

Title of initiative: Improving and maintaining medicines reconciliation on admission

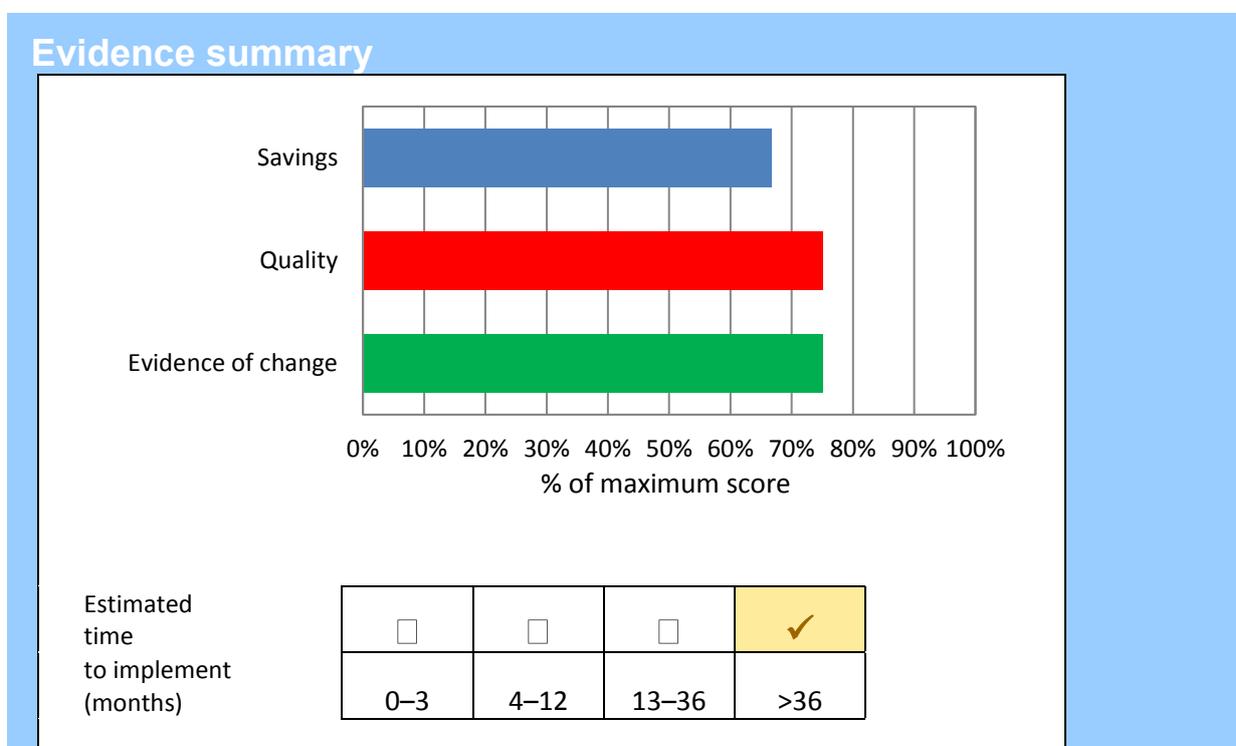
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Sharing good practice: What are 'Proven Quality and Productivity' case studies?

The NICE Quality and Productivity collection provides users with practical case studies that address the quality and productivity challenge in health and social care. All examples submitted are evaluated by NICE. This evaluation is based on the degree to which the initiative meets the Quality and Productivity criteria: savings, quality, evidence and implementability. The assessment of the degree to which this particular case study meets the criteria is represented in the summary graphic below.

Proven Quality and Productivity examples are case studies that show evidence of implementation and can demonstrate efficiency savings and improvements in quality.



Details of initiative

Purpose	To improve medicines reconciliation by ensuring that patients received medicines reconciliation within 24 hours of admission. The target was to exceed 95% of patients as recommended by the guidance published by the National Patient Safety Agency (NPSA) and NICE and the Safer Patients Initiative (SPI).
Description (including scope)	<p>North Bristol NHS Trust is a trust in South West England. It has approximately 1,000 beds, and treats about 70,000 patients annually via elective and emergency admissions. This project was designed to ensure medicines reconciliation was carried out within 24 hours of admission, to help optimise prescribing and reduce medication errors.</p> <p>This work uses the SPI improvement methodology starting with the use of the model for improvement and 'Plan, Do, Study, Act' (PDSA) cycles as well as tests of change on 1 ward. The methodology requires a sample of 5 patients per ward per week to be used. As such, it could only be undertaken on wards with a significant number of admissions each week.</p> <p>The team focussed on the wards with the greatest number of admissions (>2% of total admissions). It also set in place definitions for :</p> <ul style="list-style-type: none">• Reconciliation within 24 hours of admission. In line with the NHS definition, medicines reconciliation had to be completed no later than 5pm on the second day after admission.• Completion of medicines reconciliation: the point at which all changes to prescribed medicines had been highlighted but not necessarily acted on. Any urgent changes, which if left unchanged could result in patient harm, would be acted on immediately.
Topic	Medicines use and procurement
Other information	Medicines reconciliation is common practice in many hospital wards. Its importance has been highlighted recently in the updated NICE guidance (NG5), the Medicines Optimisation Dashboard and the Hospital Pharmacy and Medicines Optimisation Project (HoPMOp). While this case study was carried out between 2007 and 2015, it remains a good example of how to add value via medicines reconciliation to any hospitals where the practice is not currently embedded.

Savings delivered

Amount of savings delivered	Annual savings of £450,100 were achieved for a population of around 900,000 in Bristol, South Gloucestershire and North Somerset. This is equivalent to £50,000 per 100,000 population.
Type of saving	This initiative is not cash-releasing but increased productivity due to improved medicines management. Savings are assumed as a result of reduced adverse events associated with medication errors.
Any costs required to achieve the savings	No costs highlighted, but pharmacist and/or other staff time was used to undertake the medicine reconciliation exercise.
Programme budget	Various
Supporting evidence	<p>During the work to improve medicines reconciliation on admission, the Quality, Innovation, Productivity and Prevention (QIPP) programme was introduced. The QIPP Medicines and Procurement programme, included medicines optimisation, transfer of care and QIPP Benchmarking or medicines reconciliation. Additionally, the research conducted by Sheffield University to cost the impact (cost avoidance) of the medicines reconciliation process contributed to the audit.</p> <p>Previous medicines reconciliation carried out at North Bristol NHS Trust had a focus on medicines reconciliation within 24 hours of admission as a driver for patient safety. This audit sought in addition to calculate the costs avoided by pharmacist-led medicines reconciliation.</p> <p>A starting point was reviewing the work of the Karnon Report (2009). The Karnon Report, a National Institute for Health and Care Excellence (NICE)-sponsored cost effectiveness review from the University of Sheffield, used a meta-analysis tool to calculate the cost incurred by preventable drug errors, and the cost of a pharmacist employed to prevent these errors from happening. Based on the assumption that each patient admitted to hospital is prescribed 5 medicines, the average cost avoidance calculated in the report was £5.52 per patient.</p> <p>The overall aim of the audit was to localise the findings of the Karnon report to North Bristol NHS Trust, proving that the cost avoidance within the Trust through medicines reconciliation is at least £5.52 per patient.</p> <p>Patients admitted to North Bristol NHS Trust were found to bring in an average of 5.99 prescribed items each, more than the 5 set by the original standards.</p> <p>The cost avoidance from pharmacist-led medicines reconciliation, based on the pay band of the pharmacist carrying out the intervention, was found to be £13.64 per patient on average</p>

(2013). This ranged from £10.82 for Band 6 pharmacists to £18.40 for the Band 8a specialist pharmacists.

The results showed that Band 8a pharmacists were more cost effective when conducting medication reconciliation. They were completing more complex medicines reconciliations, which would have required escalation to them, had reconciliation been carried out by lower band staff. There would also be an additional benefit in utilising Band 8a pharmacists as they could assist in educating clerking prescribers who admit patients, minimising errors at the first possible opportunity.

The admission rates at the Trust range from 2,500–3,000 per month, or 30,000–36,000 per year. Using the average cost avoidance rate of £13.64 per patient, and based on an average of 33,000 admissions per year, the authors estimate a cost avoidance of £450,000 as a result of the medical reconciliation initiative.

Quality outcomes delivered

Impact on quality of care or population health

The quality of care provided to patients is expected to improve due to the processes and timelines set out, ensuring that medicine reconciliation is carried out within 24 hours of admission. This process could potentially improve the quality of care provided to patients by ensuring that they are using the correct medication.

Impact on patients, people who use services and/or population safety

The system encourages the re-use of patient's own drugs (PODs) brought into hospital on admission, if appropriate. The benefit of this, in addition to saving money, is that patients can be kept on the same type and brand of medicine they are familiar with, reducing potential errors or accidental duplication of treatment. Patients experience better care because the intervention could reduce the risk of harm from adverse drug interactions as well as the risk of other negative consequences, such as increased frequency or duration of hospitalisation.

Impact on patients, people who use services, carers, public and/or population experience

The experience of patients and carers should be positive because decreased length of stay in hospital would reduce the time that carers need to visit the hospital. The impact on the public is increased capacity for patients in need of care as the intervention has the potential to free up beds.

Supporting evidence

The authors attached information on reduced length of stay (LOS) from 2007 to 2012, which reduced from 5.8 days to 5.2 days.

Improved patient satisfaction has also been documented, because patients have opportunities to discuss their medicine-related concerns during the medicines reconciliation process.

Evidence of effectiveness

Evidence base for case study

The initiative was based on recommendation 1.3.1 in NICE's patient safety guide (PSG1) on technical patient safety solutions for medicines reconciliation on admission of adults to hospital (Updated as NICE's guideline on [medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes](#))

The impact of medication errors on patient safety has been referenced in this submission^{2,3}. The submission also states that although there is difficulty in showing measures of the outcome benefits of medicines reconciliation, it is generally accepted that medication reconciliation is beneficial.

Evidence of deliverables from implementation

The initiative was implemented Trust-wide with 30 wards participating by March 2014. The organisation used an electronic data collection tool to capture progress of the initiative against the target of achieving and maintaining medicines reconciliation for 95% of patients.

Where implemented

North Bristol NHS Trust

Degree to which the actual benefits matched assumptions

The initiative has met expectations for improving and maintaining medicines reconciliation. It has been maintained despite the opening of a new hospital in May 2014 resulting from a merger.

If initiative has been replicated how frequently/widely has it been replicated

Progress has also been made by other trusts attempting to replicate this work, although they have not yet achieved the same levels of success. This could be due to the length of time it takes for such initiatives to be embedded and the number of wards the initiative has been implemented in.

Supporting evidence

A run chart showing progress in improving and maintaining the medicines reconciliation initiative from initial implementation until November 2015 was provided with the submission. A QIPP run chart showing the percentage medicines reconciliation achieved by North Bristol NHS Trust and other trusts from January 2010 to January 2015 was also provided to show how effectively the cross-organisational knowledge transfer had progressed.

Details of implementation

Implementation details

The Bristol initiative began in 2007 when the Trust was selected to take part initially in the SPI followed by the Southwest Quality and Patient Safety Improvement Programme (SWQPSI). Both of these programmes had a target of improving medicines reconciliation.

The project team started by creating a medicines admission proforma and an e-audit tool for data collection in the wards. The proforma captured data about medicines used by the patient on admission. Data collected from 1 ward was used for baseline assessment. Phases 1 and 2 were carried out under the SPI initiative and phases 3 to 5 were under the SWQPSI programme.

In phase 1 (February 2007 to July 2008), medicines reconciliation was carried out in 8 wards. The process required the clerking doctor to perform the initial medicines reconciliation by completing the proforma. Pharmacists then performed the second-line reconciliation. Information leaflets and training were provided to ensure that all employees were aware of the initiative.

By phase 2 of the project (August 2008 to July 2009), medicines reconciliation operated on 11 wards. A DVD was developed for purchase to provide training on medicines reconciliation for medical students and doctors. The project team improved communication with patients, ambulance staff and GPs. It also began to produce run charts detailing progress against the overall target of 95% reconciliation using randomised data.

Phase 3 occurred between August 2009 and February 2011, bringing to 30 the number of wards on which routine medicines reconciliation was provided. Establishing additional pharmacist posts enabled the service to spread more quickly and to higher risk areas. An evaluation of the accuracy of medicines reconciliation was undertaken and the service eventually spread to 42 wards. By the end of this phase, the project achieved the target of delivering 95% of medicines reconciliation in 30 wards within 24 hours of admission, as show in figure 1.

Quality and Productivity

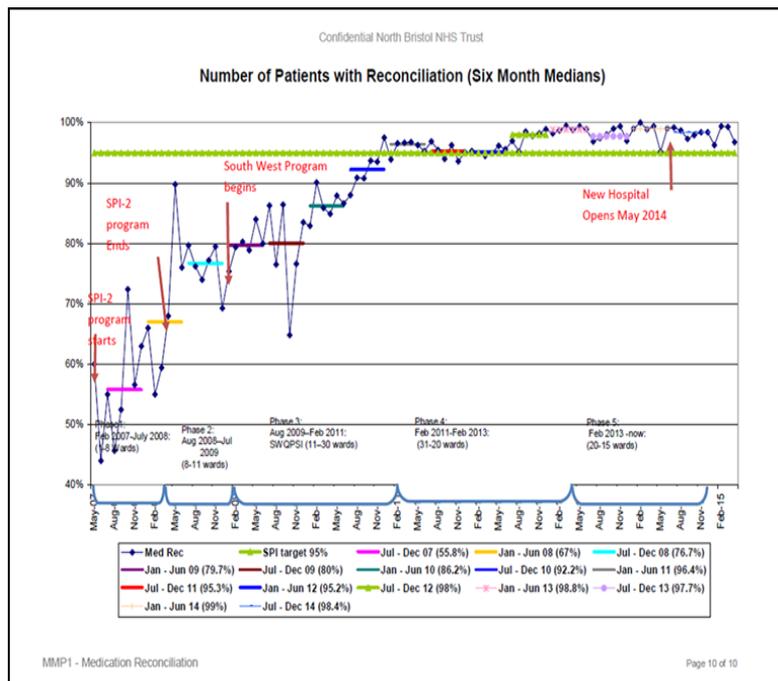


Figure 1: Run Chart: Numbers of Patients with Medicines Reconciliation: 2007-2015

The goal in phase 4 (February 2011 to February 2013) was to maintain and improved medicines reconciliation across the Trust. Ward reconfigurations took place during this period, reducing the total number of wards participating in this process to 20. Daily admissions were reanalysed, including Sunday admissions, to ensure that weekend admissions did not adversely affect results. A reconciliation service for Saturday admissions is planned for the future as part of an extended clinical service on the weekends.

Finally, phase 5 (February 2013 to date) is focussed on publicising the methods and promoting good practice. The current number of participating wards is 14, with 350 patients assessed each month.

Information from wards is reviewed on a 6-monthly basis or earlier if the data collection process indicates any issues with medicines reconciliation. Medicines management technicians identify 5 randomly selected patients each week and audit their reconciliation process using a data collection form. They examine, date of admission, patient identification code and determine whether reconciliation occurred within 24 hours after admission. The form is sent to the pharmacy team and is used to update the electronic audit tool. The information generates a monthly report showcasing Trust-wide data, which can be analysed ward by ward.

Time taken to implement

In this example time taken to start and embed the initiative for a 5-day week was 3 years. A further 2 years was used to extend the

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	<p>initiative to weekends and improve the process based on learning over time.</p> <p>Regular reviews of the process are needed to maintain the rigour and quality of the medicines reconciliation process, as well as to strengthen the initiative through continuous learning.</p>
Ease of implementation	Affects a whole organisation across a number of teams or departments
Level of support and commitment	Good buy-in and participation was achieved from all the stakeholders involved. Success of the initial phases led to creating extra staff capacity to ensure continued improvement of the medicines reconciliation process within the Trust.
Barriers to implementation	<p>The initial application for funding of the project using the NICE/NPSA toolkit in 2008 was unsuccessful. The project team therefore redesigned the services, prioritised medicines reconciliation work and changed practices – using more experienced pharmacists to perform the medicines reconciliation after admission. Any queries arising after transfer from the admissions ward were dealt with by junior pharmacists. This was a positive change that led to issues being resolved quicker, and sooner after admission, saving time and harm later in the admission.</p> <p>The resulting improvement of service led to securing funding for a dedicated pharmacist for medicines reconciliation and specialist posts that contributed to the project in 2009.</p>
Risks	There are no highlighted risks associated with the initiative. Implementation of the project leads to a potential reduction in risk to both patients and staff because it helps to eliminate possible risks from patients being given either the wrong prescription or medicines that could interact with their current medicines regime.
Supporting evidence	Project documents and audit reports have been provided.

Further evidence

Dependencies	<p>Key to the success of this project has been the cooperation between relevant stakeholders such as the pharmacists, medical, nursing, clinical audit and support staff. This ensured that not only did medical reconciliation take place but data collection, audit and monitoring were established to guarantee the Trust achieved its target.</p> <p>The funding received by the project for pharmacist and speciality posts helped it achieve its target in phase 3 and has led to continued achievement of the target. If the 2009 funding</p>
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bid had been unsuccessful, it would have taken longer to achieve the target.

Contacts and resources

Contacts and resources

If you require any further information please email: qualityandproductivity@nice.org.uk and we will forward your enquiry and contact details to the provider of this case study. Please quote reference 15/0003 in your email.

1. NICE (2015) [Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes \(NG5\)](#).
2. NICE/NPSA (2007) Technical patient safety solutions for medicines reconciliation on admission of adults to hospital guidance ISBN 1-84629-563-7
3. Karnon J, Campbell F, Czoski-Murray C (2009) Model-based cost-effectiveness analysis of interventions aimed at preventing medication error at hospital admission (medicines reconciliation)
4. Smith J, Hamer J, Mundell A et.al. (2014) [Improving medicines reconciliation on admission](#)
5. Smith J, Arthure P, Riley S et.al. (2014) [Medicines reconciliation on admission: further issues](#)

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