

A Trial of the DoubleCHEK Device to Enhance Nasogastric Tube Practice at the Royal Berkshire Hospital and Reduce the Volume of Chest X-rays

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Introduction: - In the year 2019, 44.9 million imaging tests were reported in England (NHSE, 2019). The figures are continuing to rise each year due to increasing demand. Of these, 2.1 million were chest x-rays. At the Royal Berkshire Hospital NHS Foundation Trust, 3,033 in-patient chest x-rays were reported for checking placement of nasogastric tubes (NGTs) in 2023, and over 300 x-rays had to be repeated for patients due to insertion into the lungs. Inserting NGTs is a common clinical procedure carried out by doctors and nurses daily (Yardley and Donaldson, 2010). Failure to detect misplacement and use of NGTs in the respiratory tract prior to commencement of feeding or administration of medication can be fatal and has been classified as a 'Never Event' (NE) by NHS England (NHSE, 2016). At RBH we have had over 3 never events recorded over the years.

- Aim :**
- Improve patient safety and prevent feeding into the lungs (Never Event).
 - Reduce the volume of chest x-rays for NG tube placement.
 - Save costs i.e. costs of chest x-rays and staff time to transfer and reading x-rays.
 - Prevent delays in treatment i.e. enteral nutrition and medication administration.

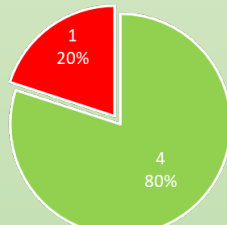
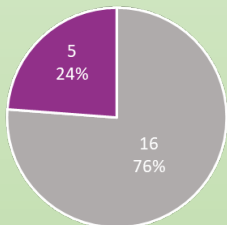


Method: DoubleCHEK™ is designed to aid clinicians when inserting NGTs at the bedside - with both a CO₂ indicator and pH indicator integrated into one, simple to use device, clinicians are able to avoid the airway and confirm placement in the stomach. Over a period of two weeks a trial of DoubleCHEK™ was carried out on our stroke ward.

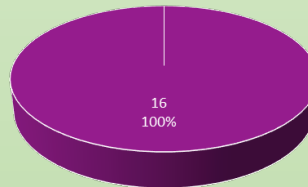
- 3,033 NG tube x-rays in 2023 at £69 ≈ £209,000
- 998 exams reported after hours (£69 + £5.75 for reporting) ≈ £75,000
- Total costs of x-rays ≈ £284,000

Results:

How Was DoubleCHEK Used? CO₂ Indication @ Sternal Notch

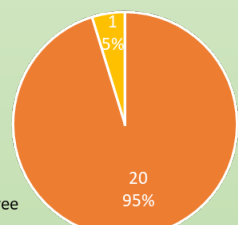


pH Correlation
DoubleCHEK vs. Strip



I Would Use DoubleCHEK in My Practice

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree



□ In-situ pH Check □ Insertion □ CO₂ Not Detected □ CO₂ Detected □ Correlation □ No Correlation □ Equivocal

100% Strongly Agree or Agree

Conclusion/Recommendations:

1. Avoidance of airway NGT misplacements will reduce patient harm and the costs associated with complications (Never Event, pneumothorax, pneumonia) arising from lung placements.
2. Reduced delays in the administration of vital medications and nutritional feeds, which will ensure patients meet targeted nutrition goals and receive required medications within appropriate time windows.
3. Reduced the use of x-rays to confirm NGT placement, which will result in less patient exposure to x-ray, a reduction in x-ray costs, and a reduction in complications resulting from patient transport.
4. The addition of the device will have minimal impact on our current NGT insertion protocol and would just involve an additional step/addendum.
5. DoubleCHEK demonstrated cost savings i.e. £19 per device versus the need and cost of an x-ray (£69 – includes cost of staff and reporting).

Staff Feedback:

- "I hope this comes into practice soon it is a really good innovation"
- "This is actually good because the CO₂ indication confirms that we are definitely not in the airway"
- "Easy to use, much easier to obtain aspirate"

References:

- NHS England, (2019). Diagnostic Imaging Dataset Annual Statistical Release 2019/2020. NHS England and NHS Improvement. <https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2020/10/Annual-Statistical-Release-2019-20-PDF-1.4MB.pdf>
- National Health Service England (2016). National Patient Safety Agency Alert: NHS/PSA/RE/2016/006 <https://www.england.nhs.uk/wp-content/uploads/2019/12/Patient-Safety-Alert-Stage-2-NG-tube-resource-set.pdf>
- Yardley, I. and Donaldson, L. (2010). Patient safety matters: reducing the risk of nasogastric tubes. *Clinical Medicine*. 10(3): 228-2230.