk falls assessment were met, however, the prediction for the wristband was only partially met. The process of applying the wristband was successful, however, the prediction that there would be increased supervision of patients wearing a wristband when mobilising was not met.

Data was gathered through observation. Qualitative data to explore the barriers to increased observation were gathered using a fishbone diagram.

The nurses reported that they were not always able to supervise the patients due to other clinical commitments which meant they did not always witness the patient mobilising. Additionally, patients sometimes wanted to go to the toilet unsupervised or would return to their beds without calling for the nurse to supervise them back to their bed area and some of them fell in the bathroom when unsupervised.

The clinical staff identified a change idea to increase the level of supervision. The change idea was to hand over the bay to a colleague when they were leaving the bay. This was called 'tag in/tag out'. The staff in the clinical area said this phrase to each other as they handed over the bay so that they were aware if they were the person responsible for watching the patients in the bay. This change idea was not the same as 'bay watch' as the staff could hand over watching the bay to any member of staff in the bay, for example, doctors, pharmacists and therapists and there was not an absolute rule that the bay needed to be supervised.

The prediction was that the nurses would hand over the bay to each other or to other MDT staff and in doing so would increase the supervision of patients identified as very high risk of a fall.

Before this PDSA cycle could be tested wave 2 of the pandemic led to increased pressure on the hospital and a change in the profile of patients on the ward; the QI initiative was paused for 3 months.

When the QI initiative was relaunched, the change idea tag in/tag out was introduced. Four PDSA cycles were completed.

PDSA cycle 1: The nurses tagged in each other and the therapy staff. The staff were focused on the PDSA cycle and supervision in the bay was maintained.

PDSA cycle 2: The nurses only tagged in each other and did not use the opportunity to tag in the wider MDT, demonstrating the challenges of achieving a cultural shift.

PDSA cycle 3 was a success throughout the shift, however, this was dependent on student nurses being on shift and was not sustained when they were not on shift.

PDSA 4 demonstrated that the nurses tagged in and out of the bay to each other but not to other members of the MDT. The nurses reported that this helped them to feel confident about leaving the bay to carry out duties. However, there were times when the bay was unsupervised, and no one was 'tagged' to observe the bay.

The nurses reported that they felt that the change idea was working between themselves but not with other colleagues. This change idea required a cultural shift with all the members of the MDT being involved in the tagging system. Although the wider MDT were involved in discussions about the change idea, the timing of introducing the change idea—emerging from wave 2 of COVID-19—was a barrier to their involvement. It could be suggested that time to focus on current mental models and service delivery methods and the required cultural shift was needed to support this process.[8]

Falls prevention service change idea

A new change idea was identified with a change in the falls prevention service. At this time, a physiotherapist joined the service as falls prevention practitioner. The practitioner suggested that instead of an over-reliance on prediction tools, the focus should be given to educating staff on the complex nature of falls and the need for multifactorial risk assessments in line with NICE guidance.[9]

Using the evidence to support a theory for change, the falls prevention practitioner visited the wards daily and asked staff about patients who were high risk of falling. They supported staff in assessments and used the clinical time to raise awareness of falls prevention. Additionally, all patients who had fallen within 24 hours or the next working day if they occurred at a weekend or public holiday, were reviewed by the falls practitioner. The falls practitioner carried out a ward-based review and training session with the staff in the respective clinical areas following each fall.

The change idea focused on supporting ward staff to gain an enhanced understanding of falls and the recognition that a multifaceted approach is required. This also brought the service more in line with the NICE guidance on falls to move away from a risk stratification tool approach and towards a personal medicine approach based on individual clinical reasoning.[10] Matching this to change concepts,[11] the change idea related to extending specialist time and increasing education.

Predictions

The prevention training, and support post fall would support staff to understand the complex natures of falls prevention and how to plan individualised fall prevention strategies.

Working with the falls practitioner would enable staff to develop their clinical skills and to facilitate patient-specific interventions.

Building relationships would build a trust and enable honest discussions about incidents.

Raised visibility of the falls prevention service led to requests for further teaching and referrals for complex patients.

Processes followed when reviewing the patients:

Attendance to morning huddles to discuss individualised risk assessments.

Bite sized training offered at a convenient time for the ward and repeated to small numbers of nurses to ensure significant number of staff had had training.

Honest discussions about contributing factors to incidents and learning.

Measurement

The approach used weekly data collected across the Trust, and monthly data for individual wards to give each nursing team a deeper understanding of the falls
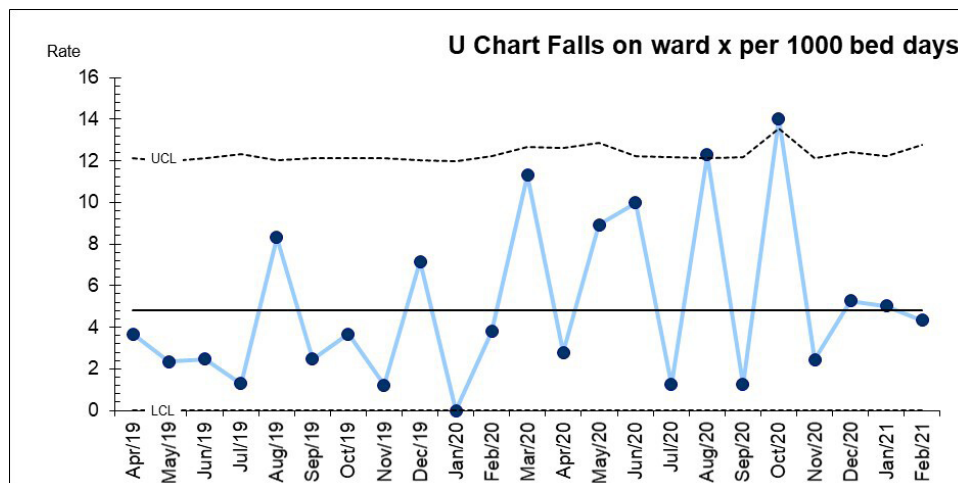
Figure 3 Statitistical Process Control Chart (SPC): falls per 1000-bed days on the ward.

that were occurring in their areas and to support a more tailored approach.

RESULTS

The ward-based initiative did not demonstrate an improvement (see figure 3).

Two change ideas were successfully put in place:

▶ Development of a 'high risk' falls assessment.

▶ Identifying patients at very high risk with a wristband. However, these change ideas did not lead to the predicted increased supervision when mobilising.

The second change idea 'tag in/tag out' did not meet the predictions and was not sustained. The lack of MDT engagement is likely to be a factor. It is possible that this change idea could be retested following team training in relation to systems thinking and mental models and at a time when the MDT were able to focus on the initiative.

Due to the pandemic, the number of beds on the ward varied, therefore, the data was analysed using a rate. Special cause for improvement was demonstrated in August and October, however, the improvement was not sustained. It is possible that the August data related to a focus on the initiative at this time by the ward staff, and the October data is likely to relate to an outbreak of COVID-19 on the ward, leading to low number of admissions and a change in the acuity of the patients. The improvements were not sustained, and the special cause variation was not related to a system change. It is necessary to identify what is leading to special cause variation to see if this can be replicated in cases of improvement and mitigated in cases of concern.

The change idea introduced by the falls practitioner of engaging staff with learning through a post fall review demonstrated improvement. The processes put in place and the outcome measure of a reduction in falls across the Trust has been sustained.

The weekly data on falls was monitored and demonstrated encouraging signs. Within 6 weeks, special cause variation for a reduction in falls across the Trust was achieved. It is important to understand which processes

led to a change so that these can be maintained to support sustained improvement. The falls practitioner was able to identify the specific processes put into practice and to hand these over to the next falls practitioner who came into the post 6 months later (see figures 4 and 5).

Lessons and limitations

Although the PDSA cycles are often depicted on a ramp demonstrating iterative learning, this is not the reality in practice. PDSA cycles are characterised by false starts, regrouping, plateaus and backsliding.[12] In addition to the usual challenges, the pandemic has added to the pressure and this QI project was characterised by a need to pause and then to regroup at various times due to the pandemic. Like many QI initiatives it was not a story of resounding success, but a story of learning, of resilience and commitment from the ward-based clinicians and then the final breakthrough when introducing a change in the falls prevention service rather than the working at ward level.

The lack of improvement with the ward initiative should not be seen as a failure. This initiative was a success as it saves wasted efforts by identifying that the QI aim could not be achieved under the existing constraints.[13] It was, however, difficult to persuade the team that they had not failed. Human factors are an important pillar in QI, as identified in Deming's profound knowledge.[11] The ward nurses and therapists were engaged with the initiative, however, the pressures that the ward experienced due to the pandemic made it difficult for the staff to be focused on the project during wave 1 and 2, and during a COVID-19 outbreak on the ward in the Autumn of 2021. Despite the lack of evidence for the effectiveness of the wristband to reduce falls, the nurses were keen to continue to use them. This gives insight into the psychological factors inherent in change. The nurses wanted to hold onto their change idea and felt that doing something was better than doing nothing despite the data demonstrating otherwise. Managing the psychological factors is an important element for any QI team. The focus is often on getting staff onboard with change and supporting
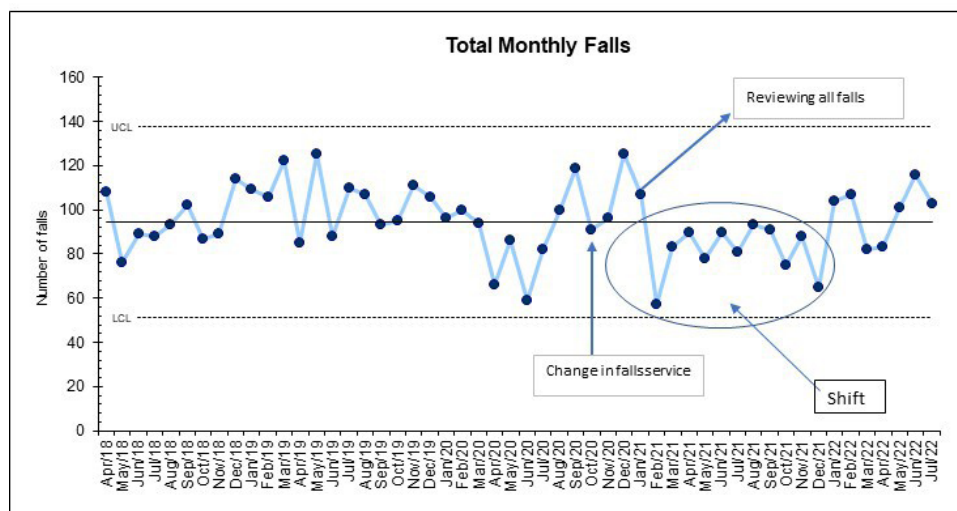
Figure 4 Trust monthly falls demonstrating special cause for improvement.

them through multiple changes of PDSA cycles. Withdrawal of a change idea may feel like failure but needs to be recognised as something requiring acknowledgement and support.

The change idea of tagging staff in to watch patients in the bay required a cultural shift, but on reflection, the groundwork for this was not done. Although the MDT were involved in discussions about the change idea and agreed to it, the team building and work to identify current mental models, and developing new ones, was not undertaken and in the current pressures, it is difficult to find the time to undertake this work. If improvement is to be achieved the clinical team need to agree to prioritise this initiative. It is possible that with further work on cultural change to increase observation that an improvement could be achieved.

As the new approach by the falls practitioner started to show evidence of improvement across the Trust, the change ideas on the ward were withdrawn. The QI team

fed back to the ward that their work had not been a failure and had ensured that processes that did not lead to improvement outcomes had not been rolled out across the Trust.

The project straddled the pandemic. The fact that the ward nurses re-engaged with the project is a testimony to their commitment to their patients, however, QI initiatives need to be in line with an organisation's priorities. The priorities changed during the pandemic, impacting on the ability of the wider project team, and ward MDT, to give the support required to this improvement initiative.

The falls practitioner was able to identify the processes that led to an improvement. These processes were handed over to a new post holder and the improvement was sustained. This demonstrates the improvement is not person dependent, and that the improvement is grounded in service delivery processes that can be sustained and replicated. One advantage with this successful change idea is that, unlike the 'tag in/tag out' change idea, it does not
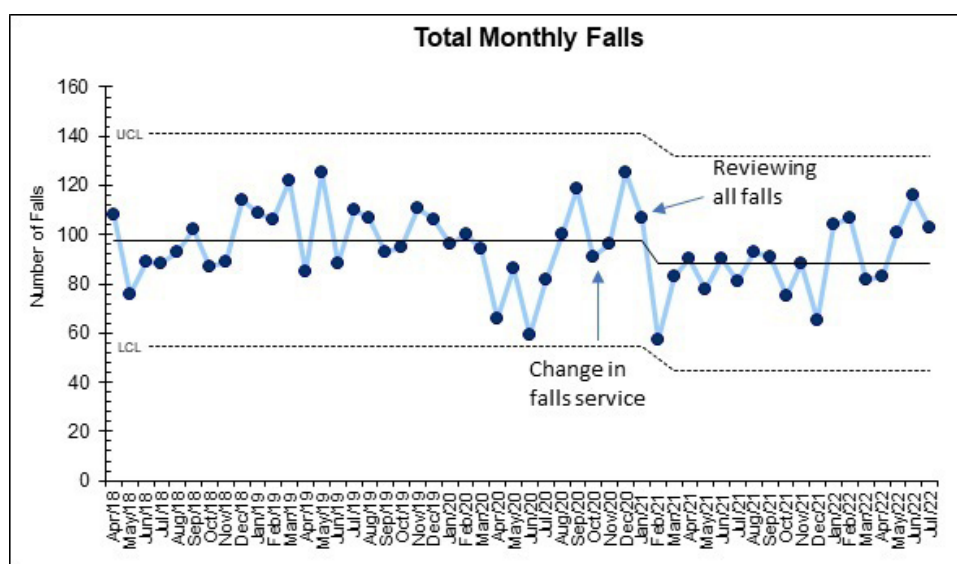

Figure 5 Trust monthly falls rephased SPC demonstrating sustained improvement. SPC, Statistical Process Control Chart.

rely on multiple agencies or teams for the change idea to be maintained. One of the barriers to successful improvement initiatives is social complexity.[14] Social complexity is the number and diversity of people involved in a project. The success of this project is largely dependent on the small falls practitioner service and this simplicity should support the sustainability of the project. Next steps will be to explore where the reduction in falls has taken place, what can be learnt from these areas and how can this be applied to other clinical areas.

Analysis of the ward-based data demonstrated that the improvement was not seen at ward level; this may reflect an unrealistic outcome measure. The small incremental improvement across several wards led improvement at a Trust level and may indicate that the original aim at ward level was not a realistic target. The next step in the project is to analyse days between falls on each ward. This will allow the falls prevention team to identify areas where there is improvement and areas where further support and training is needed.

CONCLUSION

Inpatient falls are costly to both the patients and the Trust. Reducing falls risk is complex and challenging, however, it is imperative to deliver the safest care for patients, and this means continually striving towards this goal. Addressing this challenge may be daunting to staff and requires long-term engagement and resilience, and measuring for these factors should be part of the sustainability plan. Foundation work to get the right people on board may seem like a time delay but is a worthwhile investment.

The project reflects the reality of QI, which is characterised by starts, stops and slow progress. The team demonstrated resilience by re-engaging with the project after pausing it on two occasions. Improvement was demonstrated in two of the processes trialled and it is possible that in different circumstances, or in other organisations, itmay be possible to replicate this and test change ideas to increase the supervision of high falls risk patients' mobilising.

The improvement led by the falls practitioner is replicable and has been shown to be sustained even with a change in practitioner. The falls practitioner was a therapist. Their knowledge and the processes put in place led to the improvement. Other organisations should be able to replicate this but will need to test this through QI methodology and measure both process and outcome measures.

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