

## Traffic lights: putting a stop to unsafe patient transfers

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### Abstract

Poor handover between doctors is a recognised cause of error in hospitals.[1] Watford General Hospital is a busy acute trust in southern England, where high admission rates necessitate timely patient transfers from the acute admissions unit (AAU) to the medical wards. We found that doctors were infrequently informed of patient transfers, and they rarely handed over patient care when a patient was moved. Our aim was to minimise preventable harm to patients by prompting handover of clinically unstable patients, and patients with outstanding investigations or referrals, at the time of transfer. We introduced a traffic light tool to categorise patients on the medical take as red, amber, or green according to their clinical status at time of admission to AAU. The traffic light colour, which was assigned both on paper and electronically, was designed to prompt a verbal handover between doctors at the time of patient transfer from AAU.

### Problem

At Watford General Hospital, each junior doctor on-call for medicine clerks new patients in accident and emergency while simultaneously overseeing a bay of fifteen patients on the acute admissions unit (AAU). During a shift, several of the patients on AAU will be transferred to the medical wards due to pressure to make beds available for new admissions.

We observed that AAU patients were frequently transferred without informing the junior doctor overseeing their care. Worryingly, patient transfers often happened during nights and weekends when staffing is reduced. Moreover, there was no practice of handing patients over to doctors on the medical wards, jeopardising patient safety and continuity of care.

Our first aim was to anticipate the potential need to transfer all patients admitted to AAU. By prompting a senior clinician to categorise patients according to their clinical stability and whether there were outstanding investigations or referrals, we aimed to prompt a timely and detailed handover at the time of transfer from AAU. We wanted this clinical information to be shared between doctors, nurses, and bed managers so that it could be considered when planning patient transfers.

Secondly, we aimed to ensure only stable patients would be transferred from AAU to the wards, with those too unstable for transfer remaining on AAU until their condition was stabilised or their care was escalated to the appropriate setting.

Overall, we hoped to improve patient safety and avoid delays in patient care. We anticipated that prioritising both safety and continuity of care would ultimately facilitate earlier discharges and reduce hospital costs.

### Background

Attendances to accident and emergency departments in the UK

have risen dramatically in the last decade. There was almost a 50 per cent increase in attendances between 2003 and 2013, and accident and emergency departments dealt with 21.7 million patients last year.[2] 5.3 million of these patients were admitted to hospital as acute admissions. However, the number of acute hospital beds available is falling.[3] This creates pressure to increase patient flow through the hospital, with patients transferred between clinical areas in order to create space for new admissions.

A study of errors made by junior doctors found that patients were 3.5 times more likely to have been looked after by a junior doctor from another team than the patient's own at the time of an adverse event. The authors speculated that this higher rate of adverse events was likely due to the junior doctors' lack of familiarity with the patient.[4] Current handover practice when a patient is transferred within a hospital varies widely in its timing, form, content, and quality. Both the Royal College of Physicians and the Royal College of Surgeons have introduced tools in an attempt to improve and standardise handover.[5,6]

### Baseline measurement

We surveyed AAU doctors, finding that they felt they were informed of less than fifteen per cent of patient transfers (figure 1). Eighty percent of doctors felt a patient under their care had been transferred unsafely without their knowledge.

We asked junior doctors to rate on a scale of 0-100% how safe they felt transfers of patients were from the AAU to the medical wards, which produced an average of 26% safe (figure 1). On a similar scale, we found that on average, junior doctors felt they were informed of patient transfers 14% of the time (figure 1). AAU doctors almost never handed over a patient who had been transferred. Overall, the safety of patient transfer from AAU was rated poorly and junior doctors shared examples of these, such as unstable patients needing discussion with specialist teams, and a patient needing admission to ITU from the ward after being transferred from AAU without a handover.

See supplementary file: ds4303.docx - "fig 1 traffic light"

PDSA cycle 2 - July 2013

## Design

We approached junior doctors, consultants, nurses, matrons, and bed managers for their collaboration in designing a tool to categorise patients on admission to AAU according to their clinical stability, and whether there were investigations or referrals outstanding. Using this approach, we introduced a "traffic light" classification, with red, amber, and green categories (figure 2).

The colour categories were incorporated into a "traffic light tool", which was in paper form, attached to the front of each patient's clerking booklet. It was to be completed on the post-take ward round, when the on-call consultant would assign a red, amber, or green colour category to the patient (figure 3). Later, if a bed was allocated on a medical ward and the patient was to be transferred, the nurse in the AAU bay was to inform the relevant junior doctor, prompting them to handover the patient's care to a doctor on the medical ward.

## Strategy

PDSA cycle 1 - March 2013

We stapled the traffic light tools to all clerking booklets in AAU by hand. We then detailed the aims of the traffic light tool to a medical consultant in advance of their weekend on-call, explaining we would retrospectively audit its use. We also alerted junior doctors and nurses to the tool, answering any questions raised.

We then retrospectively audited the use of the traffic light tool. During this forty-eight hour period, 105 patients were admitted to AAU. Of these, 44 medical patients were included in the audit. Fifty-seven percent of these (25 patients) had a traffic light tool attached to their notes, of which fifty-six percent (14 patients) had been completed by the on-call consultant on the post-take ward round (figure 4).

Overall only 32% of medical patients included in the audit had a completed traffic light tool. Patients identified in the audit who did not have a completed traffic light tool included a patient with a non-ST elevation myocardial infarction and another with a suspected pulmonary embolism.

This audit cycle showed that the tool was not being used consistently. During analysis of the audit results, we discovered that the AAU clerking booklets to which we had stapled traffic light tools had been replaced during the weekend by booklets without the tool attached.

We liaised with nursing and bed management staff on AAU to ensure that the traffic light tool would be attached to all booklets from this point forward. We also presented our results from audit cycle 1 to medical staff at a grand round, gaining support for the project from the chief executive of the Trust.

We repeated the audit over a further 48 hour period in July 2013, during which 121 patients were admitted to AAU. Of these, 38 medical patients were included. Sixty-three percent of these (24 patients) had a traffic light tool attached to their notes, of which 67% (16 patients) had been completed on the post-take ward round.

Overall, 42% of medical patients included in the audit had a completed traffic light tool (figure 5). While this was a small improvement compared to the audit cycle 1, there were still clerking booklets on AAU that did not have a traffic light tools attached, and use of the tool had not improved significantly, despite its endorsement from the Trust's chief executive and on-going education of AAU staff.

Further work

Throughout the project, we repeatedly consulted with doctors, nurses, and bed managers on AAU to obtain suggestions for improving the traffic light tool. As a direct result of their feedback, we tackled other aspects of practice on AAU acting as obstacles to safer patient transfers.

Modifications included incorporating each patient's traffic light colour next to their name on the AAU whiteboard, which is located in the central hub of AAU from which all four bays are entered. This means that the clinical status of each patient is visible centrally in AAU and therefore more accessible to bed managers. This was achieved simply by shading a red, amber, or green coloured dot next to each patient's name and bed number on the whiteboard.

We also gained the generous support of the AAU matron to purchase a designated bleep for each of the four AAU bays, allowing nursing staff to contact the doctor overseeing their bay more quickly prior to a patient transfer. In addition, we designed a portable, pocket-sized bleep directory card, providing all hospital staff with useful bleep and ward extension numbers to facilitate verbal handover (figure 6).

Lastly, we broadened our efforts to educate hospital staff about the aims and use of the traffic light tool: we gave a talk outlining the purpose of the tool at the new Foundation Year 1 doctors' induction at Watford General Hospital in July 2013. We wrote an introduction to safe patient transfers, including use of the traffic light tool in AAU, in the existing medical handbook (figure 7). This handbook is now supplied to all new doctors starting at Watford General Hospital along with the new bleep directory.

## Results

We presented the data from the two audit cycles at the acute medicine divisional clinical governance meeting in July 2013, attended by consultants, senior nurses, and managers. We received mixed feedback from senior staff, and we heard their concerns that a patient's stability often changes during their admission, leading to some consultants' reluctance to allocate a red, amber, or green colour category on the post-take ward round.

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Evidently, support for the traffic light tool from senior staff members was mixed, despite strong feelings from junior doctors that such a tool was necessary.

We also learned of plans to develop electronic patient-tracking software that was to be introduced into the trust in the near future. It was felt by some senior staff that this software negated the need for the traffic light tool, as junior doctors on AAU would be able to look up electronically the new location of patients transferred from AAU during their shift. We used this opportunity to explain that this did not necessarily improve patient safety or continuity of care, as it would not prevent the transfer of unstable patients without a doctor's knowledge, nor did it prompt a handover of outstanding investigations or referrals. We subsequently approached the lead designers of the new software programme, to ensure each patient's traffic light colour status would be incorporated as an additional information field. This allowed staff on medical wards to access information about a patient's clinical stability remotely from AAU prior to transfer.

At this meeting, we explained we would soon be leaving the Trust, and sought for help in continuing this project after we had left. Our request was met with reluctance from AAU consultants to champion the tool.

Measuring the outcome of our many interventions was difficult. After leaving the trust, we asked a member of staff from the education centre to help us to repeat the questionnaire we did at the beginning of the project. Unfortunately, we only received eight responses from junior doctors (figure 8). We asked that the doctors instinctively mark their answers on a line representing 100%, and found they rated the safety of patient transfers as on average 52% safe (from a previous 26% safe). They felt they were informed on average 15% of the time when a patient under their care is about to be transferred (previously 14%). Fifty percent of the responders thought a patient had been transferred unsafely from AAU while working there (previously, 80% felt this way). These numbers are of course less significant given the low rate of response. Additionally, by this time the new patient online system for tracking patient locations was in use throughout the hospital. Two of the eight responders felt the red/amber/green traffic light rating on this system was helpful to safe handover, whereas three found it unhelpful and three doctors were not aware you could use the traffic light tool on this software. We also heard of unwell patients not being handed over following transfer from AAU despite the implementation of this new software, again leading to unnecessary deterioration and delays.

See supplementary file: ds4304.docx - "Figures 2-8 traffic light"

### Lessons and limitations

Even with strong support from junior doctors who felt that handover procedure was poor and wanted to improve the safety of patient transfers from AAU, adoption of the traffic light tool was slow.

Overall, our challenges were predictable: we found widespread agreement among junior doctors that patient safety at the time of

transfers needed improvement, but support for the traffic light tool itself was mixed. This was despite our efforts to consult with doctors, nurses, and bed management staff on AAU during its design and development. We acknowledge that we were not able to reach all AAU staff members during the initial design phase, and that our colleagues may have supported the concept of a traffic light tool, but not the requirement to complete an additional form for each patient admitted to AAU. In addition, it was not possible to audit whether handover between doctors had occurred at the time of patient transfer from AAU to the medical ward, only whether patients had a completed traffic light tool prior to transfer. We also could not assess quantitatively whether use of the tool had improved quality of care or reduced hospital costs.

Furthermore, the authors led this project whilst rotating through various departments, with both authors away from Watford General Hospital for four months of the year during GP placements. During this time, we maintained momentum with the project via email and occasional visits to the AAU after work and teaching sessions. This project took place during our Foundation Year 2 at Watford General Hospital, and it was a challenge to implement a large shift in handover culture among doctors, nurses, and bed managers in that time, which we could ensure would be sustained after we left.

We found our greatest success by allowing the project to expand in new directions, improving the safety of handover practice in as many ways as possible. This meant that the project not only produced the traffic light tool, but also a new set of AAU bleeps, a hospital bleep directory and an additional design feature of the new patient tracking software.

### Conclusion

Despite stretched resources within NHS acute trusts, Robert Francis QC emphasised that it is vital to "foster a common culture shared by all in the service of putting the patient first" following the tragedies that occurred in Mid Staffordshire.[7] We suggest that adverse events can be minimised by a culture in which patient transfers are anticipated and handover between teams is routine. We engaged a wide range of multidisciplinary staff in a busy acute trust, to develop a tool to improve safety of intra-hospital patient transfers. Establishing such a momentous culture shift was challenging, requiring modifications and further work to support positive change. However, we feel that our tool could be developed for use for all intra-hospital transfers at Watford General Hospital, and could be more widely used in acute hospital trusts under similar pressures to increase patient flow, reducing the clinical risks associated with patient transfer.

### References

1. New RCP toolkit launched to avoid handover errors. 2011 July 6 Available from: <http://www.rcplondon.ac.uk/press-releases/new-rcp-toolkit-launched-avoid-handover-errors>
2. Are Accident and Emergency attendances increasing? The King's Fund, 29 April 2013 Available from:

<http://www.kingsfund.org.uk/blog/2013/04/are-accident-and-emergency-attendances-increasing>

1. Emergency admission to hospital: managing the demand. report by the National Audit Office, 31 October 2013  
Available from:

<http://www.nao.org.uk/wp-content/uploads/2013/10/10288-001-Emergency-admissions.pdf>

1. Petersen LA, Brennan TA, O'Neil AC, Cook EF, Lee TH. Does housestaff discontinuity of care increase the risk for preventable adverse events? *Ann Intern Med* 1994;121:866-72.
2. Acute Care Toolkit 1: handover. Royal College of Physicians, 1 May 2011 Available from:

<https://www.rcplondon.ac.uk/sites/default/files/acute-care-toolkit-1-handover.pdf>

1. Safe Handover: Guidance from the Working Time Directive working party. Royal College of Surgeons, March 2007  
Available from:

<http://www.rcseng.ac.uk/publications/docs/publication.2007-05-14.3777986999/>

1. Mid Staffordshire NHS Foundation Trust Public Enquiry - Executive Report, Robert Francis QC, 6 February 2013.  
<http://www.midstaffpublicinquiry.com/report>

## Declaration of interests

None.

## Acknowledgements

Dr. Chantal Kong, Dr. Becky Hodgkinson, Dr. Phillip Campbell, Dr. Mike Van Der Watt, Samantha Jones, Angela White, Mary Richardson, and Dr. Alistair King.