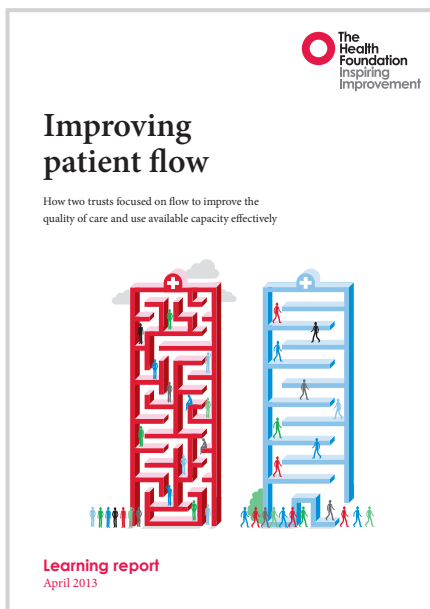


Improving the flow of older people

Sheffield Teaching Hospital NHS Trust's experience of
the Flow Cost Quality improvement programme

This case study accompanies the learning report *Improving patient flow*.
For more details, please see www.health.org.uk/flowcostquality



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Sheffield Teaching Hospitals NHS Trust

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This case study gives details of the work undertaken by Sheffield Teaching Hospitals NHS Trust as part of the Health Foundation's Flow Cost Quality programme. It accompanies the Health Foundation learning report, *Improving patient flow*, published in April 2013. For more details, and information about the work done by South Warwickshire NHS Foundation Trust, please visit www.health.org.uk/flowcostquality

Introduction

The aim of the Flow Cost Quality improvement programme was to explore the relationship between patient flow, costs and outcomes by examining patient flow through the emergency care pathway, and developing ways in which capacity can be better matched to demand. The programme ran in two NHS hospital trusts: South Warwickshire NHS Foundation Trust and Sheffield Teaching Hospitals NHS Foundation Trust. Dr Kate Silvester, a dedicated clinical systems improvement expert, supported the teams in both organisations.

The team at Sheffield decided to focus on the trust's geriatric medicine service, recognising it as a 'fractal' (part of the system that represents the whole) of the emergency care pathway. Their aim was that results from work with this key patient group will provide learning for the wider system.

The results have been very positive, with a 37% increase in patients who can be discharged on the day of their admission or the following day – with no increase in the re-admission rate, implying that patient outcomes are not adversely affected by the faster throughput. Bed occupancy for emergency care for the elderly also reduced, allowing two wards to be closed. Sheffield also reported a decrease of in-hospital mortality for geriatric medicine of around 15%. At a notional bed day cost of around £300 per day there could be an estimated cost saving/avoidance of around £3.2m per annum. This level of saving is largely theoretical and has yet to be realised.

Identifying the problems

Understanding the system

Analysis of hospital data showed that more than a third of beds were occupied by patients over 75 years and an increasing number by patients over 90 years old. Weekly audits of the geriatric medicine wards, using a tool developed by the nurses to measure 'waste' bed use, revealed that only 50% of these patients were receiving acute specialist medical, nursing or therapy care. The other half were waiting for discharge downstream into a range of services primarily including intermediate health and social care services outside the hospital.

A multidisciplinary team, representing all the roles involved in the care of patients in geriatric medicine, met regularly to gain deeper understanding of the problems and delays in the current system and to identify potential solutions to test. The team included GPs, consultant geriatricians, ward nurses, physiotherapists, occupational therapists, pharmacists, discharge liaison coordinators and discharge nurses.

High level process mapping showed the key stages in the care pathway of frail elderly patients, from when they arrive at hospital to being discharged (back home or to a residential or nursing home) or to dying in hospital. The key stages include the medical assessment, diagnosis and planning stages that apply to all patients. The initial clinical assessment results in the patient being discharged back to their home and GP, or to being admitted for specialist medical and nursing care. In both cases, the assessment or admission may be followed by a multidisciplinary nursing and therapy assessment for intermediate healthcare at home.

A closer look at data for frail older patients admitted to hospital showed that the majority were discharged within a week, and the mode (most frequently occurring) length of stay was 24 hours after admission. However, the data also showed that a few patients could spend months in hospital (see Figure SH1).

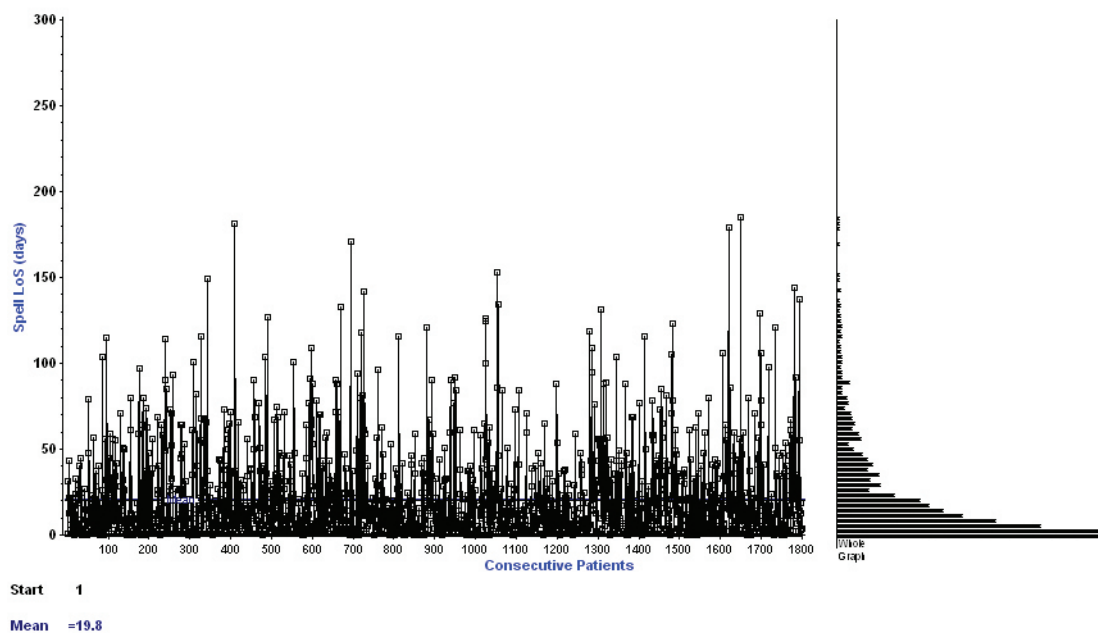
A consultant analysed the notes of 23 of the 100 patients with the longest lengths of stay. This review highlighted the difference between 'possible' length of stay (based on the first definitive note by a geriatrician that the patient was medically fit to be discharged) and 'actual' length of stay. The notes revealed multiple points when the patients could have been discharged. Opportunities were missed partly because the services involved in discharge were unable to respond quickly enough, as a consequence of a mismatch between capacity and varying demand.

As a consequence of delayed discharge, some frail patients deteriorated while others were transferred to other parts of the hospital. These transfers sometimes resulted in vital information being lost, resulting in further deterioration, re-work and delay. On average, patients spent four times longer in hospital than was initially estimated by consultant geriatricians involved in their care. It is estimated that these 23 patients received approximately £471,960 of hospital care that could potentially have been better spent on more appropriate care in their own homes, or on residential or nursing care.

There was clearly real potential to improve patient flow and the quality of care, and to reduce costs or make better use of precious resources.

'If we can get the efficiency of older people's healthcare better then I believe that so many of the other dimensions of quality – safety, timeliness, patient-centredness, equity and effectiveness – will drop out. There is enormous opportunity there.' (Tom Downes, Clinical Lead for Quality Improvement)

Figure SH1: Control chart for 1,800 consecutive geriatric medicine patients discharged between October and December 2010 and its accompanying frequency distribution chart (right) showing the wide range of variation in their length of stay



Focusing on care for the frail elderly

Through their analysis of the whole emergency pathway for older people, the team were able to understand the key constraints in the emergency process. The main patterns of flow through the process were:

- 90% of the emergency patients who were referred to geriatric medicine by their GP or A&E staff first presented to the healthcare system between 8am and 6pm
- those who contacted their GP first were not seen and referred on to the hospital until after midday
- the first of these emergency patients arrived at the hospital in the early afternoon (those using private transport arrived more quickly than those arriving by ambulance)
- patients arriving at A&E directly did not get referred on to geriatric medicine, or moved onto one of the four medical assessment units (MAUs), for at least four hours.

As a consequence of these patterns, two-thirds of the frail older patients 'arrived' on the MAU after 6pm. At this time only junior medical staff were available to assess them. Patients waited until the following morning for a consultant ward round review, often seen first by an acute physician before being seen by a geriatric

medicine consultant. The traditional model of ‘post-take’ ward rounds resulted in the ‘batching’ of patients, with the geriatric medicine consultant waiting until their post-take ward round to review up to 20 patients at a time on the MAU.

The delays in getting specialist geriatric medicine assessment meant that many frail older people had to stay in hospital overnight unnecessarily. In addition, during the initial tests of change, a limited audit of ward rounds showed that 20% of these patients had their diagnosis or care fundamentally changed by a geriatric medicine specialist if they were seen at an early stage compared to 20 hours after admission.

Furthermore, patients referred by their GP for an outpatient assessment faced significant delays. For some, this could lead to deterioration in their clinical condition and an emergency admission.

The team recognised that the key problem in their emergency system for older people was the time taken from patients presenting to being assessed and given a care plan by a consultant geriatrician. From October 2011, improving the assessment process for frail older people became the key focus for the Sheffield team’s Oobeya (‘big room’) process. (The Oobeya process involves regular project team meetings within a dedicated room in which all the project information is displayed. It offers an environment for real-time decision making that engages all relevant stakeholders. See page 18 of *Improving patient flow* for more details.)

The team identified, tested and have now implemented a range of changes designed to improve patient flow, reduce waste and improve the quality of care. These included:

- matching specialist medical capacity to patient demand:
 - change consultant working patterns from ‘post-take’ to ‘on-take’
 - see patients in real time, on admission
 - identified the requirement to pool junior doctors
- developing a Frailty Unit:
 - establish an MAU focused on frail older people
 - initial steps to merge inpatient with some elements of outpatient care
 - put in place a multidisciplinary assessment team
- speeding up discharge:
 - switch to a model of ‘discharge to assess’.

Implementing the solutions

Matching specialist medical capacity to patient demand

Change consultant working patterns from ‘post-take’ to ‘on-take’

The timely availability of skilled specialist staff is a key factor in the delivery of high quality efficient care. As in South Warwickshire, the Sheffield improvement team recognised that they needed to change the timetable of consultant activities and increase senior medical staff availability to meet patient demand as it occurred. This would prevent the delays and potential safety issues inherent in ‘storing’ patients in the MAU overnight. It would also address the distortion in demand, passed on to departments and organisations downstream in the patient pathway, caused by the ‘batching’ of patients for the post-take consultant ward round.

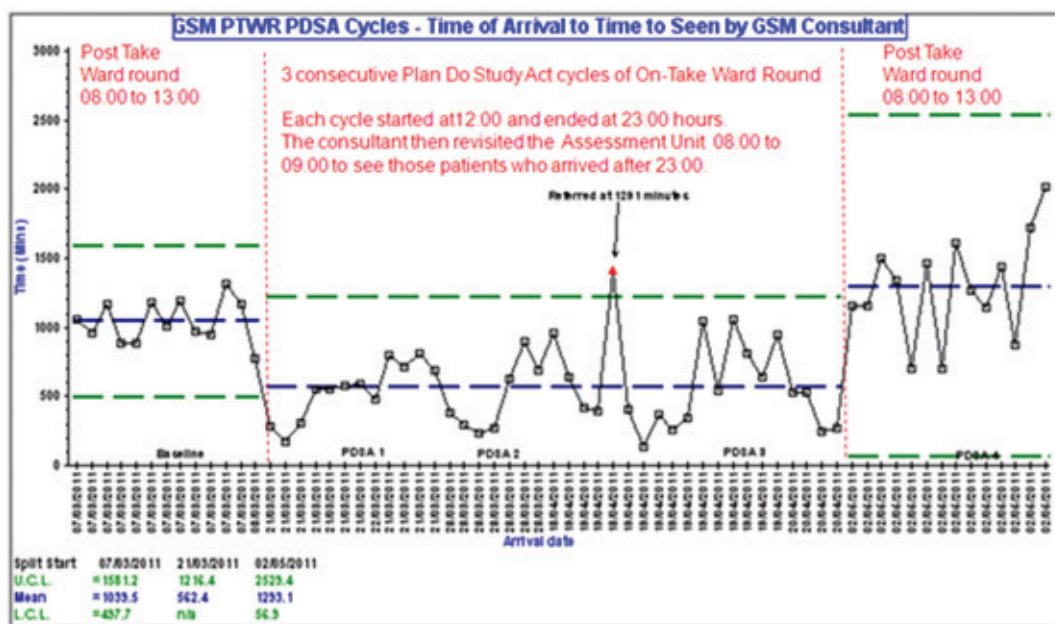
- The involvement of consultants in the various tests persuaded them that the current job plans were hindering the provision of care. This involvement was the main enabling factor in them agreeing that the job plans needed to be altered to extend the on-call service to 8pm and to increase weekend cover from 8am to 5pm. This was achieved through the job planning process, releasing time by using clinic capacity more efficiently and timetabling periods of time back in lieu. The change increased the number of older people who could be assessed on the day they presented at hospital and prevented the build-up of patients over the weekends.

- All 16 geriatric medicine consultants changed their on-call duty rotas on 1 April 2012. Although a significant change, this was a natural step from a series of tests (each with a single consultant) that had shown a range of benefits and built staff confidence.

'Different consultants learned different things. For example, one consultant with an educational interest began seeing patients alongside the junior doctor clerking them. He was able to give feedback immediately, supporting competency based learning in real time' (Tom Downes)

Figure SH2 shows the impact of different tests of change (PDSA cycles) on the time from arrival at hospital to the consultant's plan for treatment (written in the notes).

Figure SH2: The impact of different tests of change (PDSA cycles) on the time from arrival at hospital to the consultant's plan for treatment (written in the notes)



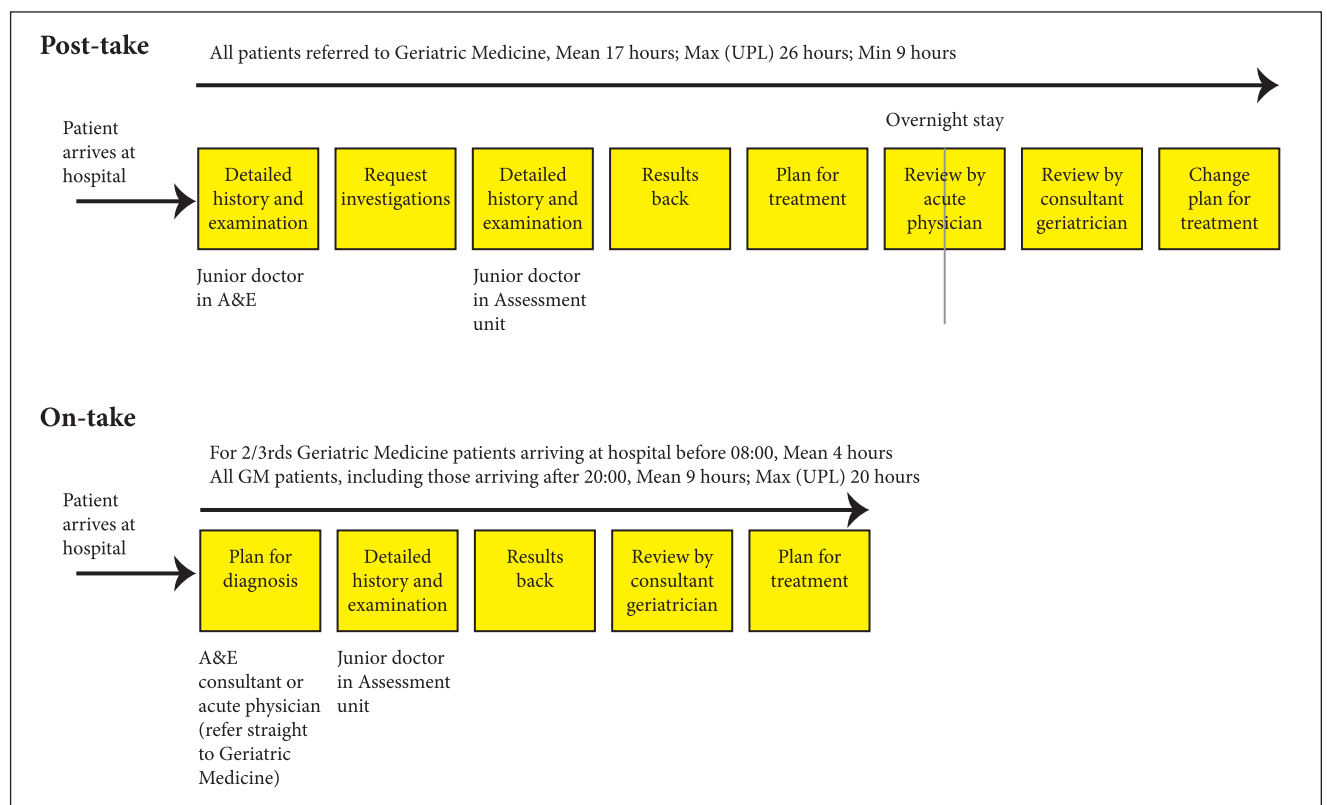
Despite the new rotas creating a few difficulties, such as some consultants finding it difficult to take back time elsewhere, the reactions of the geriatric medicine specialists have been positive. Many were unhappy with the service they had been providing and can see clear benefits in the new system, for example:

- seeing patients as they present helps pace work throughout the day and provide consistent quality of care
- earlier specialist assessment increases the chances of early supported discharge with the associated reduction in risk of healthcare-associated adverse events
- reduced inequality of service for people admitted at weekends
- improved job satisfaction and enjoyment from seeing a better service for patients.

See patients in real time, on admission

In the new system, consultants (geriatric medicine specialists) are available 'at the front door' to assess patients as soon as investigations have been done and enough clinical information is available. This is 10 to 20 hours sooner than in the previous system of post-take daily ward rounds. Faster turnaround for diagnostic tests and a clear plan of care by consultants has increased the number of patients who can be discharged on the day of admission.

Figure SH3: The change in process from the traditional ‘post-take’ system to the new ‘on-take’ system of assessment



Pool junior doctors

Reducing the time from admission to senior medical assessment may be facilitated not just through changing consultant rotas but also by changing working patterns for junior doctors.

The first delay encountered by most emergency patients is in waiting for an initial assessment by a junior doctor. However, in analysing demand, the improvement team found that there was, in fact, sufficient overall junior doctor capacity to review all presenting emergency patients within an hour of their arrival at hospital.

Pooling the capacity of junior doctors from A&E, the MAUs and the medical and surgical specialties could enable the trust to meet the peaks in emergency patient demand and eliminate ‘wasteful’ repeated assessments that were not adding value (see Figures SH2 and SH3).

Developing a Frailty Unit

Establish an MAU focused on frail older people

From their initial work on securing earlier specialist assessment of frail older patients, the team turned to reducing unnecessary overnight stays for people who were able to return home with support. One of the hospital’s three MAUs has now become a unit focusing on the medical admissions of frail older people. The Frailty Unit opened in May 2012. Its key benefit is the co-location of all the specialist, medical, nursing and therapist staff who deal with frail older people, thus improving communication and team working. Relatives of patients admitted both before and after the change have commented that the Frailty Unit is more calm and more patient focused than a normal MAU.

Merge inpatient and outpatient care

Analysis of the patient pathway had highlighted significant delays for patients referred by GPs for an outpatient appointment. As part of the process, patients often had to be referred elsewhere for investigations, such as scans or physiotherapy assessment, stretching the overall wait for weeks, sometimes months. Some were reaching crisis point before their medical outpatient appointment and the delays meant that GPs sometimes had no option but to send frail elderly patients as emergency cases to the hospital.

The improvement team set themselves a challenge: to reduce the outpatient process time from around three months to less than eight hours. They tried a small test with their next two referral letters, telephoning the patients to ask them to come in the next morning. For those two patients, all the issues identified by the GP were dealt with that day. They had all the necessary investigations, were reviewed by the geriatric medicine specialist and seen by other team members, such as therapists or a social worker, if needed.

'We were able to deliver all the value of that three-month process for those two patients in less than four hours. That morning was one of the proudest mornings of my 18 years being a doctor.'
(Tom Downes)

An unexpected finding from this test was that there was often no clinical difference in the severity of conditions for older patients who presented (or were referred by their GPs) as an emergency case or those who were referred to an outpatient clinic. There was also no difference in the process of care they required.

This led to a larger test of change: combining outpatients and emergency patients into a single system of care.

'We realised that the divide of outpatients and emergencies is artificial because most patients being referred by GPs require a secondary care consultation and in geriatric medicine that's usually sooner rather than later.' (Paul Harriman, Assistant Director, Service Improvement)

Adopting a common process for urgent and routine patients (merging inpatient and outpatient flows) aimed to achieve a manageable demand that is smoothed through the day, and to reduce both waiting and 'process' times for routine patients. Initial tests show that it has reduced the need for follow-up outpatient capacity and suggest that the outpatient service will ultimately become an integral part of the Frailty Unit.

Put in place a multidisciplinary assessment team

The trust had already put in place a dedicated 'Front Door Response Team' (FDRT). This multidisciplinary team of occupational therapists and physiotherapists, a social worker and general and mental health nurses works alongside the medical staff, providing input to clinical assessments and focusing on what needs doing to get patients back home as soon as clinically possible. However, the dispersed nature of the admission units often led to delays in accessing the service once a patient had been identified for discharge. A test was undertaken with a dedicated group working in the Frailty Unit. This showed that it made teamwork there much more cohesive and further benefiting patients.

'If we can pick patients up sooner, do the assessment in a more real time, at the right time, then we can actually work with the services outside in the community to get these patients home quicker.' (Elaine Atkin, Operational Manager, FDRT)

Speeding up discharge

Switch to a model of 'discharge to assess'

The team recognised that getting patients home more quickly required not just earlier assessment and care planning, but also work on the discharge process within and beyond the Frailty Unit. This required inter-agency working with both the local authority and primary care.

In an early meeting, the team worked with wider stakeholders to map out in detail exactly what happened along the patient pathway. Staff were then able to understand the reasons for delays and lengthy hospital stays.

‘What we’re brilliant at in Sheffield is assessing. The discharge process involved multiple assessments of patients – current and past abilities and forecasts of future abilities. In the Sheffield system, we always kept people in hospital. We sorted out medical care. Then the physios sorted what they needed to, then OT [Occupational therapy], then social services... It was a drawn-out process – a conveyor belt.’
 (Peter Lawson, Clinical Director, Geriatric Medicine)

Changes included segmenting patients. Some were straightforward discharges: once the patient could get up and walk, they were able to go home, helped by their carers. For others, there were concerns that they might not be able to manage at home once their medical treatment was over and they were clinically well.

In the past, the latter group would have been kept in hospital for assessment of intermediate and social care needs, before going home with the appropriate package of care or discharged and then brought back to hospital for assessment. In the new system, patients are discharged once they are medically fit and have an assessment – with the appropriate members of the social care and community intermediate care teams – in their own home. This enables them to access the right level of home care and support much more quickly.

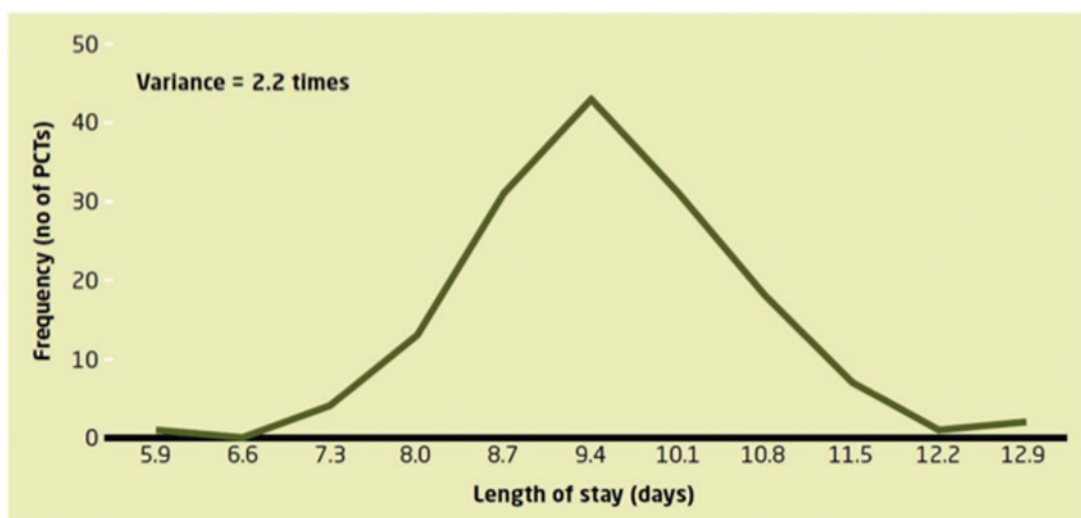
The change has truncated a discharge process of up to two weeks to care packages being put in place directly with the patient at home, enabling the Frailty Unit to reduce length of stay and therefore shortening the overall patient pathway. The ‘discharge to assess’ process is now being spread to other units within the hospital. While there have been some challenges with the capacity of post-discharge services to deal with the demand from this process, there is consensus that it provides a better model of care and work is ongoing to address this next bottleneck in the system.

Impact and learning

The suite of changes implemented in Sheffield’s geriatric medicine emergency pathway has resulted in measurable improvements. The biggest impact has been on the timeliness of assessment and treatment. The earlier in the day that a patient is assessed by the medical team, the more quickly they can get the care they need and be moved towards discharge.

A recent report from the King’s Fund (*Older people and emergency bed use: Exploring variation*, King’s Fund, August 2012) illustrated the wide national variation in average length of stay (LOS) for emergency patients over 65. Sheffield data for 2012 would have placed it at the high end, with an average LOS of 12.1 days.

Figure SH4: Average emergency length of stay for patients over 65, national distribution (King’s Fund, 2012)



While demand has stayed the same (Figure SH5), the changes have enabled the team to achieve a 37% increase in patients who can be discharged on their day of admission or the following day (Figure SH6).

Figure SH5: Number of daily emergency admissions to geriatric medicine

(provided by Sheffield Teaching Hospitals NHS Trust)

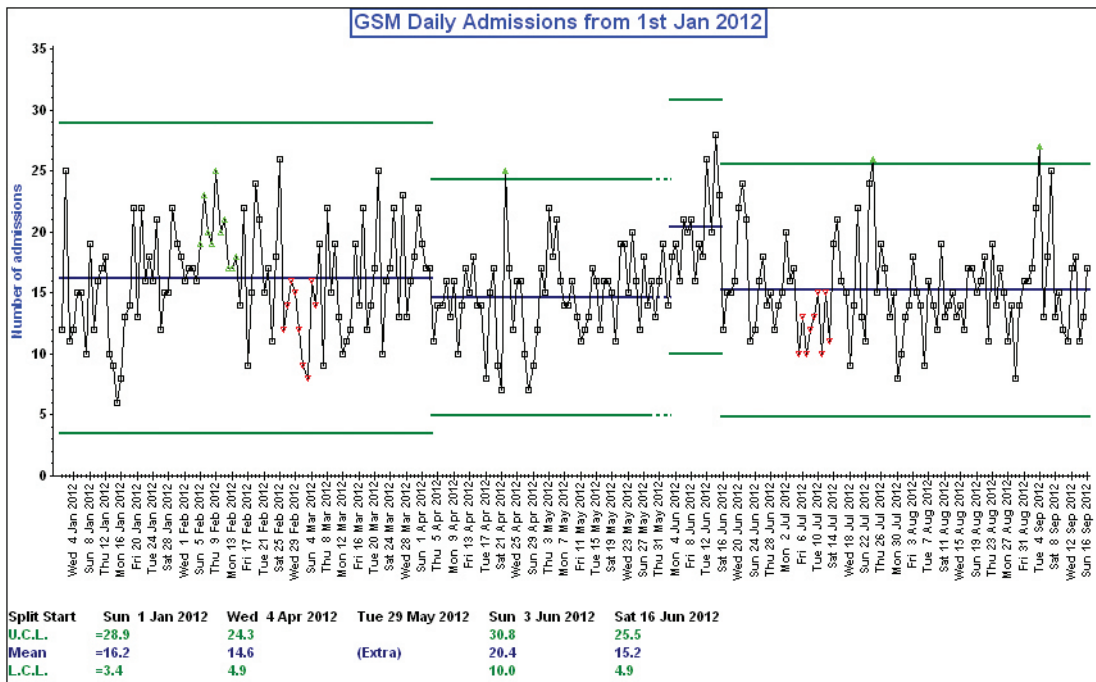
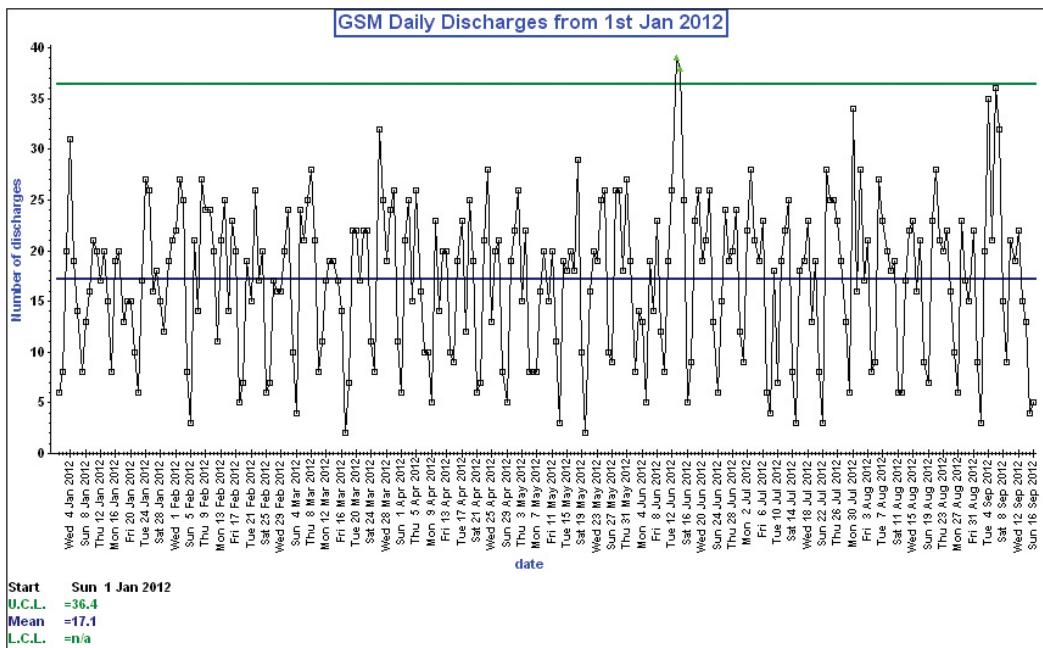


Figure SH6: Percentage of patients discharged from Frailty Unit on day 0 or 1

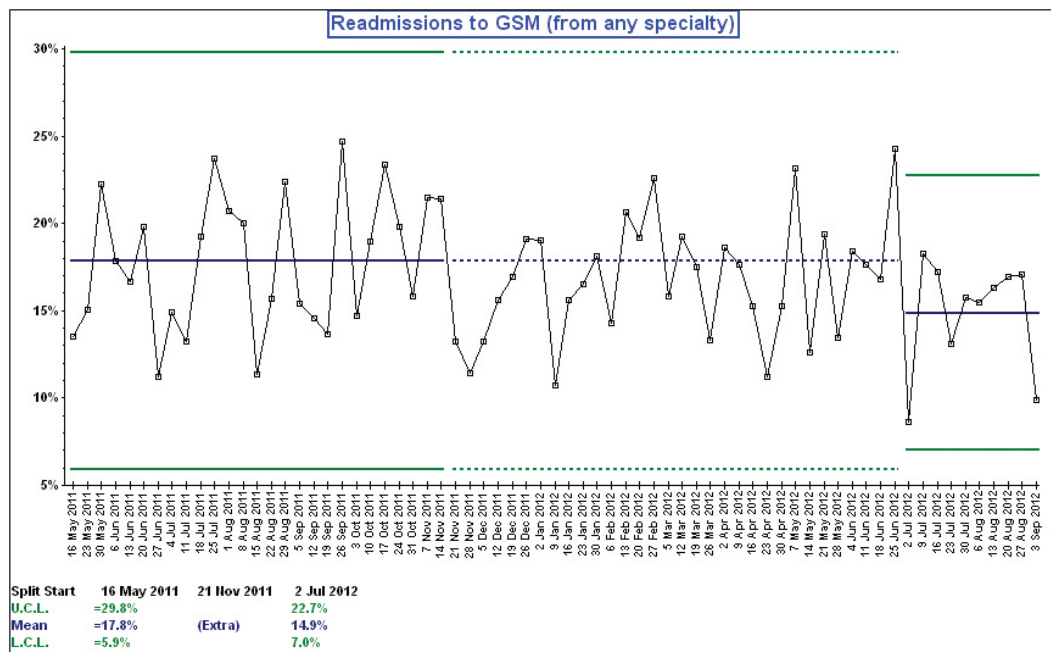
(provided by Sheffield Teaching Hospitals NHS Trust)



This equates to two additional patient discharges each day. Importantly, there has been no increase in the re-admission rate – an important balancing measure to check that patient outcomes are not adversely affected by speedier throughput (Figure SH7).

Figure SH7: Percentage of re-admissions

(provided by Sheffield Teaching Hospitals NHS Trust)

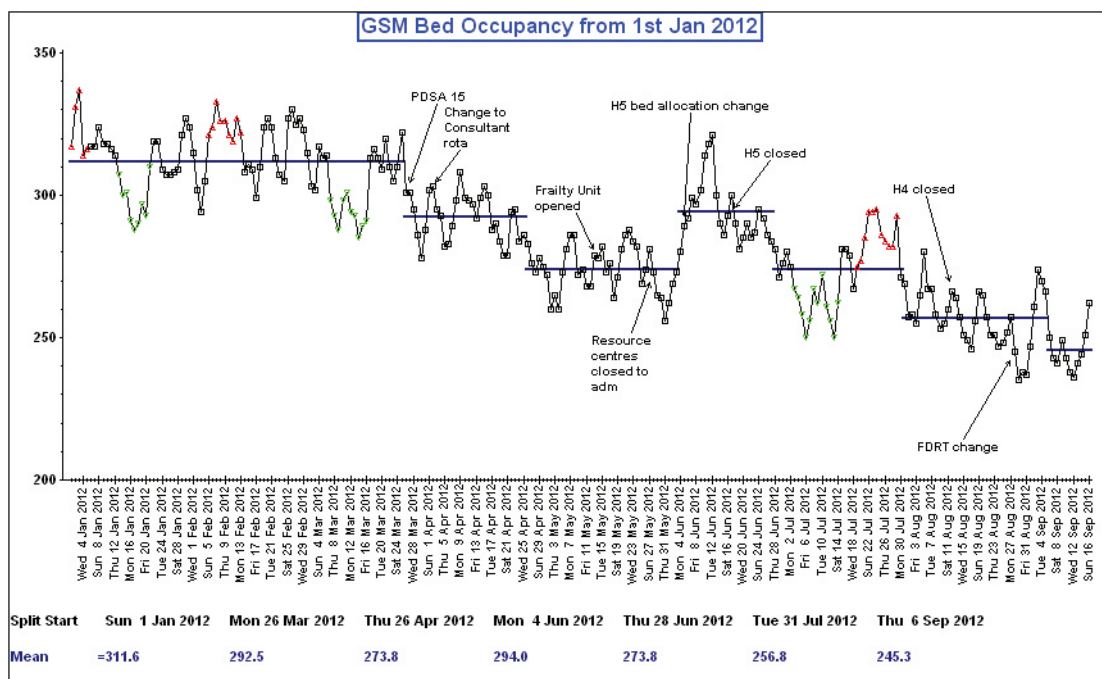


The changes have produced significant results in terms of bed occupancy (the product of the number of admissions, discharges and length of stay (Figure SH8)). This has reduced from a mean in January 2012 of 312 (max 337) to a mean in early September of 246 (lowest point 235). During this period the trust was able to close two wards, totalling 68 beds. Without the changes in geriatric medicine, these would have remained open. In addition, one geriatric medicine consultant retired and was not replaced. The cost associated with running a ward is typically quoted at around £1.5m and the full year effect of the financial cost saving/avoidance is therefore estimated to be in the region of £3.2m.

‘During the period from June to mid-September, geriatric medicine lived within its allocated bed complement for the first time that we can recall.’ (Paul Harriman)

Figure SH8: Geriatric medicine bed occupancy rate and associated tests of change

(provided by Sheffield Teaching Hospitals NHS Trust)

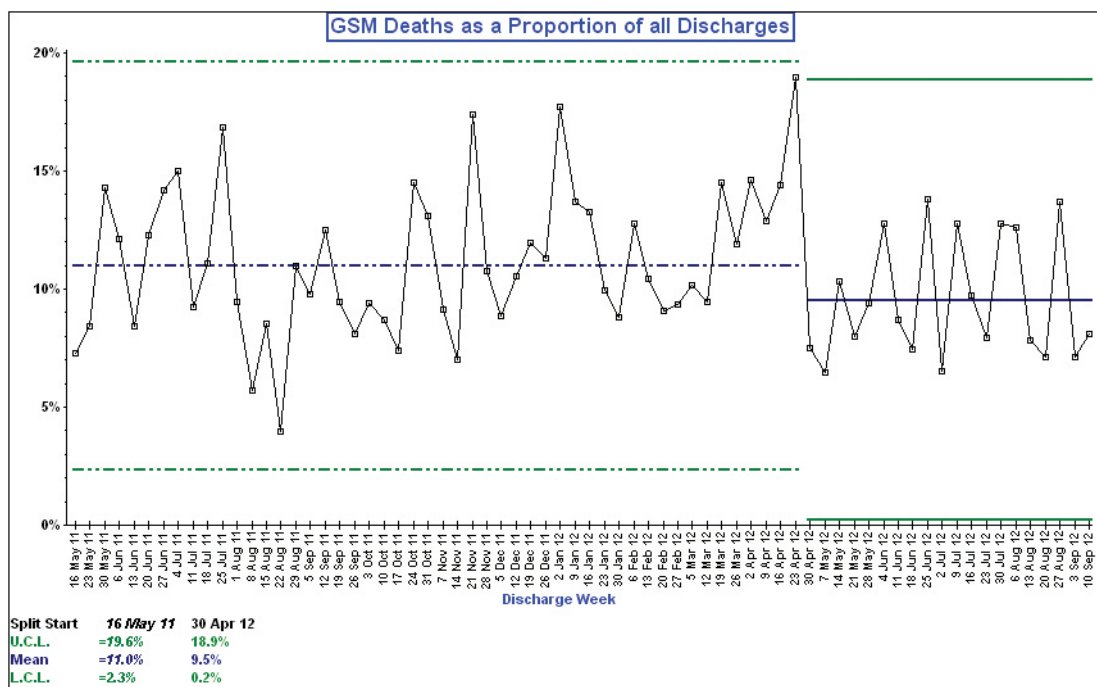


'What we've seen here is that we can have a slicker service that is not going to be as expensive to deliver and in fact will give better outcomes for the patients.' (Peter Lawson)

The Sheffield team report that deaths among this patient group (measured in the trust by raw mortality rates) appear to have fallen since April 2012 from a relative constant of 11% (past two to three years) to 9.5% (Figure SH9). This suggests a relationship between improving patient flow and improving patient safety.

Figure SH9: Deaths (emergency geriatric medicine) as proportion of all discharges

(provided by Sheffield Teaching Hospitals NHS Trust)



During late September the wider health community in Sheffield experienced major problems with patient flow. Patients were unable to access care support in a timely manner and this resulted in increasing delays to discharge, as well as an increase in patients whose admission was for purely social care reasons. This, in turn, had an immediate impact on A&E attendances and their ability to meet the four-hour target.

The hospital never fully recovered from this before the onset of flu, black ice, norovirus and other issues associated with winter, meaning that the bed count returned to previous levels. However, they hypothesise that without the improvements in the earlier part of the year, they would have been in a worse position today.

'The Flow, Cost, Quality work has had a beneficial effect in that we better understand what has caused the system to malfunction and that the teams are now enabled to address the issue across the whole city. We have started to see some of that solution coming on stream.' (Paul Harriman)

Continuous improvement

Despite their successes, the team are not complacent. They know they have further work to do on their internal processes, and that they need to improve communication across departmental silos and external links with other parts of the patient pathway, in order to further increase patient flow. Planned structural changes to update the environment of the Frailty Unit should further improve patients' experiences.

'The programme has achieved things here that we would never have achieved without it. The majority of people in this directorate can see exactly how it has improved things and can see that we don't stop here – we carry on.' (Peter Lawson)

The Oobeya (big room) process is now being used to work on accelerating discharge from the geriatric medicine 'base' wards in the bulk of the hospital. The team are working towards further improving the system design to achieve 'discharge to assess' at home and spread implementation downstream to the geriatric medicine base wards and beyond. Working in the 'big room' with community colleagues, the community teams have now redesigned to a point where they can accept referrals for assessment at home in real-time. Ultimately they aim to implement this to the community intermediate care beds.

Once the flow through and out of geriatric medicine base wards is improved, the team anticipate being able to reduce both the number of beds and the number of MAUs. Other clinical directors are interested in the results being achieved and the geriatric medicine team are keen to spread what they have learnt.

'I feel now it's really gained momentum. We now seem to be engaging more and more clinicians in the organisation, and more and more clinical teams. People are excited.' (Suzie Bailey, Service Improvement Director)

Key learning/insights

1. Use different strands of expertise

Working with complex change and applying improvement techniques requires expertise. The Sheffield team had access to that through working with Kate Silvester and the Health Foundation's programme. One of the key advantages of having an external viewpoint was in facilitating the work needed across organisations and agencies, such as improving discharge for frail older people.

The team also benefited from internal knowledge and skills, including those of consultant Tom Downes. Tom had recently completed the Health Foundation's Quality Improvement Fellowship with the Institute for Healthcare Improvement (IHI).

'Within any organisation wanting to do this work, there needs to be a cohort of people switched on and who understand the aims and methodology. Tom came back from the IHI and was able to really communicate what we were trying to achieve. He had worked in our system so he understood the frustrations and limitations and put them into context. He helped us pick apart our processes to address the key issues.' (Peter Lawson)

2. Build internal capability

The Sheffield team realised that for the work to be sustainable, they needed to grow improvement expertise among a wider group of staff. They needed to identify people keen to make changes and give them the time, knowledge and skills to do it properly. A key part of the ongoing work of Sheffield's service improvement team, and the big room process, is improvement coaching for staff at microsystem (clinic or ward) level. This is enhancing local ownership and enabling staff to run and report on their own tests of change.

'We've got projects delivering change that is benefiting patients and efficiency. That's really helping to embed quality improvement deeper into the organisation.' (Tom Downes)

A range of staff, including nurses, managers and doctors, are also being supported through a microsystem coaching academy, as part of the Health Foundation's Shared Purpose improvement programme. See www.health.org.uk/areas-of-work/programmes/shared-purpose/related-projects/sheffield-microsystem-coaching-academy/

3. Keep focused on patients and data

'Data on their own can be quite dry and un-engaging; patient stories on their own can just be dismissed as anecdote. But combine the two together and it can be incredibly powerful.' (Tom Downes)

The Sheffield team have been rigorous in collecting and analysing data to ensure that the changes they make are achieving the desired effect. Openly sharing data – much of which crosses organisational silos – has enabled staff to learn from both 'failures' and success.

Alongside this, the team have maintained a constant focus on what matters to patients and what needs to be better.

'I always took it for granted that we would be focused on the patient but every meeting starts with a patient story. It brings everybody in the room around to remembering why we're there and why we are trying to improve the service.' (Peter Lawson)

The team have used a variety of methods to keep focused on patients. Different staff volunteer to bring a story to each flow meeting – usually about the experience of a recent patient who has been in hospital. Patients have also been directly involved in coaching sessions.

Early on in the project, the team also created a case study around a fictional patient – 'George' – which helps them keep focused on the needs of patients when they are redesigning processes. As part of engaging senior leaders in the work, the team have taken board members to geriatric medicine wards to listen to patients' views about their care.

4. The power of small-scale testing

Testing out new ideas on a small scale has enabled the Sheffield team to achieve some major changes, while keeping staff engaged and taking ownership. All 16 geriatric medicine consultants changing their on-call rotas on the same day, to extend work into the evenings and weekends, is a clear example of this success.

On a larger scale, the focus on improving flow in emergency and routine care for older people is generating wider learning for the trust.

'The beauty of what's being sorted out in the big room for older people is that it's applicable to other patients – eventually it will be rolled out for whole healthcare system.' (Peter Lawson)

'Sheffield Teaching Hospitals NHS Trust is a big organisation with 15,000 employees in over 70 professions. The system's engineering principle of breaking the organisation into smaller components, not by function (ie traditional organisation structure) but by identifying fractals of the 'flow level' proved invaluable. This reflects learning from manufacturing, where factories and their supply chains are managed as value-streams that serve particular customers with particular needs. This principle of lean thinking has the advantage of bringing staff from different functions together to focus on the one thing that matters to them all: the patients in their care.' (Kate Silvester, Clinical systems improvement expert)