Real World Evaluation of the NGPOD device

Improving patient safety – A new technology for Nasogastric tube management

Clinical Need

Nasogastric tube (NGT) management

Nasogastric feeding tubes are used when patients cannot swallow food, liquids, or medication safely. After insertion, national guidance requires that clinicians confirm that the nasogastric tube is correctly placed before each time they are used. The current test that confirms correct placement relies upon obtaining fluid (known as aspirate) from the tube and tested using pH test strips. Testing is vital as an incorrectly placed tube (most common misplacements are curled up inside the upper airway or placed into the main bronchus in the lung) can have immediate and serious consequences including severe injury or death.

The current pH testing regime can be unreliable, time-consuming, and often still requires an X-Ray to confirm pH results. Such testing methods often delay feeding treatment or the ability to give medications in a timely way. There are also well-documented human and technical factors associated with the current confirmation methods, leading to errors, delays, and increased risk.

"...both pH testing and use of X-ray are prone to error..."
"...using pH testing strips is potentially unreliable and its complexity underestimated..."
Quotes from the NHS England, Healthcare Safety Investigation Branch report into nasogastric tube placement (Dec 2020)

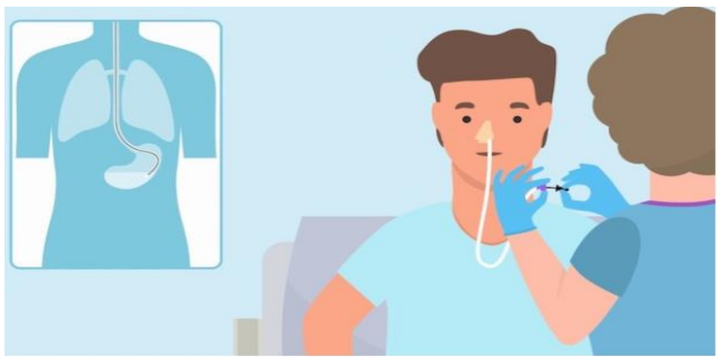

Figure 1: Diagram of an NGT placement (taken from www.NGPODGlobal.com)

The Solution

To address this clinical dilemma NGPOD Global have developed a new device, NGPOD®. The NGPOD® device can be attached to a one-use fibre-optic flexible sensor (coated at the distal end with a hydrophilic pH indicator compound), that can slide down and reach the distal end of the NG tube. The NGPOD® device can then be used to determine the pH of the environment at the end of the NG tube and will indicate whether the pH ≤ 5.5 and that the tube is placed correctly

NHSI asked in 2016, "…what alternative technologies could be explored?" to improve safety in NG tube feeding,
NHS Improvement. Resource set Initial placement checks for nasogastric and orogastric tubes. July 2016

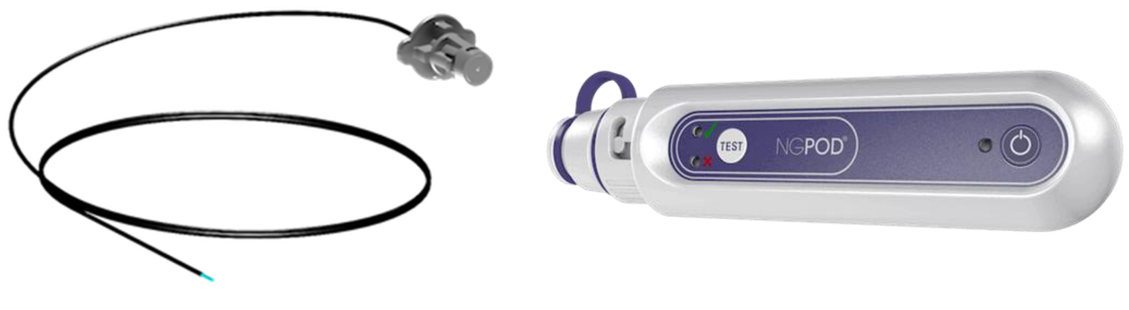

Figure 2: NGPOD is composed of two elements, a fibre-optic sensor (ii) and a hand-held electronic device (iii).

Real World Evaluation

Tritech were commissioned to carry out two real world clinical evaluations on the management of nasogastric feeding tubes on two stroke wards, one at Morriston Hospital, Swansea Bay UHB (Wales, UK) and one at Glangwili Hospital, Hywel Dda UHB (Wales, UK). The evaluation(s) were over a five-month period and assessed the NGPOD device's ability at measuring pH to verify the correct placement of NGT's in patients in real world settings instead of a controlled clinical research study. The evaluation looked at implementation, useability, and clinical impact of the device on the wards.

Findings

21 patients had NGT's placed on the Stroke ward at Morriston Hospital and 8 on the Stroke Ward at Glangwili Hospital. Data was collected on the use of NGPOD, including: pH test results, x-ray requests and delays to feeding/ medication. Staff were engaged through interviews and surveys. Some of the quotes used in the staff reflections can be seen below:

Using the NGPOD just requires a mindset change

they wanted to learn how to use it

'There's a lot to steps to follow and sometimes it was hard to remember them.'

sometimes It was trickier to use than we thought it would be.

If it's used in the right way it's very simple

'….it has prevented x-rays.'

'it's quite straightforward to use.

need an in-depth training program

It's certainly a lot less invasive …

I don't think it would take much to keep people's skills up

It was very quick to use if you know what your doing

The main findings of the evaluation have been divided into three key themes, *Technology, Infrastructure & People* and these are summarised below:

The Technology Evaluation **We found that the technology worked well; it was accurate with no errors and when used appropriately the technology was safe and effective. We did find several cases of the technology not being used correctly through human error.**

The Infrastructure Evaluation **The main barriers found were around the current infrastructure at both sites, including: lack of time, difficulties in finding the key people to talk to, difficulties in sign-off, variability on service design and service oversight/management.**

Staff Evaluation (People) **Feedback around the device was predominately positive, however, they still advocated for pH strips to remain as a back-up or alternative method. The main recurring barriers were the perceived lack of understanding and a need for more training and experience.**

Conclusion

NGPOD was found to be effective when using the device for the intended purpose and using it as per the manufacturer's specified conditions and instructions for use. It takes as long as standard aspirate testing and reduces the need for x-rays in a real-world setting. The evaluation indicated that despite the effectiveness of the technology more structure and support was needed around the implementation of the device. This includes leadership and ownership of the device within the hospital and the development of a competency-based training program within the health board that includes education in its use and mode of operation.

Key recommendations

The evaluation identified several key recommendations:

Recommendation 1: Training. **More contact, guidance and oversight following the initial training would be needed to implement and scale NGPOD in the real world. We strongly recommend a focused strategy on more intensive training, including competency-based assessments and regular refresher training based on the ward.**

Recommendation 2: Dedicated Training/Technology Champions. **As part of the training program, we recommend that the health board / trust appoint a specialist point of contact for staff within the Health Board (or on the ward) who can act as a 'champion' or super trainer**

Recommendation 3: Environment and Accountability. **focused support is required from management and senior team leaders in the health board and on the ward.**

Recommendation 4: Wider Adoption. **it is recommended that the device is adopted across all wards at a hospital (or across an entire health board). This will ensure that more people are aware and comfortable with using the device and will ensure better use of resources.**

The full evaluation report can be found at https://tritech.nhs.wales/evaluation-reports/

Tritech Institute, Unit 2,
Dura Park, Bynea SA14 9TD
Email: Tritech.HDD@wales.nhs.uk

@TriTech Institute
@tritech_hd
http://tritech.nhs.wales