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Eyes on Evidence
expert commentary on important new evidence

Effects of a patient handover intervention on rates of medical errors and preventable adverse events

A prospective intervention study in 2 hospital paediatric units in the USA finds that a bundle of measures to improve handover of patients between junior doctors reduces the rates of medical errors and preventable adverse events.

Overview: More than 70% of patient safety incidents occur in acute or general hospitals (National Reporting and Learning System 2014). From October 2012 to September 2013, more than a million patient incidents were reported in this setting in England and Wales. The largest category was 'patient accident', accounting for almost a quarter of the incident reports. Incidents relating to 'access, admission, transfer, and discharge (including missing patient)' and 'documentation (including records, identification)' together accounted for 15% of incident reports.

Poor handover between doctors, nurses and multidisciplinary teams is a common cause of error in hospitals and a major preventable cause of patient incidents. Strategies to improve handovers include communication training (Leonard et al. 2004), mnemonics to standardise handovers (Riesenberg et al. 2009), and written or computerised tools (Li et al. 2013).

Current advice: The Department of Health has produced a list of 'never events', which are serious, largely preventable patient safety incidents that should not occur if the available preventative measures have been implemented by healthcare providers (Department of Health 2012). The list comprises 25 'never events' covering aspects of care from administrative procedures, such as misidentification of patients, to surgical errors, including incorrect site or wrong implant used.

In 2010 the National Patient Safety Agency (now part of NHS England) produced 'Medical error' – a guide for junior doctors on what to do if medical errors occur. It noted that 'medical errors are rarely caused by bad individuals, but are more often caused by bad systems'.

New evidence: Starmer et al. (2013) reported on an intervention to improve patient handover between junior doctors in 2 hospital paediatric units in the USA. Pre-intervention data were collected for 3 months (July to September 2009; n=642 admissions) before the intervention was introduced in October 2009. Post-intervention data were then collected for 3 months (November 2009 to January 2010; n=613 admissions). The 84 participating junior doctors were in their first or third year after graduation (interns or residents) and received incentives such as cookies or gift cards.

In the pre-intervention period, verbal handovers were mainly made by intern to intern and by resident to resident. No team-based approach, standardised structure or dedicated location for handovers were used. A printed document with the patient's information and a 'to-do list' was exchanged during handovers, but this document was not integrated with the patient's electronic medical record.

The intervention included a 2-hour training session to introduce the programme and discuss best practice for verbal and written handovers. Verbal handovers were standardised with a mnemonic,

conducted in a team with interns and residents present, and were overseen at least once a month by a senior doctor. In 1 of the paediatric units a computerised handover tool linked to electronic medical records was also used; the other unit continued to use the printed document.

Overall medical errors reduced from 33.8 per 100 admissions (95% confidence interval [CI] 27.3 to 40.3) pre-intervention to 18.5 per 100 admissions (95% CI 14.7 to 21.9, p<0.001) after the intervention. This overall score included reductions in preventable adverse events (from 3.3 to 1.5 per 100 admissions, p=0.04), medical errors that had the potential to cause injury but failed to do so ('near misses'; from 7.3 to 3.3 per 100 admissions, p=0.002), errors that had the potential to cause injury but did not reach the patient (from 15.0 to 8.3 per 100 admissions, p<0.001), and errors with little or no potential for harm (from 8.3 to 5.2 per 100 admissions, p=0.04). Non-preventable adverse events did not change significantly (from 1.7 to 1.6 per 100, p=0.91). Drug errors accounted for 77% of all reported errors and adverse events.

After the intervention, doctors spent slightly more time with patients and families. The intervention did not increase the amount of time spent at the computer, on verbal handovers, or on preparing the handover document. The post-intervention handovers were also more likely to occur in a private and quiet location.

The intervention consisted of several evidence-based components that were bundled together, so assessing which part was the most important or whether all components were needed was not possible. The authors noted the possibility of confounding because pre-intervention data were collected in summer and the post-intervention data collection was in winter. The doctors would have gained experience over this time, and patients' characteristics could have differed. Additional limitations were associated with the study design: the observational nature meant the study could not determine causality, the lack of blinding could have introduced bias, and the results may not be generalisable outside the paediatric inpatient setting.

Commentary: "This is a good intervention study addressing an important problem. Altered working hours, shift work and increased sub-specialisation have grown in medical settings throughout the world. The problems of ensuring safe handover of information and patient plans between teams are well known. Starmer et al. (2013) have clearly demonstrated the positive benefits achieved by creating bundles of evidence-based techniques to smooth handover. Fewer errors, more time with patients and better documentation: what's not to like?

"The authors recognise the limitations of the study and call for larger scale trials. Although this recommendation is scientifically pure, this work, coming as it does on the back of other continuous improvement work related to handovers (for example, Catchpole et al. 2007), argues in favour of early adoption of evidence-based bundles across health systems in addition to further study. The adoption of bundles of care has been successful in many areas of patient safety (for example, line infections and pressure ulcers), and even a small reduction in error is worth having if you are a patient. There seems to be little downside to implementation, and certainly little risk.

"Starmer et al. (2013) and several other groups around the world will clearly continue to work on which components of the bundles are most important or perhaps superfluous, and there will undoubtedly be advances associated with both automation and developments in electronic patient records. UK groups will need to look at these bundles and, if necessary, adapt them for UK working conditions. But their introduction would be a simple and practical advance in care." ***– Professor Martin Elliott, Professor of Cardiothoracic Surgery at UCL, Professor of Physic at Gresham College, London and co-Medical Director at The Great Ormond Street Hospital for Children NHS Foundation Trust***

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