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- A whole-system approach to help prevent misplacement of nasogastric tubes
- How an e-learning tool was developed to increase competence and confidence in staff
- Establishing formal monitoring and reporting systems to improve patient safety

Improving safety with nasogastric tubes: a whole-system approach

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Key points

Misplacement of nasogastric tubes resulted in 95 never events between 2011 and 2016

Agreeing standards can help to change staff culture in terms of their approach to tube insertion

Having input from families who have experienced never events is a powerful way to develop staff training

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Abstract Misplacement of nasogastric tubes can have disastrous consequences for patients and is listed as a “never event” by NHS England. When Lancashire Teaching Hospitals NHS Foundation Trust had two of these never events, the nutrition nursing team carried out a system-wide evaluation to identify problems and develop plans to address them. An e-learning package, robust standardisation in staff’s approach to patient care, re-setting “red lines” to support and empower staff, and the introduction of monitoring and reporting systems have contributed to improving patient safety.

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Nasogastric (NG) tube insertion is a procedure that is commonly performed. However, misplacement can have disastrous consequences for patients and has been listed as an NHS England “never event” since 2005, (NHS Improvement, 2016; National Patient Safety Agency, 2005). Two such events occurred at Lancashire Teaching Hospitals NHS Foundation Trust (LTHTR).

To improve safety for patients, the nutrition nursing team took an innovative multifactorial approach that included education and training, with the development of a new e-learning tool designed to educate staff and assess their competence. There was also robust standardisation in the approach to care for patients with an NG tube, alongside monitoring and reporting systems to assure the trust’s board.

Initially, we decided to undertake a system-wide evaluation of the problem to identify gaps and plan to address them. It became clear there were multiple issues where there was potential for error. We found nursing and medical staff sometimes worked in silos without necessarily

understanding each others’ responsibilities, and there was a lack of standardised documentation. There was also the potential for staff to not be challenged about a decision due to the escalation process not being clear, and no formally agreed dataset to audit compliance with practice. We also discovered that 90% of advanced nurses and doctors who were involved in confirming the NG tube position on X-ray had received no specific training.

At the same time, NHSI released an improvement alert requiring organisations to be compliant in 33 areas, including training (NHSI, 2016). However, the alert included little advice on how this could be achieved. I was identified as the trust’s lead on the initiative to improve NG tube safety and realised only a whole-system approach would work.

Aims of the initiative

We found lots of resources to support nurses’ and doctors’ education and training, but there was a gap in how to assess competency – particularly in using X-rays to confirm NG tube position. We needed several things, including clear

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guidance around tools for bedside confirmation, and a standard approach to documentation. With regards to chest X-ray interpretation of NG tubes, we also decided to design an e-learning package, co-designed with clinical colleagues and relatives of a deceased patient who had experienced a never event (unrelated to their death). To ensure we could evidence a capable workforce at LTHTR, we worked to:

- Add an assessment function into the e-learning tool;
- Make it mandatory for all staff.

To make things easier and more-memorable for staff, we developed a five-point approach using the mnemonic NEX, 2Cs and 2Ds to highlight the required areas to review on chest X-ray: the measurement from the **N**ose to **E**ar to **X**yphoid process (NEX), then the anatomical landmarks **C**arina, **C**lavicle (2Cs) **D**iaphragm and **D**eviation (2Ds).

We also wanted to standardise documentation of these findings. Initially this came in the form of a sticker in the notes but it has since has been rolled out digitally as part of the electronic patient record.

To empower staff, we felt it was important they knew they had permission to challenge each other as a “critical friend” if queries existed with NG tube placement and to ensure there were clear lines of escalation. We aimed to reset our whole approach to NG tube insertion and feeding as a trust, and to agree standards or “red lines” from which we would not deviate. To audit our approach, it was also important to monitor compliance and have an exception report, which is imbedded within the electronic audit system at LTHTR.

Changing the culture

A huge team was involved in the initiative. Nutrition nurses helped with the implementation of standards and audit. The team also included a consultant radiologist and the blended-learning team, which comprised experts to help design the e-learning package and continue to manage the whole IT package.

To create a sense of ownership of the initiative and give staff a real sense of what a never event means, we had involvement from a family affected by such an event at the trust; they helped to co-design the training package. Involving the family was emotional for all of us but extremely powerful – their story clearly articulated what went wrong and how it could have been avoided. The family’s experience engaged staff and helped them to understand the importance of owning the changes.

Work on the whole-system approach began in 2016 and, after a series of tests and changes just over one year later, it was implemented. It had the support of NHSI and the National Nurses Nutrition Group. In addition, other NHS trusts became aware of our work and began asking for the e-learning tool and further information; to date more than 26 have been given the tool.

*“If this project were to be implemented nationally this would reduce patient harm from incorrect technique”
(Judges’ feedback)*

What have we achieved?

An improved capable workforce translates into improved patient safety. Evidence from a formal evaluation of the e-learning tool clearly demonstrates a statistically significant improvement in the workforce’s capability. There was a significant increase in:

- Confidence in correctly confirming the NG tube position using chest X-ray (pre-training median score 7, post-training 9, P -value <0.01);
- Describing the anatomical landmarks on chest X-ray (pre-training median score 7, post-training 9, P -value <0.01);
- Training a colleague in chest X-ray interpretation (pre-training median score 6, post training 9, P -value <0.01).

Staff said they were satisfied that the e-learning tool addressed challenges of NG tube insertion and the importance of the correct way to confirm position. Compliance with completing the e-learning tool is almost 95% of staff involved in confirming NG tube positioning, giving a high degree of assurance of a competent workforce.

Following the successful pilot, completion of the e-learning tool is now mandatory for all medical and advanced nurses in the

trust who care for patients with NG tubes. Combined with standardised documentation, and rigorous audit and reporting, this innovation has addressed and improved the safety of patients with NG tubes.

Next steps

The team worked with NHSI and Health Education England to look at enabling the process to be shared widely, and HEE adopted the e-learning tool as part of its educational platform. While LTHTR retains the intellectual property for the tool, it is offered as a free resource to any UK organisation and we wish to share this. The e-learning tool has had a huge impact on patient safety, and has been adopted by many other NHS trusts and HEE as a safety and training resource to improve patient care and avoid never events.

In terms of research, we wanted to evaluate emerging innovative solutions that may further improve patient safety in the future. With a view to looking at future solutions, I am now principal investigator for one research trial and chief investigator for a multi-centre trial looking at alternative technology to further improve NG tube safety. I continue in my role as consultant nurse (nutrition) and am the clinical lead for the nutrition nursing team, which has a unique seven-day services approach. I also continue with my medical role as associate divisional director for surgery – one of the key areas that helped facilitate this whole-system approach. **NT**

- If you would like to contact Tracy Earley about this project, please email: tracy.earley@lthtr.nhs.uk

References

- National Patient Safety Agency** (2005) *Reducing the Harm Caused by Misplaced Nasogastric Feeding Tubes*. [Bit.ly/NPSANasogastric2005](http://bit.ly/NPSANasogastric2005)
- NHS Improvement** (2016) *Nasogastric Tube Misplacement: Continuing Risk of Death and Severe Harm*. [Bit.ly/NHSINGAlert2016](http://bit.ly/NHSINGAlert2016)

Advice for setting up similar projects

- Don’t underestimate the incentive to drive change that results from a locally owned problem
- Track the patient pathway and see where it can fall down at every level; tackling one area is usually not enough – a whole-system approach is needed to address serious incidents
- The power of patient stories is invaluable
- Find a “hook” to engage executive teams – for example, provide evidence of trust board-level assurance and a supportive executive sponsor
- Use continuous improvement methodology tools such as PDSA (Plan, Do, See, Act) to refine your approach. Accept that it is healthy and valuable to learn from your experiences and look at what works well and what needs to change