Reducing avoidable dose omissions: A quality improvement initiative using time series analysis to assess the impact of a complex intervention
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Context
The improvement work was conducted across a large acute tertiary care hospital, and involved doctors, pharmacists and nurses. The work has been ongoing since 2010, and was incorporated into the Trust’s top ten objectives to improve patient safety by reducing medication errors, specifically avoidable dose omissions, in 2012.

Problem
Medication omissions at prescribing, dispensing or administration stages have been identified as a potential for patient harm. Strategies such as medicines reconciliation have used to reduce the risk of prescribing omissions. However, omissions at the dispensing or administration stages may persist, leading to suboptimal treatment and adverse patient outcomes.

Assessment of problem and analysis of its causes
The problem was identified through routine voluntary incident reporting at our organisation. Nearly a third of all medication related incidents involved dose omissions, which was the most commonly reported category. Preliminary root cause analysis and audits indicated multiple causes and contributory factors at all stages of the medicines use process. The highest number of omissions were reported at the administration stage, usually due to: patient refusal, unavailability of medicines or valid clinical reasons. Audits showed 8.9% overall dose omission rate, including a proportion of doses with no indication of whether or not the patient had received the dose. These were considered “apparent” omissions.

The findings were shared with the multidisciplinary medication safety committee, which had representation from senior and junior grades of doctors, nurses and pharmacists.

Engaging staff
Results were disseminated from the committee to relevant divisions and wards. Absolute rate of avoidable dose omissions was 2.5%. Matrons for each area were responsible for identifying local contributory factors and agreeing action plans to involve all staff groups.

Strategy for change & Intervention
One of the key requirements to implement changes was the need for regular, timely data about the problem to inform and engage staff at the ward level. Details of the intervention are outlined in figure 1.

Measurement of improvement
Effects of changes were measured through monthly audits of dose omissions. Ten drug charts per ward were selected systematically (1 in 5 or 1 in 3 depending on ward size) and audited. Data was reported via Trust scorecards.

A target of <1.25% avoidable dose omissions (from a baseline of 2.5%) was set. At the end of the first year, the average avoidable dose omission rate was 2.3%, with some areas achieving the target of 1.25%.

Effects of changes
Reducing dose omissions has a high priority in the organisation, with all staff groups fully aware and engaged in strategies to achieve the target. The greater awareness has led to continued reporting via the Trust voluntary reporting system. Monthly audits show a trend towards improvement, but the target is still to be met (see figure 2).

The main problem has been in the complexity and diversity of causes and contributory factors identified through local link nurses, and therefore the ‘solution’. One strategy is unlikely to suit all areas, and we are collating various approaches that have led to improvement in the different divisions to develop a toolkit for reducing omissions.

Lessons learnt
The key lesson from this work has been the importance for real time/on time data on a regular basis to engage and empower local champions to lead for improvement. In future when tackling a similar issue, we will start working with local champions rather than offering ‘the solution’ with a top-down approach.

Message for others
Understanding of the problem at local level can help develop tailored solutions for effective improvement.

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