

Industry case study

Preventing harm caused by misplaced feeding tubes



NIHR Yorkshire and Humber Patient Safety Research Collaboration

Healthcare problem

A nasogastric (NG) tube is a plastic feeding tube used to provide adequate nutrition, hydration and medication to patients with swallowing difficulties. If positioned incorrectly, it can result in serious harm to a patient, particularly if fluids such as food or medicine enter the lungs instead of the stomach. This is classified a 'never event' in the NHS, meaning that it should never happen; however, limitations of current equipment mean that it still occasionally occurs. Because current methods of bedside testing are unreliable and subjective, many patients are sent for an x-ray to confirm if the tube is correctly positioned. This adds pressure to radiology departments as well as delays in patients receiving timely nutrition and medication.

Innovation

The NG-Sure project aimed to investigate the feasibility of developing an in vitro diagnostic device capable of rapidly and objectively determining whether an NG tube is correctly positioned in a patient's stomach.

Roboscientific, a UK-based biotechnology company, already had a benchtop e-nose device used in the agricultural sector, which can 'smell' differences between gaseous environments. Our project set out to explore whether this existing technology could be feasibly repurposed for a medical application.

The resulting prototype device was tested to assess whether a future medical device based on this technology would be practical in a clinical setting, and to provide early indications of whether the sensors could reliably distinguish lung gas from stomach gas to deliver the objective output required.



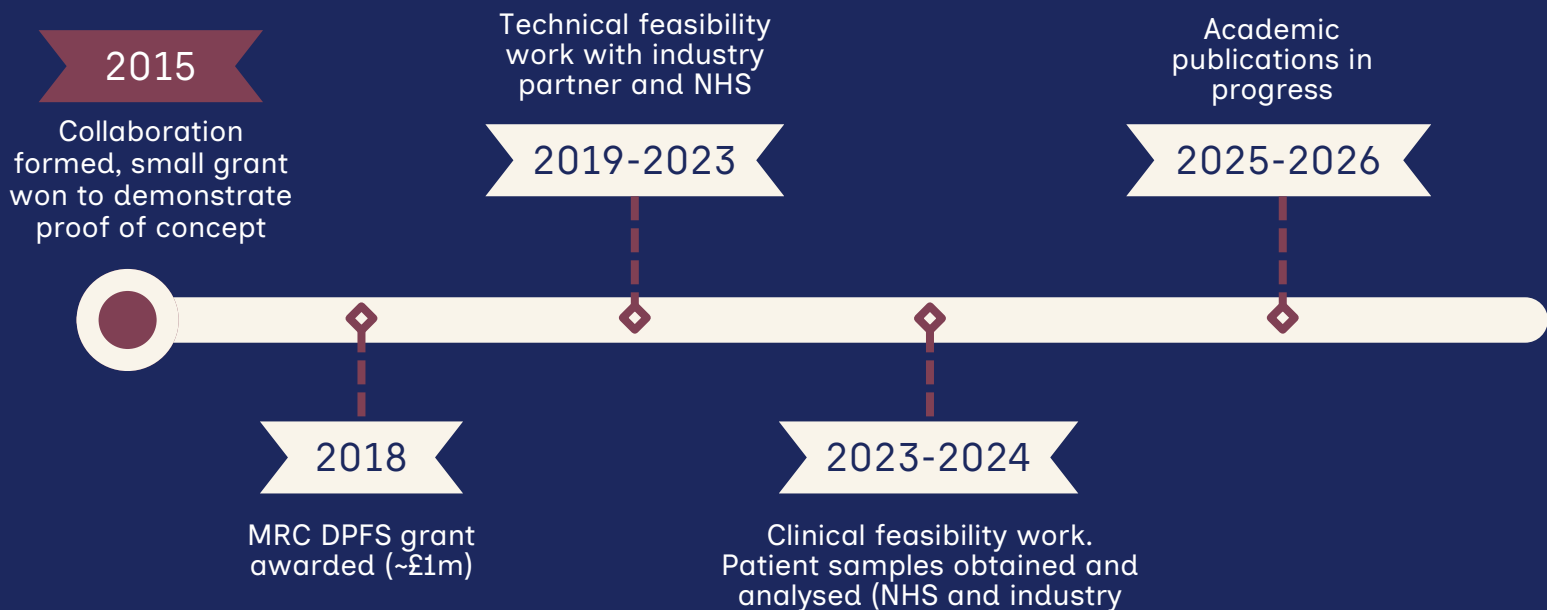
NIHR Support

Support from the National Institute for Health and Care Research (NIHR) Yorkshire and Humber Patient Safety Research Collaboration (YH PSRC) was critical in ensuring that the needs of NHS staff and patients remained front and centre throughout the technology's development.

The expertise of the researchers was fundamental to the success of the collaboration – they provided essential project management (including research approvals), which required frequent and ongoing engagement between the NHS, academics, and industry at every stage. They were also crucial in gathering feedback from users (staff and patients) and liaising with sites and clinicians.

Outcomes

- Individual NHS researchers benefited from personal development and new researcher roles were created.
- The SME was supported for over three years, safeguarding jobs and potentially opening a new market for their products.
- A trade mark was registered, and potentially valuable IP (software and hardware) was developed.
- Many lessons were learned regarding the future direction of the project and how best to repeat the studies using different technology.



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