Standardising and centralising infusion devices - a project to develop safety solutions for NHS trusts
Evaluation – executive summary
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- Two baseline assessments
- Usability questionnaire
- Centralisation advice (business case scoping)
- Economic appraisal indicator (spreadsheet)
- Patient information leaflet
- PaSA-hosted website
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www.pasa.nhs.uk/infusiondevices
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Introduction

The NPSA infusion device project was set up in June 2002. It came in response to data from the Medicines and Healthcare products Regulation Agency (MHRA) regarding the number of infusion device incidents associated with user error, the project’s aim was to find the root causes of these incidents and establish solutions to prevent their recurrence.

The project identified that uncontrolled purchasing and device management – in the absence of competency-based training – were contributing factors in causing infusion device incidents. A range of solutions have been developed to assist trusts to Buy Right, Manage Right and Use Right infusion devices. The purpose of these solutions is to promote standardisation, centralisation and competency training which will, over time, improve patient safety.

Three solutions have been tested and evaluated in six pilot sites across England and Wales, focusing on the Buy Right and Manage Right issues.

A fourth solution focusing on competency-based training (Use Right) is also being developed separately in collaboration with the NHS University (NHSU).

The full pilot study evaluation report can be found on the NPSA website: www.npsa.nhs.uk

A patient information leaflet, the content of which was proposed and agreed by patients, has also been developed. This product evaluated very well in pilot sites and will be signposted as part of the toolkit-supporting information section. NHS staff will be able to download/print the leaflet direct from the NHS Purchasing and Supply Agency (PaSA) website: www.pasa.nhs.uk/infusiondevices
Baseline assessments in pilot sites

Six pilot sites were recruited from an ‘expression of interest’ list of 93 in response to an advertisement placed in the Department of Health Chief Executive Bulletin. The following NHS trusts participated:

- Hull and East Yorkshire;
- Leeds Teaching Hospitals;
- North Cheshire;
- Blackpool Fylde and Wyre;
- Cardiff and Vale;
- Epsom and St Helier.

The purpose of baseline assessments is to establish the need for solutions. Comprising 22 specific evaluation criteria, the assessments were carried out in each pilot site to provide a benchmark against which action could be planned and progress measured.

**Baseline assessment 1:** This focused pilot sites to review existing processes from which purchasing decisions were made and to compare this against good practice recommendations. National recommendations such as Controls Assurance Standards (CAS), Clinical Negligence Scheme for Trusts (CNST) and the Welsh Risk Pooling Scheme provided good practice guidance.

**Baseline 1 findings:** Pilots could not identify key stakeholders in their decision-making systems. Stakeholder meetings were fragmented and inconsistent. It was also clear that there was a need to produce clear policies and guidelines as well as the need to develop a purchasing tender to achieve standardisation.

**Baseline assessment 2:** This assisted pilot sites in establishing data that identified infusion device numbers, range and cost, incident data and maintenance/management issues (device utilisation). From this data, the scope of development could be determined.

**Baseline 2 findings:** It was established that each pilot site held on average a stock of around 1,065 infusion devices, comprising a range of 31 different devices, at a cost of £1.6m. For most of the time 65% of available stock was not used. Over a one-year period 321 related adverse incidents were reported over all pilot sites, but no deaths were reported. The five main incident groups identified were: 96 over-infusion episodes; 21 under-infusion episodes; 59 user error episodes; 12 device failures and 10 tampering episodes (all involving patients).

It was evident from pilot site baseline data that there was scope for improvement. The range of solutions would assist trusts to address their specific problems.
Solutions evaluation

To measure the impact of solutions, two evaluation methods were used.

Method 1

This method involved an evaluation of the impact of solutions in pilot sites. Following implementation of solutions all pilot sites have developed and improved their decision-making processes. They can now identify key stakeholders, have established appropriate decision-making forums and are developing, or have developed, policies and guidelines.

Five pilot sites are developing a purchasing tender with the aim of standardisation. The sixth pilot site, Cardiff, had already achieved this – but stated that the proposed solutions would have undoubtedly helped the process.

Five pilots have developed, or are in the process of developing, a business case for equipment centralisation. Cardiff, the exemplar site, opened their equipment library in September 2003.

Method 2

This method involved an evaluation of the infusion device pilot process. This required judgements from pilot site leads and their colleagues as to how they believed the solutions testing had helped their system to develop and improve. A ranking was used to gauge these views and ranged from:

6 (excellent improvement) … to … 1 (worsened situation)

The overall impact of the infusion device project ranked 4.61 (moderate to good). The need for senior management ‘buy in’ was highlighted as vital to the success of solutions implementation. The solutions website design ranked 4.2 (moderate to good), with web information content ranking 4.6 (moderate to good).

How helpful solutions were in identifying what ‘needed to be done’ ranked 5.7 (good to excellent). In particular the business case for the equipment library was singled out as most helpful. Baseline assessments were ranked 5.4 (good to excellent).

Solution 1 ranked 4.4 (moderate to good). It was felt to be very good in identifying strengths and weaknesses.

Solution 2 ranked 3.75 (minor to moderate). This had less of an impact, possibly due to the design of the form and web access problems during testing. This evaluation has been fed back to Bath Institute of Medical Engineering (BIME) who are managing this element.
Solution 3 ranked 4.0 (moderate to good) and was felt to be very useful. Overall the project process evaluated extremely positively and was felt to be a worthwhile exercise. It pulled together key stakeholders and provided good focus in areas that required development. Support from NPSA also evaluated well and contributed to the positive outcomes.

**Pilot sites identified six success factors:**

1. Support from senior management (chief executive, finance director).
2. Stakeholder representation in the process.
3. The baseline assessments and solutions.
4. A single focus (pilot lead) within trusts to coordinate solutions development.
5. The national profile of the project and support from NPSA.
6. The use of photographic evidence to highlight current maintenance and storage issues.
Recommendations for roll out of solutions to NHS

This evaluation has confirmed that solutions have had a positive impact by assisting pilot sites to carry out structured reviews; develop and improve their systems; and identify opportunities to make significant financial savings. The ultimate aim of the solutions is to improve patient safety.

Integration of pilot learning from evaluation

The recommendations and learning from the pilot evaluation have been incorporated into the existing solutions.

In response to baseline assessment 2 findings, work has been conducted - in collaboration with the Department of Health – to illustrate the economic impact that the solutions have had on pilot sites. This will provide the financial evidence to encourage others to review and develop their systems. A spreadsheet has been designed to assist trusts in developing their own local economic appraisal and is available as part of the solutions toolkit.

Rollout and sustainability

An area on the PaSA website has been made available to host the solutions toolkit.

The solutions are:

1. A checklist to ensure objective purchasing decisions and promotion of standardisation.
2. An infusion device usability evaluation questionnaire.
3. Advice on how to develop a business case for centralisation.

In order to communicate the benefits of the solutions and the evidence underpinning their development, the NPSA will also issue advice to trusts on centralising and standardising infusion devices. This guidance will be targeted at key influencers such as chief executives and finance directors. Key implementers such as clinical engineering managers, clinical governance/risk management leads, board members and others will also be engaged to promote uptake of solutions.

Many of the recommendations contained within the solutions already form part of a number of national inspection schemes such as Controls Assurance Standards and CNST.

Evaluation of the impact of solutions on trusts

Due to the long-term nature of solutions – with the measurement of
their full impact unlikely for at least two years – evaluation is recommended to be measured in two ways:

- **Evaluation 1:** Carry out a review on the uptake of solutions following the launch of the infusion device solutions. This can be achieved fairly quickly and would require only high level information. This review is recommended to be carried out within the first year. PaSA have agreed that the solutions element of the website can be accessed through a registration process that records which organisations/persons are accessing each solution. This will help inform NPSA on the spread and nature of uptake.

- **Evaluation 2:** A reappraisal of baseline assessments 1 and 2 to be carried out at yearly intervals post-implementation.
Conclusion

The project has evaluated extremely positively. The solutions clearly identified device management issues and have assisted pilots to develop and improve their systems.

Predicted common issues emerged to provide evidence confirming that infusion device management is a national issue. The solutions will certainly assist other NHS trusts to improve medical devices management arrangements.

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We recognise that healthcare will always involve risks. But that these risks can be reduced by analysing and tackling the root causes of patient safety incidents. We are working with NHS staff and organisations to promote an open and fair culture, and to encourage staff to inform their local organisations and the NPSA when things have gone wrong. In this way, we can build a better picture of the patient safety issues that need to be addressed.