Improving patient handover between teams using a business improvement model: PDSA cycle

Background: Medical admission units are continuously under pressure to move patients off the unit to outlying medical wards and allow for new admissions. In a typical district general hospital, doctors working in these medical wards reported that, on average, three patients each week arrived from the medical admission unit before any handover was received, and a further two patients arrived without any handover at all. A quality improvement project was therefore conducted using a 'Plan, Do, Study, Act' cycle model for improvement to address this issue.
Method: P – Plan: as there was no framework to support doctors with handover, a series of standard handover procedures were designed. D – Do: the procedures were disseminated to all staff, and championed by key stakeholders, including the clinical director and matron of the medical admission unit.
Results: S – Study: Measurements were repeated 3 months later and showed no change in the primary end points. A – Act: The post take ward round sheet was redesigned, creating a checkbox for a medical admission unit doctor to document that handover had occurred. Nursing staff were prohibited from moving the patient off the ward until this had been completed. This later evolved into a separate handover sheet. Six months later, a repeat study revealed that only one patient each week was arriving before or without a verbal handover.
Conclusions: Using a 'Plan, Do, Study, Act' business improvement tool helped to improve patient care.

Introduction

The medical admission unit is usually very busy. It typically functions as a short stay ward where patients with suspected acute medical problems seen in primary care or the emergency department are assessed, treated and either discharged home or transferred to a medical ward for further care. Owing to nationally instituted targets associated with patient stay in the emergency department beyond 4 hours (Department of Health, 2000; Guly and Higginson, 2011), there is continuous pressure to move patients off the medical admission unit to allow for new admissions. As a consequence, patients in the medical admission unit risk being moved off the ward without an opportunity for appropriate handover.

The quality of patient handover is now of growing concern within the NHS following the implementations of the European Working Time Directive for doctors in training where reduced working hours has lead to increasing shift patterns. In the General Medical Council's 2012 national survey of doctors in training, one in four of all doctors expressed that arrangements for handover are either informal or not in place at all. The Royal College of Physicians and the British Medical Association have both released documents related to handover (British Medical Association, 2004; Royal College of Physicians, 2011). They express how effective handover optimizes patient safety during changes between clinical teams, reduces duplication, and is an effective teaching and learning opportunity.

The hospital in which all authors were working has a 34-bed medical admission unit ward. This did not have a standard process for handover, which raised concerns about patient safety. Initially a survey was conducted that asked doctors at this hospital about their experience of handover between the medical admission unit and a general medical ward (*Figure 1*).

A total of 21 responses were received from medical ward doctors and eight responses from medical admission unit doctors. On average, each week, three patients arrived onto a general medical ward before any handover was received. A further two patients arrived without any handover at all. Ward doctors felt rushed to receive handover on half the occasions. With patients moving so quickly at times, medical admission unit doctors reported they had never even met a third of patients they were expected to hand over. Often handover was left as the last job of the day – a third of all handovers occurred after 4 pm, with the day shift finishing at 5 pm. Ward doctors would subsequently be expected to stay after hours to carry out tasks resulting from late handover, extending the working hours for trainees.

Figure 1. Questionnaire exploring the handover experience between the medical admission unit doctor and the medical ward doctor.

Ward doctor questionnaire

1. How many verbal handovers from the medical admission unit team have you received this week?
2. How many times this week has a patient arrived to the ward during working hours (9–5 pm)
   a. before a verbal handover?
   b. without a verbal handover?
3. a. How many times this week have you received handover from the medical admission unit team after 4 pm?
   b. How many times have you been requested to do a job for the patient (review/chase blood test/chase investigation result/handover to on-call) after 4 pm?
4. How many times this week have you felt rushed to receive handover by your ward seniors (for example during ward round)?

Medical admission unit doctor questionnaire

1. How many verbal handovers to the ward have you done this week?
2. How many times did you handover a patient without actually meeting the patient on the post take ward round?

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The authors subsequently carried out a quality improvement project that aimed to improve patient handover between the medical admission unit and the medical wards. Several tools within the Medical Leadership Competency Framework were used, as set out by the Institute for Innovation and Improvement and the Academy of Medical Royal Colleges (2010). This framework defines the leadership competences that doctors need in order to become more actively involved in the planning, delivery and transformation of health services, skills which are now an integral part of a doctor's training.

The primary objective was to ensure that all patients transferred to a medical ward had a clear handover before transfer, and the secondary objective was to increase trainees' satisfaction in relation to the patient's handover practice.

Method

A 'lean thinking' tool for improvement was used: the 'Plan, Do, Study, Act' cycle (Lord and Smith, 2012).

Plan

A series of standard handover procedures was designed that directly addressed the negative outcomes of the survey and aimed to improve the handover process.

The four standard procedures to support doctors with handover are outlined in *Figure 2*.

Figure 2. The four standard procedures designed to support handover between the medical admission unit and the medical wards.

1. The general medical team should know the name and medical problems of every patient who is coming to their ward before their arrival
2. Ward doctors must be supported by consultants in taking time to receive handover
3. A patient should be handed over only by a doctor who met the patient on the senior led post take ward round or has received a clear handover from the reviewing senior
4. The medical admission unit team retains responsibility for the patient until the next day if a patient moves to the ward after 4pm. Any outstanding tasks should be undertaken by the medical admission unit team, unless the ward team are happy to help

Do

The authors began by carrying out a stakeholder exercise, identifying all the people needed for support. This included all the consultants, junior doctors and nursing staff working in the medical department. A publicity campaign was undertaken advertising the standard handover procedures which included face-to-face communication, group presentations, posters and emails to all stakeholders.

A SWOT analysis (assessment of the strengths, weaknesses, opportunities and threats) was carried out to help the authors to determine the weaknesses and threats. For example, the authors aimed to overcome the inertia that so often limits change through the support of the clinical director of the medical admission unit, the medical director of the hospital and the matron of the medical admission unit – they chaired meetings with other staff members and distributed group emails to the medical department endorsing the need for handover quality improvement and the potential effectiveness of the standard handover procedures.

Results

Study

Three months later, the survey was repeated. Only 13 responses were received from medical ward doctors and six responses from medical admission unit doctors. This revealed that ward doctors now almost never felt rushed to receive handover and that they were carrying out jobs after 4 pm for only a quarter of the cases. However, medical admission unit doctors reported they had still never met a quarter of the patients they handed over. In addition, there was no change in the average number of patients arriving each week before (three patients per doctor) and without (two patients per doctor) a handover.

Act

As the four standard handover procedures had had limited effect, new tools were introduced based on the feedback obtained from doctors and nurses. The authors realized that the gatekeeper for transfer of the patient off the medical admission unit was the 'post take ward round' sheet, a document completed by the medical admission unit team following the assessment of a new admission onto the unit by a consultant – only with its completion could the nursing staff plan transfer.

This sheet was therefore redesigned to include a check-box documenting that handover had occurred (*Figure 3*), and prohibiting transfer of a patient without its completion. This was again supported and publicised by the key stakeholders. As handover principles became embedded into hospital culture, a separate handover sheet later evolved which included a traffic light signal dictating the urgency of handover tasks post transfer: red – immediately, yellow – same day, green – next day (as outlined in the Royal College of Physicians (2011a) Handover Toolkit). This allowed doctors to plan handover.

Re-study

The procedure was re-measured 6 months later and received 15 responses from medical ward doctors and five responses from medical admission unit doctors using the same questionnaire as before. The results were more impressive – on average, one patient each week arrived to the ward before a verbal handover, and one patient without a verbal handover at all (*Figure 4*). Medical admission unit doctors had met or received a senior handover of almost all patients before performing a ward hand over. Ward doctors almost never felt rushed to receive handover (*Figure 5*). (Surprisingly, ward teams were asked to carry out jobs for medical admission unit teams more frequently.) Although not formally measured, the verbal feedback from junior doctors regarding handover was also more positive.

Discussion

Hospitals are always under pressure to respond to targets. To avoid the penalties associated with prolonged stay in the emergency department, the medical admission unit is constantly under pressure to move patients off the unit to outlying medical wards to allow for new admissions.

A survey exploring the experience of handover between the medical admission unit and medical wards revealed that handover was poorly performed, raising concerns about patient safety. The latest General Medical Council (2012) survey highlighted lack of effective handover as one of the main concerns fed back by medical trainees.

Figure 3. The new patient handover sheet – includes a list of all outstanding tasks with a traffic light signal scale of urgency, and a check-box documenting that handover has occurred.

Handover-Transfer

Patient ID
Name DOA Consultant……..
DOB
Hospital No.
NHS No.

Diagnosis- Main….
- Other relevant……

Clinical highlights- (e.g. low BP, BIPAP, risk of falls …..etc.)

Flagging–Please tick as appropriate.

RED	AMBER	GREEN
Needs Doctor r/v ASAP as reaches to destination ward and do task.	Needs Doctor r/v within same shift duty and / or do task	Stable patient seen by consultant today. Needs next day review and task.

Task and follow up-(e.g. ABG, bloods, imaging, chase results, action plan etc.)
1. .
2. ..
3. …
4. ….
5. …..

Escalation- Full escalation , DNAR, Ward Based Ceiling (please tick as appropriate)
Other(specify LCP etc.)……..

Handover From-	**Handover To –**	Received verbal handover too? Yes / No
Location……	Location……	
Signature……	Signature……	
Time & Date……..	Time & Date……	Consultant in-charge
Bleep……..	Bleep……..	……
Position……	Position……	
Name……	Name……	

(*Nurse in charge of patient please inform to the Handover champion Doctor(see on board) on duty, on each transfer of patient "From your care" (inform before any physical transfer) or "To your care"(inform once you receive the patient) . It is related to patient safety, quality and clinical governance. Thank you to all for your co-operation)

A quality improvement project led by a trainee and based on competencies laid out in the Medical Leadership Competency Framework was conducted to address this concern. A 'lean thinking' model for improvement known as the 'PDSA' cycle was followed. Lean thinking is an 'improvement approach' that aims to 'improve flow, eliminate waste and reduce delays'. This approach was originally modelled in industry and later used to improve quality within health care (NHS Institute for Innovation and Improvement, 2006).

The following are the steps of a PDSA cycle (Lord and Smith, 2012):

- Plan: determine the improvement objectives and design a strategy to achieve these objectives
- Do: undertake the planned strategy and collect results on a small scale
- Study: analyse the results and compare them to the objectives
- Act: undertake corrective actions to improve the differences between the analysed results and objectives.

The key feature of the cycle is that it recognizes that the objectives of a project are rarely accomplished first time round, and encourages learning from the errors of the first attempt.

A SWOT analysis explores the strengths and weaknesses of an improvement strategy, its opportunities for improvement, and the

Figure 4. A graph comparing the data gathered at month 0 (background survey), month 3 (completion of PDSA cycle 1) and month 9 (PDSA cycle 2 – restudy), and the respective number of patients per doctor that arrived to the ward either before or without verbal handover.

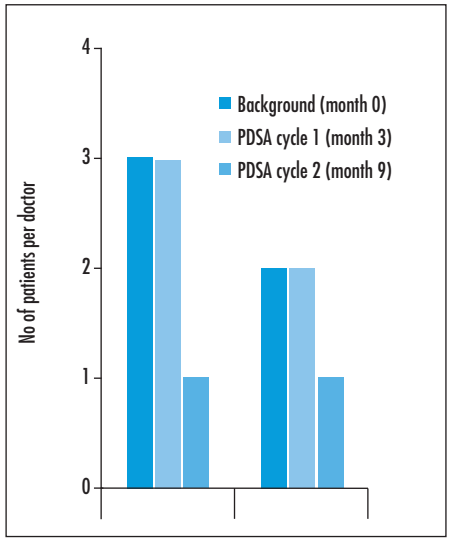
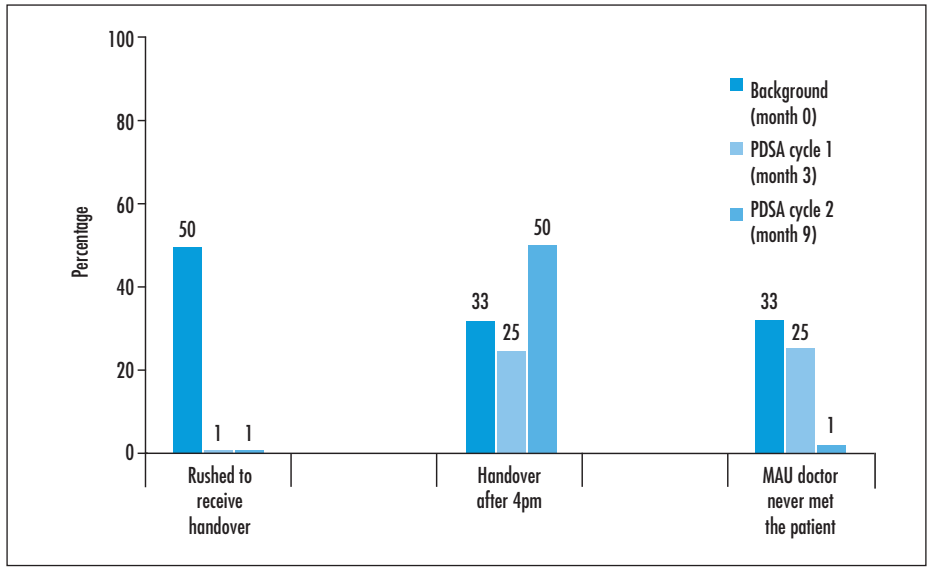


Figure 5. A graph comparing the data gathered at month 0 (background survey), month 3 (completion of PDSA cycle 1) and month 9 (PDSA cycle 2 – restudy), and the percentage of ward doctors who felt rushed to receive handover from the medical admission unit, of handovers received by ward doctors after 4pm, and the number of medical admission unit (MAU) doctors who had never encountered the patient they handed over.



threats to its survival. This allows one to consider, before starting a project, where the problems inherent within the 'plan' lie and how to tackle these (Mind Tools, 2007). A key threat recognized in this project was 'resistance to change', and this was targeted with a stakeholder analysis. A stakeholder is anyone recognized as being an advocate for an objective (NHS Institute for Innovation and Improvement, 2008). A stakeholder analysis can identify these people (usually through a brainstorming exercise) and categorise them in order of importance (and where one's attention should lie).

The authors began by constructing four standard handover procedures to support doctors in the handover process. These were championed by advocates from senior clinical management (the clinical director of the medical admission unit, the hospital medical director and matron of the medical admission unit). This later evolved into a formal handover sheet, which included a check-box documenting that handover had occurred, and prohibited transfer of a patient without its completion. The authors managed to overcome the resistance to change that so often threatens progress, and improve quality of handover so that it not only improved patient care but also improved doctors' work and training. There were still cases of patients who have been moved without handover. The reasons are currently being monitored and solutions are being introduced to act on deviations.

The effects of projects led by trainees and directed towards trainees frequently die out as the trainees move to other positions of training. Education as a means of implementing change can only last as long as those doctors remain in the same position. In their executive summary 'Learning to Make a Difference', the Royal College of Physicians (2011b) stress that in order to sustain quality improvement by doctors in training, the implementations must be championed by a quality improvement consultant. Having the support of the most influential people in the medical admission unit allowed the use of the signed handover sheet to become a standard procedure, embedded in hospital culture, helping to ensure sustainability. This demonstrates the importance of an effective stakeholder exercise.

The authors used doctors' feedback as a measure of patient care, but did not include the opinion of the patient in this project. Surveying patient opinion before and after the intervention would have informed the authors better about the quality of care offered to patients.

The improvements demonstrated are based on small sample sizes, limited to the availability of doctors within a single district general hospital. In addition, the doctors assessed each time changed as they rotated to different specialities every 3 months. Assessing the effectiveness of this handover process in more hospitals with doctors working within 6-month rotations would be of value.

It is noticeable that despite the new handover policy, one patient still moved to the ward before and without handover. The lead author left the hospital (end of rotation) before completing the project so was unable to further encourage adherence to the new handover protocol first-hand which may have further improved the outcome.

Conclusions

Effective patient handover optimizes patient safety and ensures continuity of care. Trainees have highlighted that the current state of handover is of concern. Where this is perhaps most obvious is the 'medical admission unit – medical ward' handover, where targets drive rapid patient flux out of the medical admission unit. In a trainee-led project, guided by the skills learned within the Medical Leadership Competency Framework, a PDSA cycle has been successfully completed to improve handover within the authors' medical admission unit. The authors urge other trusts to use these skills within their workplace. **BJHM**

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Conflict of interest: none.

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LEARNING POINTS

- The Medical Leadership Competency Framework highlights the skills and tools doctors must learn in order to plan, deliver and transform the future health service.
- The General Medical Council's 2012 national survey of doctors in training found that one in four of all doctors expressed that arrangements for handover were either informal or not in place.
- The 'Plan, Do, Study, Act' cycle was used in this project to improve patient handover between the medical admission unit and outlying wards as it recognizes that the objectives of a project are rarely accomplished first time round, and encourages learning from the errors of the first attempt.
- Focussing on the weakness and threats in the planning phase of a quality improvement project (as part of a SWOT analysis) is essential to pre-empt problems inherent within the plan and design solutions to these.
- A stakeholder is anyone recognized as being an advocate for an objective – an effective stakeholder analysis was critical in this project as it identified the most influential individuals who helped guide its initial success and ensure its long-term sustainability.