

Improving medical handover at the weekend: a quality improvement project

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Abstract

In recent years medical handover has been identified as an increasingly important area for hospitals to improve upon, in light of the changes in shift patterns for doctors. Significant changes to weekday handover had recently been successfully introduced at Broomfield hospital. Weekend handover remained a concern, with an electronic and paper system being used simultaneously.

Our objectives were to introduce a new electronic handover system for weekend handover at Broomfield Hospital and improve the organisation of the weekend handover meeting to promote patient safety.

Doctors involved in weekend handover were surveyed using a questionnaire, to establish insufficiencies in the weekend handover process; where both the electronic ExtraMed system and paper were being used inconsistently. A new weekend handover system was introduced together with a new user-friendly electronic handover database, addressing the identified difficulties in the current system. These changes met the medical handover guidelines set by the Royal College of Physicians. Three months after the launch of the new system, doctors were re-surveyed using a modified questionnaire to assess the impact our changes had made.

Before changes were implemented only 12% of doctors surveyed used the electronic system for weekend. Eighty-nine percent found sorting through jobs time consuming and 67% were handed jobs to them meant for a different grade of doctor. Only 41% were aware who to hand weekend discharges to. Subjective assessment of safety was 3.18 out of 5. The electronic system was felt to be time consuming and complicated.

After execution of the new weekend handover process, 100% of doctors reported using the electronic system for weekend handover. Only 47% of doctors felt sorting through jobs was time consuming and 89% of doctors were aware who to handover weekend discharges to. Subjective assessment of the safety of weekend handover improved to 3.84 out of 5. Informal interviews on the ward revealed a high degree of satisfaction with the new weekend handover system. In conclusion we found that a structured, well organised weekend handover meeting together with an effective electronic handover system improves the quality of medical weekend handover.

Problem

This project initially came about in 2009/10 when problems with medical handover at Broomfield hospital were identified by poor feedback from that year's GMC National Training Survey. This dissatisfaction with handover had already been identified at a wider level across the country by a study that found junior doctors felt existing handover arrangements were frequently not as good as they would have liked [1]. To look into this, a survey was conducted at Broomfield Hospital which identified a complete absence of structured handover between day and night shifts on the acute take, together with highly variable and unreliable practice among teams. In order to resolve these issues a new system of handover meetings was introduced in 2010. Morning and evening handover meetings on emergency assessment unit (EAU) were set up in order to handover patients admitted on the acute take. A weekend handover meeting on Friday afternoon was also initiated in the EAU doctors' office.

A repeat survey was performed three months after initiation of these changes to assess the improvement. A marked improvement in doctors' views on the quality of handover was shown by the results of this survey. To obtain a more formal assessment of the impact

made by these changes, an audit was performed in January 2012. This revealed that acute weekday handover occurred on 96% of occasions and confirmed a marked improvement. However, there remained two major areas of concern in weekend handover and the current electronic handover system (ExtraMed).

ExtraMed is an IT system implemented for mapping hospital beds and patient flow. It was not primarily designed to be used as a handover tool. The company made adjustments to the system at a later date after its initial implementation to allow it to be used for other tasks including weekend handover. However, the changes made were far too basic. They did not allow for many essential characteristics of an electronic handover tool such as ability to export a job list for on-call doctors, erase jobs already performed from the system or incorporate basic patient details. The system was also slow, unreliable, and prone to crashing with risk of loss of data. Despite multiple attempts to resolve these issues no progress was made.

Background

In recent years medical handover has been identified as an increasingly important area for hospitals to improve upon. This is at

least in part due to the increasing fragmentation of working patterns of doctors following the implementation of the European Working Time Directive (EWTD). Doctors are now limited to a maximum of 13 hours per shift in the hospital. [2] This necessitates the need for regular handovers between shifts. Consequently, robust handover mechanisms are now of the utmost importance for patient safety.[3]

The Royal College of Physicians state that "handover, particularly of temporary 'on-call' responsibility, has been identified as a point at which errors are likely to occur." [4] Mortality rates for inpatients at acute hospitals over weekends are higher than those during the week.[5] There are a number of factors that influence this including the inadequacy of weekend handover from the patient's regular team to the on-call team taking over responsibility of care at the weekend.

The Junior Doctors Committee has recommended that ideally handover be supported by information systems identifying all relevant patients.[3] This view is supported by a number of papers that have shown the positive effects electronic handover brings to the process of medical handover, including better continuity of care, improved quality, and a reduction in safety incidents.[6][7][8][9] We therefore felt it essential that we implement a suitable replacement for the inadequate ExtraMed system.

Baseline measurement

In order to confirm the issues with weekend handover and the ExtraMed system, a questionnaire was given to the doctors (Foundation Year 1, senior house officer, specialist registrar) involved in medical weekend handover. It was used to obtain their views on both the current process of weekend handover and the ExtraMed system together with any improvements or specific areas to focus on. The same group of doctors were surveyed after implementation of the new system using a modified questionnaire to assess whether they felt there had been an improvement in weekend handover and the electronic handover system. These questionnaires used yes/no, Likert scales, and free text questions.

The baseline questionnaire revealed that only 12% of doctors used the ExtraMed system to handover at the weekend. However, 100% reported using paper handover. Such a low percentage use of the electronic system was particularly worrying given the unreliable nature of paper handover that the majority of doctors were solely relying on to conduct weekend handover. Eighty-nine percent found sorting through jobs they were handed over time consuming. This was mainly the result of the use of paper handover. Poor legibility of handwriting and multiple sheets of paper to be sorted through necessitated the on-call doctor to re-write and decipher the jobs handed over. Sixty-seven percent of surveyed doctors reported being handed over jobs meant for a different grade of doctor. This resulted in issues such as patients being reviewed by a doctor with insufficient experience to make a safe clinical assessment. Only 41% were aware who weekend discharges should be handed over to.

Due to the constantly increasing bed pressures in the hospital and consequent importance of timely discharges, this was noted to be

an important issue to improve upon. Mean subjective assessment of the safety of weekend handover was 3.18 out of 5. This was assessed by asking doctors how safe they felt weekend handover was on a scale of 1 to 5, with 1 being very safe and 5 not safe at all. The free text section of the questionnaires revealed that the main deficiencies of the ExtraMed system were its time consuming and complicated nature. The only positive points noted were the fact the system was electronic and jobs could be added after the handover meeting if necessary.

We also asked the question, "what would you want from a handover system?" The replies mostly focused on the need for a system meeting the following criteria:

- IT based system
- Ease of use
- Ability to sort jobs by grade
- Provision of background information, eg resuscitation status, ceiling of care, relevant PMH
- Handover of appropriate jobs with specific action plans.

See supplementary file: ds4306.docx - "Baseline measurement questionnaire (pre-changes)"

Design

Changes to medical handover were designed using information from our baseline measurements whilst aiming to meet the guidelines for medical handover set out by The Royal College of Physicians. The design plan was as follows:

- Friday handover meeting to be changed to an earlier time of 4:00pm to enable easier time management of handover issues
- Meetings held in a quieter doctors' office to minimise interruptions
- Second-on SpR to chair the meeting to ensure the set order of proceedings is followed and that jobs handed over are appropriate with sufficient clinical information provided. They will also be responsible for taking a register to encourage full attendance by a representative from each medical team
- Set order of proceedings followed: handover of sick patients first followed by other ward reviews
- SBAR tool used to ensure clear, effective verbal handover
- All documentation via electronic system to avoid the previous issues paper handover presented mentioned above
- Jobs such as checking bloods or potential discharges to be reviewed by each team's SpR or consultant on the Friday ward round - these do not need to be discussed at the handover meeting

- Proforma on electronic handover system to ensure all necessary patient information available to weekend team: demographics, ceiling of care, resuscitation status, patient background, treatment plans. Also requires grade of doctor responsible for each task to be specified.

The authors had experience of a simpler, dedicated electronic handover tool in use at several London and Essex hospitals. The new tool is simple and intuitive to use, allowing for essential information such as patient demographics, ceiling of care including resuscitation decisions and background of patient to be entered. The information for each individual patient to be handed over is entered into the relevant boxes and then saved onto the system for four days before being automatically deleted. This ensures only the correct jobs for each weekend are saved onto the handover system to avoid unnecessary jobs being duplicated.

At the weekend, the on call doctor is then able to print out the list of jobs entered onto the handover system. The jobs can be filtered by which grade of doctor they have been handed over to (FY1, SHO or SpR). This allows a print out to be generated including only the relevant jobs for each grade of doctor avoiding confusion over who has completed each task.

It is a stand alone system using Microsoft Access, not integrated with the current patient administration system that has been approved by the trust's information governance committee. The system was installed on minimum two computers per ward, at least one being in the doctors office. The busier wards received the system on up to four computers to ensure ease of access to the system.

The authors gained funding from the trust for implementation of this system by use of information from questionnaires on junior doctors' views on handover together with support from the trust's IT department.

Strategy

PDSA cycle 1: Following results from initial questionnaires, funding was gained from the trust for purchase of the new electronic handover system. In order to obtain funding a business case had to be submitted to the trust, which required consultant backing and careful cost calculation. This system was installed on at least two computers per medical ward to ensure adequate accessibility and usage. The weekend medical handover meeting was changed to an earlier time of 4:00pm and to a quieter location. A register was taken at each weekend handover meeting. These changes and how to use the new electronic system were presented at each year group's formal weekend teaching. Junior doctors were also taken through the changes made to handover informally on the wards and shown how to enter information on to the handover system. A repeat questionnaire was performed to assess the impact of these changes. It revealed that 100% of doctors now used the electronic handover system. Handover was viewed as being safer than before the changes were implemented and sorting through jobs less time consuming. However, problems with attendance of the junior doctors and leading registrar at the weekend meeting were

highlighted by both questionnaires and registers. Furthermore it was noted that a significant amount of inappropriate and poorly explained jobs were being placed on the electronic system.

PDSA cycle 2: The changes made so far and the importance of full compliance with both the electronic system and attendance at weekend handover meeting were presented at the medical grand round. Medical registrars were spoken to informally on the wards to emphasise the importance of their attendance at the meeting when they were scheduled to lead it and their role in ensuring junior's on their teams were engaging with the process of weekend handover. This aimed to increase awareness among the more senior doctors of the problems with medical weekend handover and of the role they could play in aiding junior doctor compliance with the changes. The medical director sent an email around to all doctors to emphasise the importance of medical handover and of the need for 100% compliance with the changes. Attendance was measured both via the register at each meeting and verbal feedback from doctors involved in handover. This revealed that junior doctor attendance had improved however registrar attendance remained an issue. The number of inappropriate jobs was reported to remain an issue.

PDSA cycle 3: The changes made were presented at the trust monthly audit meeting. This was attended by all grades of doctor from FY1 to consultant. Remaining issues with registrar attendance and inappropriate jobs were focused on. Consultants and registrars were encouraged to focus on handover during their Friday ward round to ensure appropriate plans for patients were communicated to their juniors. Support for rota facilitation to enable registrars to attend the handover meeting on Friday was gained.

Results

Following introduction of the new handover meeting structure and electronic handover system the junior doctors were surveyed again with a modified questionnaire. A three-month introductory period was afforded to the new arrangements to ensure sufficient time for integration of the system into everyday practice. The questionnaires demonstrated that both the electronic handover system and new structure of weekend handover were a success.

Results from the follow up questionnaire:

- 100% of doctors reported using the electronic handover system compared with only 12% who had used the ExtraMed system. Following introduction of the new handover meeting structure and electronic handover system the junior doctors were surveyed again with a modified questionnaire. A two-month introductory period was afforded to the new arrangements to ensure sufficient time for integration of the system into everyday practice. The questionnaires demonstrated that both the electronic handover system and new structure of weekend handover were a success.

Results from the follow up questionnaire:

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- Subjective assessment of safety improved from 3.18 / 5 to 3.84 / 5
- Only 47% reported sorting through weekend jobs to be time consuming compared with 89% before the changes were implemented
- Handover of patients suitable for consideration of weekend discharge improved, with 89% of doctors now aware who to hand weekend discharges to compared with only 41% before
- Before 67% got jobs handed over to them for a different grade which improved to 37%
- Free text sections revealed:
 - Main advantages of electronic system: clear escalation plan / ceiling of care for patients, ease of use, legible, organised, can not lose jobs
 - Main disadvantages of electronic system: not available on all trust computers, no option for bank holiday handovers.

Results from informal interviews on the wards:

- The new time and more structured nature of the weekend handover meeting was felt to have resulted in a marked reduction in inappropriate or poorly explained jobs being handed over
- However, jobs such as checking blood tests or scans that were put on the electronic handover system without being discussed at the meeting were noted often to be inadequately explained or inappropriate
- The other main problem noted was that if the SpR leading the meeting was late due to other commitments the meeting was delayed and the structure would fall apart
- All doctors interviewed felt the changes had resulted in a positive effect on both patient safety and effectiveness of weekend handover.

See supplementary file: ds4805.docx - "Table to show results of changes made to medical handover at Broomfield Hospital as measured by questionnaires."

Lessons and limitations

From our repeat questionnaire and observation of the handover process we have noted a number of deficiencies that still need to be addressed:

1. There needs to be greater focus on the weekend handover by each medical team on Friday. This requires the consultant or SpR leading the Friday ward round to ensure weekend plans are made for each patient and the junior doctor responsible for handing over is aware of and understands these plans. This should include decisions such as resuscitation status, ceiling of care, need for a

review or bloods over the weekend. Continued involvement of a consultant and registrar in this project is therefore essential to enable engagement and education of more senior doctors.

2. We are aiming to add in a tool to the electronic system to enable each patient's team on the Monday to check that jobs they handed over for the weekend have been completed. This aims to complete the handover loop and further improve patient safety and quality of care.
3. Adjustments are required to the weekend handover meeting. Most importantly we are in discussion with the rota co-ordinators with regards to rota facilitation to enable the SpR and SHO to attend without on-call duties on the Friday afternoon. Ideally we are aiming for a consultant led meeting to both improve attendance and emphasise the high level of importance placed on the process of handover by the trust.
4. More formal training is necessary to educate both junior doctors and consultants on what jobs are appropriate to be handed over solely on the electronic handover system and those that require an additional verbal handover.

The handover database has been used successfully in many hospitals so far, showing that the system is sustainable even through the process of when doctor's change over. As with any handover system at Broomfield, all doctors will be trained on using the system at their induction. We understand it can be a lot of information to take in when learning a new system, and will produce easy to read handouts that talk the user through the electronic handover process. These can be included in the trusts induction pack. In addition, we will continue to regularly re-audit our handover system at Broomfield Hospital and obtain user feedback to improve the system.

Conclusion

The study has demonstrated that the new electronic handover system combined with the daily and weekend handover meetings, has improved the quality of medical handover at MEHT. Specifically the engagement in handover processes from junior doctors has significantly improved, and the collated opinions from doctors have been that handover and therefore patient safety, has significantly improved. Additionally the changes have contributed to timely discharges by identification of appropriate patients for the discharge team to review at the weekend.

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Declaration of interests

Nothing to declare.

Acknowledgements

Dr Rakesh Shah (consultant), Dr Chandni Patel (joint first author).