

BMJ Open Quality Making the weekend work: a local quality improvement project to establish and improve the quality of weekend handover

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ABSTRACT

Handover is widely identified by the National Confidential Enquiry into Patient Outcome and Death, the Royal College of Physicians (RCP) and Health Foundation as an area that can lead to shortcomings in patient care. We recognised that the current weekend handover process in the Trauma and Orthopaedics department at Frimley Park Hospital was dated, time-consuming and did not promote handover of sufficient patient details.

The Royal College of Surgeons, British Medical Association and RCP have guidelines on handover. Our aim was to use these to establish the quality of handovers and introduce methods to better the accuracy and effectiveness of weekend handover in the department, thus improving patient care and safety.

Initially, we measured the quality of the existing handover documentation for how comprehensively it was completed. We then implemented a two-step change, reauditing each step, resulting in a handover tool on the trust intranet. Finally, we repeated our audit to monitor sustainability. The 10 categories measured were: 'Patient name', 'Date of birth', 'Hospital number', 'Date of admission', 'Location', 'Consultant', 'Admission reason', 'Date of operation', 'Frequency of review' and discharge paperwork ('TTO'). The original handover documentation had good compliance with 'Patient name' (99%), 'Hospital number' (94%) and 'Admission reason' (91%) but was poor in all other categories, ranging from 12% to 84%. The only category that met its standard was 'Admission reason'. Almost every category improved with the new intranet tool. Five areas met their standard ('Patient name', 'Location', 'Consultant', 'Admission reason' and 'Frequency of review'). Specific prompts resulted in 100% compliance for 'Frequency of review'. The poorest compliance was again seen for 'TTO' (18%).

In a short four months, we created an intranet handover tool that resulted in significant and sustainable improvements in the quality, detail and accuracy of handovers, making identification of sick patients safer and more efficient.

PROBLEM

Frimley Park Hospital is a 750-bed National Health Service hospital in Surrey, near the Berkshire and Hampshire county borders. The Trauma and Orthopaedics (T&O) department consists of approximately 25

consultants, shared between six teams of specialty trainees, core trainees and foundation year one doctors.

As newly qualified doctors, we anticipated some jobs to be time consuming initially, which would improve as we adjusted to the role. However, as time went on, the weekend handover process became a repetitive issue.

The existing weekend handover process was a Microsoft Word table saved on a shared departmental computer drive. On Friday afternoon each team would add patients who required weekend reviews onto the handover document. Due to time constraints, busy ward jobs and preparing for the weekend, handover documentation was written in a rush, often with errors or lack of details; further exacerbated by the lack of multiuser, simultaneous access. This was potentially detrimental to patient care as well as creating additional workload for the on-call team.

Looking at guidelines on patient handover from the Royal College of Surgeons (RCS), the Royal College of Physicians (RCP) and the British Medical Association (BMA), we knew our handovers were inconsistent and had room for improvement.¹⁻³

The primary aim of this quality improvement (QI) project was to use national guidelines to identify key elements to a handover, create methods to enhance the quality and effectiveness of weekend handover and subsequently improve patient care and safety in the T&O department within a four-month foundation doctor rotation.

Our aim would be achieved through two main objectives: to produce a more intuitive and user-friendly tool to facilitate handover and, in doing so, improve compliance with documentation against set standards (described in the 'Measurement' section) from as low as 35% to between 90% and 100%.

BACKGROUND

Hospital doctors are increasingly working in shift patterns, leading to less continuity for patients, thus shift work relies on effective and accurate information transfer. Failure in this handover process is a preventable cause of patient harm² and has been widely identified by the National Confidential Enquiry into Patient Outcome and Death, RCP and the Health Foundation as a high-risk step.^{2 4 5} Both human factors around poor communication and systemic errors in handover are at fault for this.

A 2010 RCP survey⁶ found that handovers were most commonly from consultants to juniors, once or twice within 24 hours (69% and 66%, respectively). Of those surveyed, only 33% agreed that handover was done well and 38% had received induction on the handover process.

As the most junior members of the team, we have both added patients to the weekend handover and used it when on-call. We noticed that weekend handover documentation was variable in accuracy and level of detail, which made it difficult for the on-call team to safely identify sick patients and effectively prioritise jobs.

Taken together with published guidelines and the RCP survey, we felt that there was a lot of scope for improving weekend handover. If done well, handovers can recognise unstable and unwell patients and ensure they are reviewed and managed appropriately.

Upgrading to an electronic handover process has repeatedly been shown to improve the standards of patient handover.⁷⁻¹³ This includes clearer handover instructions, better retention of patient information and increased compliance with guidelines. However, moving to an electronic system is not foolproof as the issue of human factors still remains, for example, 'free text' options.^{14 15} Creating a more formal system for patient handover should help maintain the standards recommended in several guidelines and help reduce the influence of human error.¹⁶

As we approached the end of our rotation in T&O, we had familiarised ourselves with the variety of systems used across the hospital in other specialties. The medical department had an intranet tool that uses 'free text' and drop-down boxes, as well as allowing live, simultaneous access. Following conversations with medical colleagues, it was evident this method was easy and efficient, both to enter data into and to work from. As our handover process was already computer based, we felt it was important to remain so to ensure uptake of the intervention, which has been shown to be a problem in previous projects of a similar nature.¹⁷ These positive findings provided a starting point for our weekend handover project.

MEASUREMENT

Combining guidelines from the RCS, RCP and BMA, we identified 10 key components to a good handover: 'Patient name', 'Date of birth' ('DOB'), 'Hospital number', 'Date of admission', 'Location', 'Consultant', 'Admission reason', 'Date of operation', 'Frequency of

review' and 'TTO' ('to take out'; referring to any mention of discharge paperwork).

We established a baseline on weekend handover documentation by collecting retrospective data for nine weeks. A total of 247 patient handovers were included, averaging at 27 handovers per week. For each weekend, we recorded the total number of patient handovers, and then analysed each individual handover to identify which of the 10 components were documented.

We then implemented the first of our two-step intervention by amending the existing table on Microsoft Word with additional columns. This was an intermediate stage while we developed the intranet handover tool. We collected data prospectively for eight weeks using the same method, measuring compliance with the amended handover table. A total of 257 patient handovers were included, averaging at 32 per week.

We then introduced the weekend handover tool, available on the trust intranet. Prospective data were collected over nine weeks, with 207 patient handovers, an average of 23 per week. We repeated analysis of the new handover tool after a further four months collecting a total of 201 patient handovers, averaging at 22 patients per week.

DESIGN

The existing handover tool was user dependent and lacked prompts to facilitate the documentation of appropriate patient information. It was mostly used by the foundation trainees who all shared the same frustrations of: varying quality of weekend handover; lack of multiuser access; and difficulty in prioritising jobs for unfamiliar patients.

Although we did not anticipate the end result of our QI project, we started by drafting a table with three additional columns (TTO, day to be seen and 'do not attempt resuscitation' (DNAR) status) and showed it to our junior colleagues, who welcomed trialing methods to improve our handover process.

We introduced the modified weekend handover document, while collecting data on the preceding nine weeks to establish a baseline. This was not a definitive answer, as simultaneous access remained a problem and so we investigated how other departments throughout the hospital conducted weekend handovers and came across an intranet tool used by the medical team. This answered our problem to simultaneous access. We showed our colleagues the system and pitched it as the basis of our handover tool.

A group discussion around the current and modified handover document took place. Its benefits and disadvantages compared with systems used by other teams, and how those could be adapted to suit our department were taken into consideration. In particular, our colleagues felt the 'Day to be seen' column was most beneficial in prioritising workload at the start of the weekend and so was crucial to include in our final product. With their feedback and support, we approached the in-house web

developer with our idea and created a tool that was suitable for the T&O department.

We also consulted the whole department when we presented our findings at the monthly Clinical Governance Meeting. We were very encouraged by their positive responses, especially as some consultants were not even aware of the outdated method we were using. We were also advised to survey the current members of the T&O department regarding weekend handover to compare with the 2010 RCP survey.

We have since created a document with detailed instructions and screenshots, showing how to access and use the intranet tool. This has been distributed to the department to encourage more senior members of the team to engage with it, and is provided to new doctors at their induction.

In a short four months, we identified an area for improvement and completely changed the weekend handover process in the T&O department.

STRATEGY

Our aim was to improve the quality and effectiveness of our weekend handover. We assessed our performance by setting standards for each of the 10 categories that should be included in a good handover (online supplementary file 1). Some critically important patient identifiers had standards set at 100%. We undertook two rounds of intervention, reauditing at each step and a further audit to monitor for sustainability.

We completed two full ‘Plan Do Study Act’ (PDSA) cycles^{18–20} in this two-step intervention project.

PDSA cycle 1

Aim: To establish baseline accuracy of the existing handover document, measuring compliance in keeping with the standards set out against national guidelines, and creating methods to improve handover.

Intervention: We introduced an additional three columns to the existing handover document (‘TTO’, ‘Day to be seen’ and ‘DNAR’) to facilitate and prompt better documentation.

Outcome: Using the same method as for baseline measurements, we collected quantitative data on the accuracy of the amended handover document. Despite an increase in compliance, most categories were still failing to meet their standards. ‘TTO’ had more than doubled to 31% and ‘Frequency of review’ had increased from 70% to 79%. No data were collected on ‘DNAR’ as the column was rarely completed and the guidelines did not specify this as a core component for handover.

The updated document had nine columns to complete for each patient, which peers suggested was dull and daunting and so likely to result in poor compliance. The design and layout was basic with simple headings and ‘free text’ boxes to complete. It lacked an intuitive feel to aid easy completion and relied on dedicated and committed entries with no helpful prompts or autofill boxes (eg, drop-down boxes, autoselect dates).

PDSA cycle 2

Aim: Reflecting on data and feedback from PDSA cycle 1, we set out to create a more definitive, user-friendly and sustainable method of handover.

Intervention: We introduced a new intranet-based handover tool (figure 1).

Figure 1 Intranet handover tool.

Outcome: Most categories saw a further increase in compliance, with four now meeting their standards and 'Frequency of review' achieving 100%. Reauditing confirmed sustainability, achieving similar results, with seven categories continuing to increase in compliance.

The handover tool consisted of 10 boxes, including three drop-down boxes and a calendar date selector. Six were 'free text' boxes and three required minimal input: patient details ('Patient name', 'Hospital Number', 'DOB'), 'Consultant' and 'Location'. We eliminated a column for 'TTO' as compliance remained poor (31% after the first intervention), and guidelines had not specified it to be a core component for handover.

The altered, more aesthetically pleasing and accessible layout made the handover process more straightforward.

RESULTS

Our standard throughout this project was that all handovers should provide information on: patient demographics (as described in the 'Measurement' section), current admission, medical details and investigations/plans (online supplementary file 2).

After our first intervention, all except one category had increased compliance compared with our baseline. 'Location' decreased from 84% to 77%. We believe this was due to the increased number of columns requiring data entry.

'Patient name' and 'Admission reason' were now meeting their standards at compliance rates of 100% and 97%, respectively. However, the majority of categories were still failing to meet their standards.

Following introduction of the intranet tool, compliance again showed an increase for the majority. Four categories met their standards: 'Location' (90%), 'Consultant' (94%), 'Admission reason' (97%) and 'Frequency of review' (100%). 'Patient name' and 'TTO' had dropped to 99% and 5%, respectively.

As foundation doctors rotate every 4fourmonths, we conducted a second round of data collection for the intranet tool with a new set of doctors, testing the sustainability. Again, it showed an increase across the board compared with our first set of data (figure 2). This showed that doctors who were not involved in the transition to the new intranet tool could achieve similar results (figure 3).

The three patient identifiers were at their highest compliance since data collection started: 'Patient name' (100%), 'Hospital Number' (98%) and 'DOB' (85%, previously 54% at baseline). Five of the 10 categories met their standards ('Patient name', 'Location', 'Consultant', 'Admission reason' and 'Frequency of review') and all except one ('TTO') were greater than 50%.

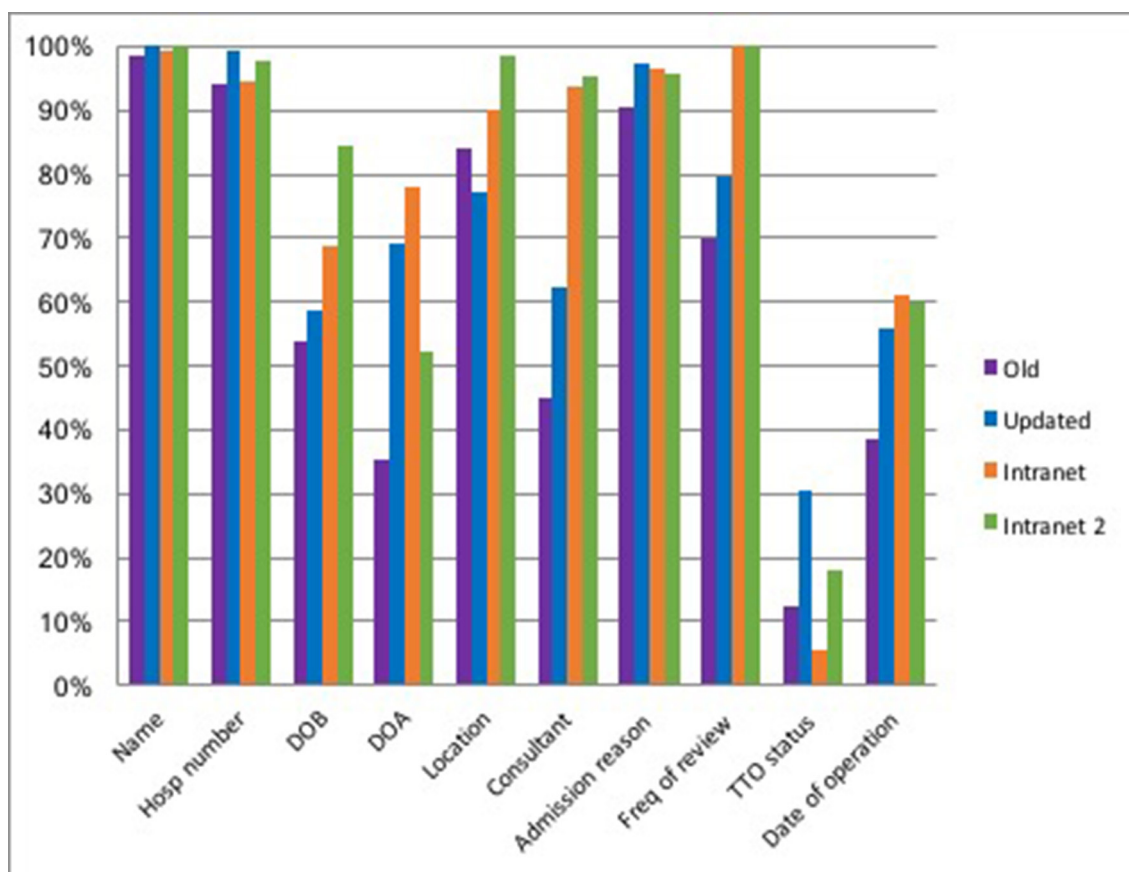


Figure 2 Graph showing percentage compliance of each of the audited parameters, comparing the original handover document ('Old'), the amended table with additional columns ('Updated') and the intranet handover tool's first ('Intranet') and second ('Intranet 2') cycles. DOA, date of admission; DOB, date of birth; TTO, to take out.

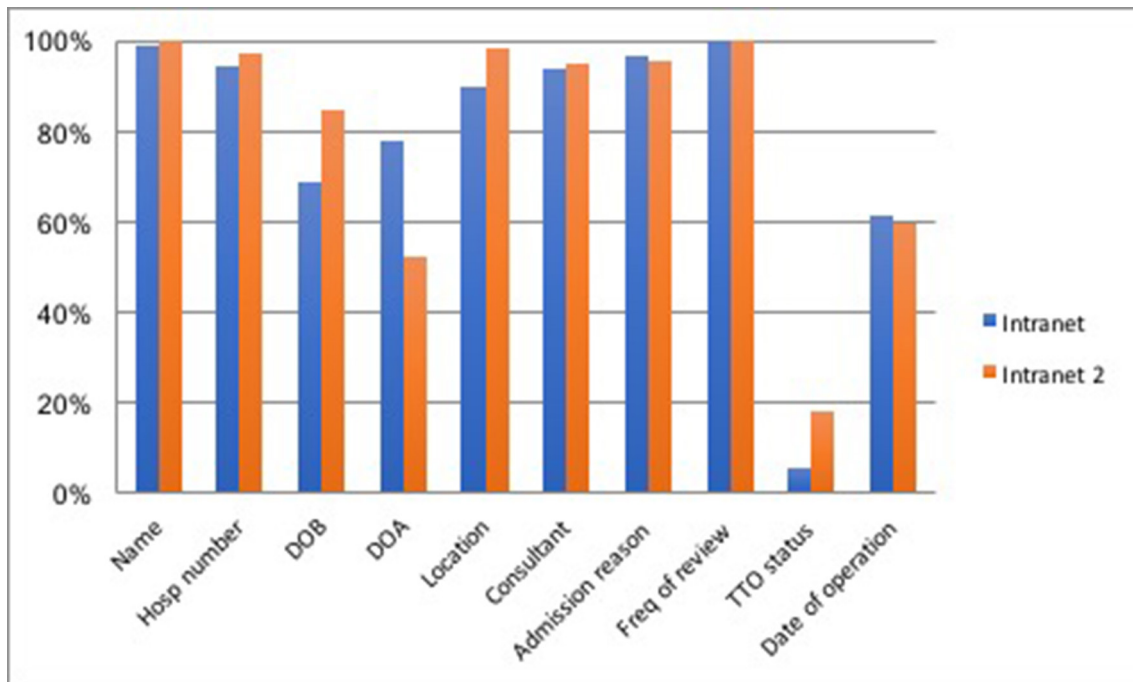


Figure 3 Graph comparing the compliance in use of the new intranet handover tool between two cohorts of doctors. DOA, date of admission; DOB, date of birth; TTO, to take out.

LESSONS AND LIMITATIONS

Our data collection involved objective assessment in a method similar to other QI projects, by scoring the quality of the handover before and after intervention.^{10 13} Other projects have involved purely subjective assessment with surveys of junior, and sometimes senior, doctors.^{11 15 21 22} Some projects achieved both objective and subjective assessments^{12 17 18} thus producing more substantial results. The objective element reduces the risk of bias and enables easier audit and comparison of data at future opportunities, while the subjective element better assesses QI in terms of doctor experience. Future project would be wise to include both objective and subjective assessments.

In PDSA cycle 1, our intervention included additional of the ‘TTO’ column to inform of either completed or outstanding discharge paperwork. Our intervention increased documentation of ‘TTO’ from 12% to 31%. However, this was still very poor and far from its standard. Following informal surveys of our colleagues, we decided to omit this from the final intranet tool. TTOs were irrelevant for the majority of patients entered onto the handover and so just made the process more time consuming and the final document more burdensome.

Other similar projects have referred to, and been limited by, the financial implications of developing an electronic handover process compared with an often free, paper-based process.^{11 15} We were fortunate to have an in-house web developer, allowing this to be a cost neutral project. This also significantly reduced the length of time our project took as we eliminated the need to apply for funding.

Although our handover tool is relatively simple and intuitive to use, we did not consider potential information technology problems¹⁵ that could have arisen. For similar projects, or any amendments to the handover tool, a simulation session or formal induction may be beneficial.

Presenting our QI project at our local Clinical Governance Meeting on 16 March 2017 brought to our attention that some doctors were unaware of the weekend handover process, while others did not know how to use the new handover tool or that it existed. We demonstrated how to access and use the tool, and encouraged all members of the department to use it, including core trainees, specialty trainees and consultants. This was especially important for late-finishing operating lists when the foundation doctor is unlikely to know the details of the operations, and patients can easily be missed off the handover.

Throughout the project, we surveyed fellow foundation trainees regarding: concerns with the existing handover document; usability and relevance following each intervention; and the balance between sufficient detail and having too many boxes to complete. However, the response rate was poor and we found that informal feedback was much more convenient. In future projects, it is worth considering generating a reproducible questionnaire, with validated scales (eg, Likert²³), to obtain qualitative and quantitative data, as other studies have done. However, problems with poor response rate may remain.

Very few QI reports of similar projects have described any assessment for the sustainability of their intervention. This was an aspect we felt very strongly about.

An intervention needs to become habitual and part of the routine for it to be continued. By reauditing a few months after the second intervention, we could assess for its sustainability and areas for potential change. Consideration must be made for the future as hospital team members change regularly, therefore a plan needs to be in place to ensure that information for the tool and best practice for handover is continually passed on. This was addressed by the creation of the instruction document and a further reaudit of the weekend handover tool to ensure sustained improvement.

Our project was awarded third prize when presented at a regional QI competition. We were asked whether we had collected data that directly related to patient safety, for example, number of NEWS (National Early Warning Score) calls (periarrest/priority/crash calls) before and after introduction of the new handover tool. Unfortunately, this was not considered at the start of the project, so we were unable to retrospectively make comparisons. However, if this project were to be repeated in another department or at another hospital, it would be advisable to collect data on a site-specific incident reporting tool, submitted for the relevant wards before and after intervention.

Lastly, many projects had relatively small sample sizes, in terms of the number of people surveyed,^{15 17 21} or the number of handovers analysed.^{10 18} The larger sample sizes of our project helped accommodate for any discrepancies between weekends and ensured that the data collected were true representation of the quality of handover documentation. These similar sized sample groups at each round of data analysis (range of patient handovers was 201–257) helped eliminate discrepancies between groups of doctors using the handover and any group bias.

CONCLUSION

A great deal of research preceded our project, looking at how and why handover is important. Following the introduction of the European Working Time Directive and the new junior doctors' contract (2016), patient-doctor continuity has significantly reduced. Therefore, handover has become a critical step in patient care. Transfer of information relies heavily on human factors, and we must be conscientious that when we are busy and tired, mistakes can happen, and careless handovers can lead to poor patient outcomes.

One objective of the project was to produce a tool that facilitated weekend handover, making it an easier and more efficient process. We did not predict what the final product would be. Instead, we analysed our data at each step, discussing the findings with our colleagues and taking on feedback. Over a period of four months, we created a handover tool that was user friendly and safer for the transfer of information correctly and accurately, via two PDSA cycles.

Sustainability was a key aspect to our project. We wanted to ensure that the tool we created was easy to use

and accessible to new and locum doctors. It was crucial to create a tool that was self-explanatory, and does not require extensive training prior to use. We completed the fourth round of data collection, with a new cohort of doctors using the handover tool, and achieved results very similar to that of our cohort. By distributing an instruction document to the department and human resources team, we can ensure that despite a changeover of doctors every few months, the handover tool will remain in use.

Going forward, we plan to survey the current users of the handover tool, identify any areas that can improve the user interface or handover process, reaudit to ensure sustainability and make appropriate changes in view of feedback. We would also like to extend our project to other surgical specialties that have a high patient load and multiple weekday teams, where the need for safe, detailed and accurate handover is vital for patient safety.

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