
Using behaviour change and implementation science to embed National Patient Safety Agency guidance within NHS organisations

Safety Improvement Project Report for the
Yorkshire Regional Innovation Fund

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Executive Summary

Introduction. Implementation of NPSA alerts is rarely straightforward and compliance can be difficult to demonstrate and sustain. Implementation often requires behaviour change by health professionals, and as such there needs to be consideration of a range of technical, psychological and socio-cultural factors when designing an implementation package.

Aim. This safety improvement project aimed to use a behaviour change approach to support the implementation of NPSA alerts in four Trusts (6 hospitals) across the Yorkshire and Humber region.

Methodology. A framework for eliciting behaviour change was established, which incorporates a six step process of implementation based on the theoretical domains framework (TDF) of behaviour change (Michie et al., 2005), and principles of implementation science 1) forming a steering group of multidisciplinary staff, 2) identifying the target behaviour(s), 3) identifying local barriers to performing the target behaviour, 4) co-developing evidence based strategies with staff to address local barriers, 5) implementing interventions, 6) evaluation.

Findings. We focused on the following NPSA alerts using our framework for eliciting behaviour change: a) reducing the risk of feeding through misplaced nasogastric (NG) tubes (3 Trusts); b) reducing the risk of midazolam injection overdose in adults (2 Trusts), c) promoting safer use of injectable medicines (Gentamicin; 1 Trust), and d) medicines reconciliation (1 Trust). The results indicate statistically significant and clinically significant changes in target behaviours in all of the five evaluations undertaken to date following intervention implementation.

Discussion. Key points to note focus around: 1) the importance of identifying the main behaviour of concern to address, 2) the value of assessing barriers to behaviour change (compliance), and 3) the feasibility, acceptability, and generalisability of the behaviour change approach.

Challenges. Development and use of the framework for implementation has been challenging and time consuming. However, the impact on alert compliance suggests improved patient safety across wards, departments, and in some cases, Trust-wide.

Sustainability. The next phase of this work will be to train quality improvement professionals in the use of this process for the implementation of quality and safety guidance; such an approach might increase the generalisability and transferability of this model across NHS organisations, and for the implementation of a wide range of quality and safety guidelines.

Conclusion.

This project demonstrates the potential for a behavioural change approach for the effective implementation of national guidelines in a NHS Trust. Statistically and clinically significant improvements were seen for each of the completed projects indicating the potential for theoretically underpinned and pragmatic interventions to deliver a positive impact.

Full Report

Introduction

Patient safety alerts (guidelines) are issued by the National Patient Safety Agency (NPSA) to the NHS in response to analysis of reported patient safety incidents and other safety knowledge. Implementation of NPSA alerts is rarely straightforward and compliance can be difficult to demonstrate and sustain. The traditional 'top-down' approach to implementing patient safety alerts often involves assigning a lead, developing/updating a policy and disseminating via email, and the provision of training (where necessary, and if resources, etc. are available). Following these actions, improvement to practice is expected. However, implementation of NPSA alerts requires behaviour change by health professionals, and as such there needs to be consideration of a range of technical, psychological and socio-cultural factors when designing an implementation package.

Taking the example of an alert released to help NHS organisations to reduce the risk of feeding into misplaced nasogastric tubes, there are a number of behaviours involved in this procedure and included in the alert guidelines, some of which may be bigger areas of concern than others. For example, there may be concerns related to a) making the correct decision to insert an NG tube (is it necessary), b) inserting the NG tube, c) checking that the tube is in the right place, d) sending the patient for an x-ray, e) reading the x-ray, f) maintaining the position of the tube, g) checking the position of the tube has been maintained? For each of these behaviours, the root of the problem may not be investigated. For example, barriers to performing the above behaviours correctly may be related to one or a number of the following factors: skills, confidence, fear/anxiety, habit, influence of other people, equipment, etc.

We have developed a bottom-up approach to implementation that gives autonomy to local experts and allows them to develop interventions that recognise complexities and ambiguities of factors influencing safety in their own context. Using our expertise and evidence around behaviour change and implementation science, we have developed a flexible and transferable approach for working with stakeholders to implement guidelines. The approach can be used to work with staff to identify the target behaviour(s) to change, the barriers to behaviour change, to develop interventions to address the key barriers, and to establish a way for teams to monitor their own improvement.

Aims

This safety improvement project aimed to use a behaviour change approach to support the implementation of the following NPSA alerts across four Trusts (6 hospitals) across the Yorkshire and Humber region:

- Reducing the harm cause by misplaced nasogastric feeding tubes (Trusts A, B, C)
- Reducing the risk of overdose with midazolam injection with adults (Trusts A, D)
- Safer use of injectable medicines (Trust B)
- Medicines reconciliation (Trust D)

Objectives were to:

- 1) Demonstrate the Trust baseline level of compliance with the NPSA alert guidelines
- 2) Identify the barriers to implementation of the NPSA alert using a psychometric questionnaire
- 3) Identify and implement evidence-based implementation strategies to support behaviour change
- 4) Test whether this approach leads to increased levels of compliance

Methodology

During the planning phase of this work, the HIEC team established a series of six implementation steps to work through with the teams from each organisation.

Step 1. Forming implementation teams

Implementation teams were formed in each hospital to focus on the chosen NPSA alerts, with a clinical team leader, and a multi-disciplinary group of staff. Teams were presented with our implementation approach and agreed to participate on this basis. The HIEC team facilitated the organisation of implementation team meetings, which were held once approximately every 6 weeks with each trust.

Step 2. Identification of a target behaviour

The HIEC team encouraged and facilitated the implementation teams to audit current practice in the area of the alert using audit tools (i.e., designed to collect information for patients who had undergone nasogastric tube insertion, received gentamicin – an injectable medicine, received midazolam, or had medicines reconciled) that had been co-developed to confirm target behaviours that had been suggested based on discussions with staff. For Trusts focussing on the same alert, audit tools were shared and amendments were made to allow the measures to be relevant to specific contents. An example of an audit tool can be found in Appendix 3a.

Step 3. Understanding barriers to performing the desired behaviour

A questionnaire [Professional Patient Safety Behaviours Questionnaire (PPSBQ); example provided in Appendix 3b] was designed, based on a theoretical framework (Michie et al., 2005), to assess the barriers to performing each of the target behaviours. The questionnaire assesses 11 types of barriers that might prevent behaviour change (knowledge, skills, beliefs about consequences, motivation and goals, emotion, social influences, beliefs about capabilities, environmental context and resources, professional role and identify, action planning). Questionnaires were distributed to relevant healthcare professionals for each alert in both a paper copy and online format.

Step 4. Devising intervention strategies to address identified barriers

Following analysis of the questionnaire data, implementation team members organised focus groups at each hospital with multi-disciplinary groups of staff from various wards/departments. Members of staff were informed that the purpose of the focus group was to: 1) discuss views regarding the target behaviour, and 2) devise interventions to overcome any barriers faced to performing this behaviour with guidance from evidence based behaviour change literature (Abraham and Michie 2008; Craig et al. 2008; Michie et al. 2008).

Step 5. Intervention implementation

For each Trust, a report was produced for senior management (those who initially endorsed this project within their hospital). This included an executive summary and full report explaining the approach taken to identify 1) the target behaviour, 2) predominant barriers to performing the target behaviour, and 3) interventions to address the barriers. The senior management team was then asked to approve the recommendations for interventions for implementation within the Trust. Once the report was returned with authorisation to implement specific interventions, the HIEC project team supported implementation team members to work through the process of implementing the strategies in each Trust.

Step 6: Evaluation plan

An evaluation plan was stipulated in 'step 1' for each Trust. This involved organising a post-intervention audit to determine the impact of the intervention on the performance of the target behaviour by staff within each organisation. Exit interviews were also planned in order for the project team to gain an understanding of the experiences of members of each Trust in using this approach to implement patient safety guidelines, and of the areas for improvement should this work be replicated in other Trusts or with other patient safety alerts.

Findings

This section will present results for each NPSA separately, including background information, an overview of the target behaviour(s) focussed on, the key barriers identified, matched interventions implemented, and a summary of the results found in each project.

Reducing the harm cause by misplaced nasogastric feeding tubes (Trusts A, B, C)

Background

Fine bore nasogastric (NG) tubes are frequently used in the clinical setting. The delivery of enteral feed through NG tubes that have been inadvertently placed in the respiratory tract is likely to lead to serious consequences. The most recent National Patient Safety Agency (NPSA) alert providing guidance to reduce the harm cause by misplaced nasogastric feeding tubes was released in March 2011 (NPSA/2011/PSA002), with a deadline for compliance of September 2011. Specific guidance within the alert includes: a) all patients should have a documented risk assessment, b) pH testing is the first line method to ensure that the NG tube has not been misplaced, with a pH between 1-5.5 indicating that the NG tube has been correctly placed in the stomach, c) that each test result is documented on a chart kept at the patient's bedside, and d) radiological examination is used only as a second line test when no aspirate can be obtained or the pH indicator paper has failed to confirm the position of the tube for the purpose of feeding.

Target behaviour

Audit results and informal discussions with staff indicated that the target behaviour to focus on for change was to increase the use of pH as the first line method for checking NG tube position. Using pH first line (and successfully obtaining and aspirate) would prevent the need to send patients for an X-ray, which has a range of positive implications for safety. These include, reduced exposure to radiation, reduced risk of X-ray misinterpretation, reduced risk of delayed

feeding, and reduced cost (each X-ray costs approximately £70-£100, whereas pH strips cost a few pence).

Key barriers and suggested interventions

Table 1 presents the key barriers found across the three Trusts, as well as an example of some of the matched interventions implemented. There were some similarities and some differences for the key barriers and implemented interventions in each Trust. Where key barriers were the same, interventions were shared across Trusts with the option of adaptation to ensure relevance to the local context.

Table 1. Example of key barriers and matched interventions for the NG tubes alert

Alert	Key barriers	Implemented interventions
NG tubes	Social influences	<ul style="list-style-type: none"> • Screensaver implemented with key messages targeting social influences • Awareness day and awareness week
	Emotion	<ul style="list-style-type: none"> • Screensaver implemented with key messages targeting emotion (Appendix 3c) • Posters implemented with key messages targeting emotion
	Environmental context and resources	<ul style="list-style-type: none"> • New documentation released (care pathway for NG tubes) • Radiology and wards systems change initiated • Enteral feeding nurse employed
	Knowledge and skills	<ul style="list-style-type: none"> • Faculty, nurse, and FY1 training with practical elements • E-learning package with video modelling procedure • Awareness week (also covers social influences)

Results

Table 2 presents the descriptive statistics for all three Trusts prior to and following intervention implementation. In each hospital, the Chi-square results show between baseline and post-intervention implementation, there were statistically significant increases in using pH as the first line method for checking tube position (Trust A: $\chi^2 = 16.03$, $p < .001$; Trust B: $\chi^2 = 4.38$, $p < .05$; Trust C: $\chi^2 = 44.72$, $p < .001$). Significant decreases were found in T1 and T3 in the use of x-ray, but not in T2; however, T2 did see a significant decrease in the number of times the tube was initially placed in radiology.

Table 2. NG tube audit descriptive statistics pre and post intervention implementation

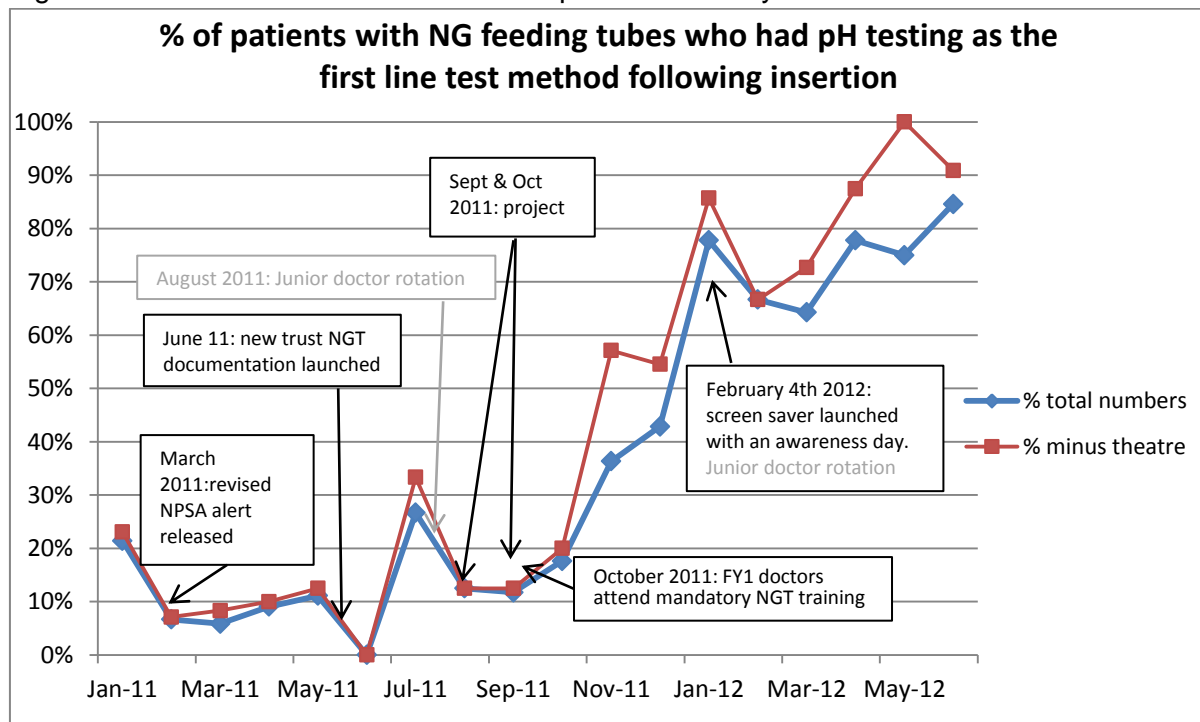
Audit information	Trust A		Trust B		Trust C	
	Pre	Post	Pre	Post	Pre	Post
Number of sets of notes audited	49	48	44	41	43	45
First line method used to check tube position						
pH of aspirate from stomach	20%	63%**	14%	33%*	12%	73%**
Patient sent for X-ray	51%	23%**	40%	41%	74%	9%**
Tube placed in radiology	N/A	N/A	36%	10%**	N/A	N/A

* $p < .05$; ** $p < .01$

Additional work was undertaken in Trust A to assess the impact of the interventions at specific time points on the target behaviour. Three hundred sets of case notes were audited between

January 2011 – June 2012 to assess the first line method used to check the position of NG tubes following initial insertion. Results (Figure 1) indicate that, the new documentation, junior doctor training, and awareness interventions were associated with increases in the use of pH over time.

Figure 1. Time series audit data on use of pH from January 2011 – June 2012



Each set of results presented for the work undertaken on the NG tubes alert represent a clinically significant change in the way that staff check position of the NG tube.

Reducing the risk of midazolam injection overdose (Trusts A, D)

Background

Acute care medicine practice often requires the performance of procedures that can cause pain and anxiety. Procedural, or ‘conscious’, sedation reduces the discomfort, apprehension, and potential unpleasant memories associated with such procedures and facilitates their performance (Frank, Wolfsten, & Grayzel., 2011). Midazolam is a short-acting drug in the benzodiazepine family and is used for treatment of acute seizures, moderate to severe insomnia, and for inducing sedation and amnesia before medical procedures. With large or repeated doses, midazolam accumulates in adipose tissue, and this can significantly prolong sedation (Absalom, Pledger, & Kong, 1999), and increases the risk of respiratory decompression in the recovery period (Harrison & Mayet, 2004). Furthermore, although flumazenil injection (500mcg/5ml) is licensed in the UK for the complete or partial reversal of the central sedative effects of benzodiazepines, routine reliance of this drug for patients who have been overdosed is not considered good practice due to the potential side effects; due to the shorter elimination half-life of flumazenil, residual sedation can unexpectedly return (Roche Pharmaceuticals, 2008).

In 2008 the National Patient Safety Agency (NPSA) issued a rapid response patient safety alert to ‘reduce the risk of overdose with midazolam injection with adults’ (NPSA, 2008). This followed the receipt of 498 reported midazolam safety incidents between November 2004 and November 2008, whereby 3 patients died and a further 48 were moderately harmed. Since the release of the alert, a further 417 incidents have been reported relating to wrong dose/strength errors, many (203) of which were related to administration of the medicine from a clinical area, and some (14) of which were related to monitoring/follow up (NPSA, 2012). The NPSA guidelines indicate that for adults, the intravenous injection of midazolam should be given slowly at a rate of approximately 1 mg in 30 seconds. In adults below the age of 60 the initial dose is 2 to 2.5mg given five to 10 minutes before the beginning of the procedure. Further doses of 1mg may be given as necessary. In adults over 60 years of age, debilitated or chronically ill patients, the initial dose must be reduced to 0.5-1.0mg and given five to 10 minutes before the beginning of the procedure. Further doses of 0.5 to 1mg may be given as necessary (Roche Pharmaceuticals, 2008).

Target behaviour

Audit results and informal discussions with staff indicated that target behaviours to focus upon for change differed across staff groups. Therefore, we worked with two behaviours: 1) to titrate doses of midazolam to individual patient needs (doctors), and 2) to ensure observations of patients who have received midazolam are taken every five minutes and up to at least 30 minutes after the last dose (nursing staff). Titrating according to patient needs would reduce the risk of midazolam overdose – and thus the potential for respiratory decompression – because each dose would be provided depending on the patient response to the previous dose. Taking observations in the manner described above would reduce the risk of a patient suffering from any adverse effects of midazolam.

Key barriers and suggested interventions

Table 3 presents the key barriers found across Trusts A and D, as well as an example of some of the matched interventions implemented. There were some similarities and some differences for the key barriers and implemented interventions in each Trust. Where key barriers were the same, interventions were shared across Trusts with the option of adaptation to ensure relevance to the local context.

Table 3. Example of key barriers and matched interventions for the midazolam alert

Alert	Key barriers	Implemented interventions
Midazolam	Social influences	<ul style="list-style-type: none"> • Screensaver implementation to raise awareness and have a social influence impact on staff members regarding best practice
	Environmental context and resources	<ul style="list-style-type: none"> • New documentation (care pathway) designed for trust and made bespoke for A&E • re-locating DC cardioversions to Theatres from the Cardiology Dept in order to ensure this procedure is undertaken using the safest possible practice • Re-design of A&E documentation for the use of conscious sedatives when undertaking joint reductions

Knowledge
and skills

- Development and release of the first Trust Sedation Policy
- E-learning package being developed based on a package shared by Scarborough

Results

Interventions have been implemented in Trust A to address key barriers and results of the final audit will be available in 2013. Intervention implementation is currently underway in Trust D, but has been subject to delays as a result of engaging with two geographically separate sites.

Injectable medicines (Trust B)

Background

The incidence of errors in prescribing, preparing and administering injectable medicines is higher than for other forms of medicine [National Patient Safety Agency (NPSA), 2007a]. Between January 2005 and June 2006, the NPSA received 800 reports relating to injectable medicines, and these represented 25% of the total reported medication-related incidents. Of these 24%, 25 led to death and 28 led to serious harm (NPSA, 2007b). As a result, the NPSA released an alert to promote safer use of injectable medicines (NPSA/2007/20).

There are several stages in the injectable medicines process, from the supply of drugs and their storage in the clinical area to drug prescription, preparation, administration, and monitoring the response to treatment (Thomas & Panchangnula, 2008). A number of reports have documented the harm or potential harm to patients that has occurred because of the multiple risks present in each of these stages. These failures in the medication administration chain often occur due to defects in several locations (Reason, 2000). One particularly complex medication that is susceptible to such defects is that of Gentamicin.

Gentamicin, one of a range of aminoglycosides, is used worldwide in the treatment of serious infection in critically ill patients (Hansen et al., 2001). However, due to the range of potential adverse nephrotoxic and ototoxic effects, and the narrow therapeutic index of Gentamicin (e.g., Balakumar, Rohilla, & Thangathirupathi, 2011; Amin & Fairuz, 2010), close monitoring of patients receiving this medication is vital. Optimal and safe dosage of gentamicin requires both a thorough knowledge of its pharmacokinetics and pharmacodynamics, as well as effective communication between a number of individuals in different locations, including the prescriber, administrator, microbiologist, and pharmacist. However, prescribing and monitoring is not easy to manage because of the range of individuals involved. The complex nature of this type of medication has resulted in a series of patient safety incidents, with almost 200 highlighted in a review by Thomas and Panchangnula (2008), whereby evidence indicated that Gentamicin was associated with the second largest number of medication-related patient safety incidents. Given these risks and the relatively high use of this medication in Trust B (as confirmed by the Deputy Chief Pharmacist), the focus of this work to support the implementation of the NPSA alert will centre around improving the use of Gentamicin in the Trust.

Target behaviour

Audit results and informal discussions with staff indicated that the target behaviour to focus upon for change was for junior doctors to take serum gentamicin levels between 6-14 hours of

a patient receiving gentamicin. This is important because the 6-14 hour window is the time at which the patient's response to gentamicin can be accurately assessed. Taking the levels before or after these time points can lead to the prescription of an inappropriate subsequent dose of gentamicin for the patient, or a delay in administration of the correct dose, which result in dangerous side effects ranging from poisoning to loss of balance. If blood levels are taken on time, the risks of gentamicin side effects are reduced.

Key barriers and suggested interventions

Table 4 presents the key barriers found across Trust B, as well as an example of some of the matched interventions implemented.

Table 4. Example of key barriers and matched interventions for the injectable medicines alert

Alert	Key barriers	Implemented interventions
Injectable medicines	Beliefs about capabilities	<ul style="list-style-type: none"> Stickers were confusing staff so no longer in use. Charts tested and implemented Training for pharmacy staff and junior doctor designed and delivered (also targeted <i>skills</i>) Weekly gentamicin audits and reports to highlight areas for improvement
	Environmental context and resources	<ul style="list-style-type: none"> Amended documentation to incorporate steps/roles through the process (also targeted <i>action planning</i>) Staff provided with list of FAQs around gentamicin processes, specific roles and responsibilities System changed so pharmacy obtain gentamicin levels to ensure doctors prescribe correct dose on time
	Emotion	<ul style="list-style-type: none"> Staff briefed on information about barriers found

Results of pre-post audit

Table 5 presents the descriptive statistics for gentamicin audits undertaken prior to and following intervention implementation. Chi square analysis indicated that there was no significant difference between T1 and T2 (both pre-intervention implementation) for the number of times the first level of gentamicin was taken correctly (i.e., between 6-14 hours). However, there was a statistically significant improvement in the number of times the first level of gentamicin was taken correctly between both T1 and T3 (post-intervention implementation), and T2 and T3 ($\chi^2 = 9.00, p < .05$).

Table 5. Baseline, pre-, and post-intervention implementation audit of gentamicin practices

SPECIALIST AREA	July 2011 (baseline)	Feb 2012 (pre-intervention)	Aug 2012 (post-intervention)

Number of notes audited	25	18	22
Monitoring following first dose			
First level taken correctly	15 (60%)	10 (55%)	21 (95%)*
First level taken too early(<6 hours)	0 (0%)	0 (0%)	0 (0%)
First level taken too late (>14 hours)	3 (12%)	6 (33%)	1 (5%)
First level random or difficult to interpret	2 (8%)	1 (5%)	0 (0%)
First level not taken at all	5 (20%)	1 (5%)	0 (0%)

* $p < .05$

These results represent a clinically significant change in the proportion of patients receiving correct first level doses of gentamicin: Only half were receiving the correct dose at baseline and pre-intervention but after the intervention virtually all received the correct dose.

Medicines reconciliation (Trust D)

Background

Accurate medication histories at the time of hospital admission are an important element of medication safety (Vincent et al., 2005). Many studies have reported that the medication history documented in patients' medical records by physicians is often inaccurate, incomplete, and generally sketchy (Beers, Munekata, & Storrie, 1990; Glinborg, Andersen, Spang-Hanssen, & Dalhoff, 2004). Errors can occur at a number of stages during the admission process, including when a) determining the medication a patient is currently taking, from written records, accounts from the patient, their families, or carers, b) transcribing details of the patient's medication to the hospital clinical record, c) prescribing medication for the patient after admission [National Patient Safety Agency (NPSA); National Institute for Health and Clinical Excellence (NICE), 2007. Prescription medication history errors at the time of hospital admission are disturbingly common and potentially harmful to patients (Vincent et al., 2005; Frank et al., 2001; Manley, Drayer, McClaran, Bender, & Muther, 2001; Cornish et al., 2005).

In 2007, a systematic review (Dillon et al., 2007) reported unintentional variances of 30-70% between the medications patients were taking before admission and their prescriptions on admission. As a result, the NPSA released an alert to provide clinicians with guidance on medicines reconciliation in conjunction with NICE: NICE/NPSA/2007/PSG001 "Technical patient safety solutions for medicines reconciliation on admission of adults to hospital". The alert stated that the aim is to ensure that medicines prescribed on admission correspond to those that the patient was taking before admission (NPSA, 2007). Guidelines in the alert include that healthcare organisations should ensure that:

- Standardised systems are specified for collecting and documenting information about current medications, and policies for medicines reconciliation on admission
- Pharmacists are involved in medicines reconciliation as soon as possible after admission
- The responsibilities of pharmacists and other staff in the medicines reconciliation process are clearly defined; these responsibilities may differ between clinical areas
- Strategies are incorporated to obtain information about medications for people with communication difficulties.

Target behaviour

Audit results and informal discussions with staff indicated that target behaviours to focus upon for change differed across staff groups. Therefore, we worked with two behaviours: 1) collate a complete and accurate record of patient medications on admission to hospital (doctors), and 2) communicate issues identified during medicines reconciliation in a manner that ensures the responsible doctors will appropriately amend the prescription (pharmacists). Undertaking each of these behaviours would reduce the risk of incorrect prescriptions or administration of incorrect medication/doses.

Key barriers and suggested interventions

Table 6. Example barriers and matched interventions for the medicines reconciliation alert

Alert	Key barriers	Implemented interventions
Medicines reconciliation	Social influences	<ul style="list-style-type: none"> • Screensaver with key messages targeting social influences
	Environmental context and resources	<ul style="list-style-type: none"> • Meetings held to discuss medicines reconciliation form completion instructions changes • Screensaver released with messages about using clearly printed writing, telephoning wards to communicate discrepancies, reminding to ask patients about specific medicines

Results

Table 7 presents the descriptive statistics for the medicines reconciliation audits undertaken from the medical admissions unit (MAU) in Trust D prior to and following intervention implementation. Paired *t*-test results demonstrated a significant reduction in the mean number of discrepancies found [*t* (22) = 4.48, *p* < .01], and number of drugs omitted [*t* (19) = 3.85, *p* < .01]. Chi-square analysis indicated a significant reduction in the number of spelling errors on prescriptions ($\chi^2 = 4.75$, *p* < .05), and a significant increase in the number of discrepancies/errors communicated to clinical staff by pharmacists ($\chi^2 = 15.28$, *p* < .001).

Table 7. Pre-, and post-intervention implementation medicines reconciliation audit

Medicines reconciliation audit information	Pre	Post
Mean discrepancies overall (Drs)	3.5	2.5**
Mean discrepancies for omitted drugs (Drs)	3	2.4**
% discrepancies relating to spelling mistakes (Drs)	31%	3%*
% errors that were communicated (Pharmacists)	48%	83%***

p* < .05; *p* < .01; ****p* < .001

These results represent a clinically significant change as spelling mistakes routinely occurring in one third of prescriptions before the intervention have been shown to be virtually eliminated.

Discussion

This safety improvement project aimed to use a behaviour change approach to support the implementation of NPSA alerts. We developed and implemented a six step process of 1) forming implementation teams, 2) identification of a target behaviour, 3) identifying barriers to performing the desired behaviour, 4) devising intervention strategies to address identified barriers, 5) intervention implementation and 6) evaluation. For the five projects completed so far, results indicate that there have been significant improvements in each of the behaviours targeted for each alert following intervention implementation.

Using the behaviour change approach has allowed for a detailed insight into the challenges hospital staff face when attempting to comply with NPSA alerts/patient safety guidance. Reflective points to note focus around: 1) the importance of identifying the main behaviour of concern to address – requesting that staff change multiple behaviours simultaneously (i.e., traditionally staff are asked to comply with all alert guidelines) may be less effective than undertaking detailed investigation to identify and address the key behaviours of concern (e.g., using pH as the first line method for checking tube position, taking blood levels of gentamicin patients between 6-14 hours, compiling a complete inpatient prescription, communicating discrepancies effectively), 2) the value in assessing barriers to behaviour change (compliance) – the carefully constructed questionnaire is a speedy method to assess barriers to compliance, which can provide an objective account of staff perceptions, and which can be followed up with more detailed discussions. Had the questionnaire not been used, it is likely that the impact of social influences, emotion, and environmental context and resource-related barriers on the behaviours in question would not have been identified through a traditional audit, and 3) the feasibility, acceptability, and generalisability of the behaviour change approach – now that the groundwork has been undertaken to develop the behaviour change method in the context of complying with four patient safety alerts in five Trusts, the repeatability of this approach for other alerts and/or in different hospitals is a feasible and realistic option.

Challenges

Development and use of the framework for implementation has been challenging and time consuming. Particular challenges have included gaining and maintaining engagement from implementation team members, especially in those cases where the implementation teams have been small (e.g., 3-4 members) and key staff members have not been represented (e.g., nurses). Proactive steering group members were crucial in ensuring that audits are undertaken in a timely manner, and interventions are implemented across Trusts. However, this kind of work relies on good will of enthusiastic members of (already very busy) staff who have an interest in safety, as well as a dedicated lead to steer the project forward. Furthermore, the test for those Trusts who were successful in achieving behaviour change is to sustain these changes, and make continued improvement.

Sustainability

Now that the framework has been established and used in five hospitals for four different alerts, we have a range of resources developed to enable organisations to navigate themselves through the process of implementing a new guideline, including:

- A framework for implementation
- Audit tools to identify the relevant target behaviour for change
- Validated questionnaires to identify barriers to behaviour change
- Discussion schedules to use with front line staff to elicit additional information about barriers to behaviour change, and to generate ideas for interventions to overcome key barriers
- A range of adaptable intervention resources that can be tailored to specific types of barriers

Further work is required to confirm these results and explore how the model can be adopted for future quality and safety improvement initiatives. For example, the pre-post nature of this improvement project is a limitation; future research should be undertaken using a more robust design, such as a cluster randomised controlled trial or a quasi-experimental time series design, to eliminate the impact of potential confounding factors.

Furthermore, work needs to be completed to refine this approach such that resources/staff time required to manage and deliver these projects is feasible. The next phase of this work will be to train quality improvement professionals in the use of this process for the implementation of quality and safety guidance. The first workshop is scheduled for March 2013. This approach is intended to increase the generalisability and transferability of this model across NHS organisations, and for the implementation of a wide range of quality and safety guidelines.

Conclusions

This project demonstrates the potential for a behavioural change approach for the effective implementation of national guidelines in a NHS Trust. Statistically significant and clinically significant improvements were seen for each of the completed projects. These results indicate the importance of identifying appropriate, contextual, and staff-group relevant target behaviours for change, and the potential for theoretically underpinned and pragmatic interventions to have a positive impact on behaviour change.

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