Halving the number of missed medication doses by focusing on ‘what isn’t being done’ as much as what is

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<th>Trust name</th>
<th>University Hospitals Birmingham NHS Foundation Trust</th>
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<tr>
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<td>CQC rating (Overall)</td>
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The challenge

University Hospitals Birmingham NHS Foundation Trust is a large teaching hospital with a reputation for the quality of its care, health informatics, information technology, clinical training and research. The trust provides direct clinical services to over 900,000 patients every year, serving a regional, national and international population. It has used electronic prescribing since 2002.

In 2008 the trust identified that 16% of prescribed non-antibiotics and 10% of prescribed antibiotics were not being administered to patients. Reducing the number of missed doses became a quality priority for the organisation, and it shifted focus towards ‘errors of omission’ (what wasn’t being done) as much as errors of commission.

The solution

The trust set up an email alert system to keep service managers informed of the rate of non-administration of prescribed medicines in their clinical area. If figures continued to deteriorate, emails were sent progressively higher in the chain of command, in one extreme case reaching the chief executive. This ensured that the issue was taken seriously at all levels of management and staff were appropriately challenged.

It then rolled out clinical dashboards for all wards across the trust, which among other things provided real-time information about the rate of omission of medicines administration. The clinical dashboard allows the ward sister or charge nurse to identify outlying staff members, patients and appropriate medications, prompting appropriate discussions and actions at a local level, including medication review and review of clinical practice.
In 2009 the trust introduced meetings on root cause analysis (RCA) investigations for omission of medicines administration. They were chaired by the chief executive and attended by all executive directors, relevant clinical leads, and the divisional management teams. At these, the various reasons for non-administration, from inappropriate prescribing to inadequate stock levels (for example, unusual inhalers, nutritional supplements) or patient refusals, were discussed and appropriate solutions jointly agreed.

Solutions included:

- encouraging clinicians to review and discuss with patients the need for a regular medication (for example analgesia, laxatives)
- ensuring administration equipment (such as automated pumps) were easily available
- notifying pharmacy about recurrent stock issues (antibiotics and complex medications) and ensuring these were promptly addressed.

These proved highly effective in reducing the percentage of prescribed medication not administered.

One of the common reasons for drug non administration was patients being off the ward. To address this, the trust launched a communications campaign, via the patient portal myhealth@QEHB. They also developed mystay@QEHB, the public version of the clinical dashboard and introduced myday@QEHB. myday@QEHB identifies the daily ward schedule including timing of drug rounds, ward rounds and visiting schedules, and prompts patients to talk to their nurse before leaving the ward, in case they are due any medication during their absence, or to their doctor, if they feel a medicine is no longer necessary. At the moment this is given to patients on paper, but the team is looking into making it available electronically.

**Enablers and challenges**

Throughout the improvement journey, the trust faced significant challenges.

First, being challenged for omitting medicines was a cultural shock for staff. Across the NHS, omitting a medication is often deemed acceptable and does not always trigger discussion about appropriateness of the medication or reasons for omission. Over time, however, culture in the trust changed and staff now take medication omission as a trigger for appropriate discussion and intervention, in partnership with the patient, medical and nursing staff, as well as pharmacy services.

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1 myhealth patient-specific information: patients have their own log-in details and can view their own letters, test results, and so on. They can log-in from home any time, available in some specialties to those patients who expressed an interest.

2 mystay – specialty-level data on five groups of key indicators (one of which is missed dose rates). It is published on our public website that anyone can view, no log-in or special access required.
Second, following the introduction of the above interventions, nursing staff occasionally found themselves ‘tidying up’ the drug chart from the night before. They might, for example, administer a medication with delay and be inappropriately flagged as poorly compliant. However, this also encouraged staff to talk to the previous shift colleagues to ensure it wasn’t a regular occurrence.

Third, the lack of internationally agreed standards on what rate of medicines omission is deemed ‘acceptable’ in healthcare, as well as the inability to benchmark against other trusts in the NHS, made it difficult to identify a level of omission that would be acceptable.

Fourth, the frequent rotations of junior doctors who are the majority of prescribers was a challenge, as often their previous specialty or clinical setting determines their prescribing practices. This was addressed with targeted support where necessary.

Fifth, as with any intervention, potential unintended consequences needed to be considered and appropriately mitigated. In this case, there might be a risk that due to concerns about being singled out, ward staff might administer a medication when it might have been safer to omit one or two doses, or choose an inappropriate formulation (for example, rapid release vs sustained release), if the appropriate one was not available. This was mitigated through appropriate education, monitoring and learning from any incidents.

Although these challenges are highlighted the trust never set a 100% administration rate and through the chief executive-led RCA meetings emphasised that the process was about patient safety and quality of care. The RCA meeting also provided a forum for staff to discuss issues with the executive team and reinforce good practice. Good practice may include the omission of a drug if the patient’s condition has changed, ensuring discussion between medical and nursing staff about the change in condition and also any requirements in changes to the patient’s medication or treatment regimes.

A comprehensive electronic solution that enables tracking when medicines are prescribed and administered, was a significant enabler. Constant data collection might not be feasible where paper prescribing is still the norm, but small-scale, time-limited audits of drug charts could still provide an insight into the proportion of prescribed medicines not being administered and perhaps help to identify outlying service areas, patient groups, individuals or medicines.

**Impact**

There was a significant drop in omission of antibiotic and other medication administration. For example, the omission of antibiotic doses dropped from 10% to 4% over the next five years.

At the same time, a decrease in the mortality rate at the trust was noted, although it could not be directly linked to this particular intervention, given other safety improvement initiatives implemented at the same time (for example, measures to increase compliance with
methicillin-resistant *Staphylococcus aureus* (MRSA) screening and appropriate isolation/decoloni­sation).

On the ward, unavailability of certain medications or pumps became a rare occurrence. This freed up time to the site team, who out of hours often used to browse through medicines cupboards, looking for medicines for newly admitted patients, which had run out of stock in the high flow areas.

**Next steps and sustainability**

Clinical staff, both nurses and doctors, are now actively engaged with the improvement process and constantly proposing further changes to the prescribing system, such as new missed-dose indicators and clinical dashboard changes.

Junior doctors are also actively engaging, particularly with recommendations to help the system guide them to ‘do the right thing’.

Medicines administration remains a trust-wide improvement priority and electronic prescribing is being rolled out in the emergency department. The trust has also developed automated alerts to ward sisters, when time-critical medication (such as analgesia), is not prescribed or administered within a set timeframe, for example, in the case of a persistently high pain score.

**Want to know more?**

Have a look at the trust resources:

- clinical dashboard ward view

For more detailed information contact Samantha Baker, Quality Development Support Manager, at Samantha.Baker@uhb.nhs.uk

**To see the other case studies in this series:** visit the NHS Improvement website at: Improving quality and safety in healthcare.