

Enhancing nasogastric (NGT) safety and efficiency with use of CO2 and pH prevents airway misplacements, reduces delays in tube usage and avoids x-ray exposure and costs



Hull University
Teaching Hospitals
NHS Trust

P. MacElhinney-West¹, T. Kaltenbrun², A. Middleton³,
Hull University Teaching Hospitals NHS Trust, Hull, United Kingdom



Introduction

Vast amounts of literature has been written over the years surrounding NGT safety with little evidence of improvements in safety and the reduction in never events. "Misplacement and use of nasogastric feeding tubes leads to ongoing avoidable complications and deaths classified as never events despite the multiple NHS alerts since 2005"¹ despite current guidelines which also do not prevent pneumothoraces before pH testing or x-ray. In 2017 our Trust became a safety improvement development site for NGT placement with concomitant reduction in use of x-rays and avoidance of delays in commencing enteral nutrition and medication via the tubes.

Aim

We reviewed DoubleCHEK™ (Enteral Access Technologies, Liverpool, UK) an alternative safety system for the detection of NGT misplacement before full NGT insertion.

Method

A 2 year retrospective audit identified 5,452 x-rays were performed to confirm NGT placement (2019-20: n=2814; 2020-21: n=2638) at a cost of £373,462. This data suggested significant cost savings could have been applied using DoubleCHEK™ to identify misplacement before full insertion and use (2019-20: £86,774, 2020-21: £118,255).

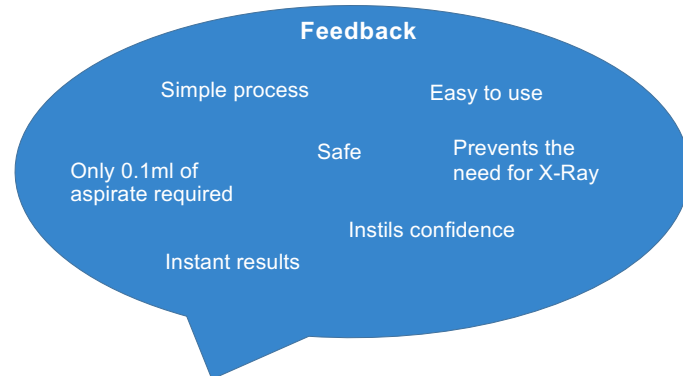
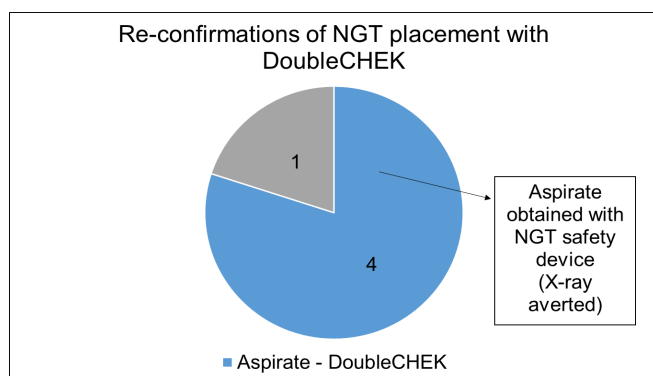
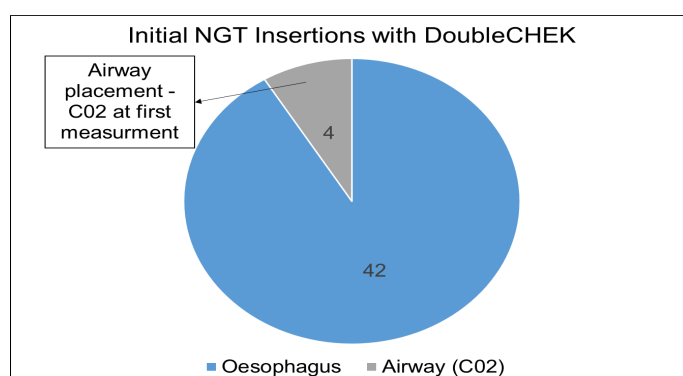
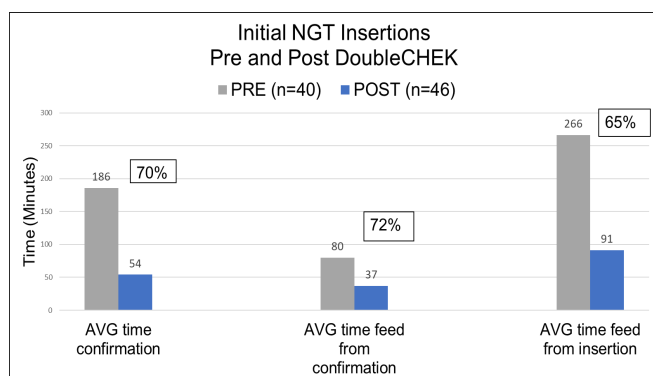
A business case for the introduction of the device was accepted by the Trust together with the need for pre and post implementation data collection.

Pre safety device implementation data (from NGT confirmation to administration of feeds compared to pre implementation data. The overall time from insertion to administration of enteral feed was also reduced by 65%. n=40) was collected in one ward area using the traditional first line pH testing method.

Post implementation data (n=46) using the safety device DoubleCHEK™ led to detection of CO2 at sternal notch at initial NGT insertion and prior to full insertion or usage in (n=4) (10%) thereby avoiding 4 misplacements.

The post implementation data (n=46) demonstrated a 70% reduction in the time to confirm NGT placement and a 72% reduction in the delay to enteral feeding from confirmation. In addition re-confirmations using DoubleCHEK when unable to obtain an aspirate using the traditional method of pH testing (n=4) further x-rays were prevented.

DoubleCHEK™ Results



Conclusion

Improving and enhancing patient safety remains a persistent challenge. Combined testing methods are demonstrated to be safer & more efficient. Since intrapulmonary misplacement is excluded by this technique and pH can be assessed on very small volumes of aspirate, the requirement for x-rays can be greatly reduced with less delays to treatment. As suggested the use of DoubleCHEK can prevent the need for repeated x-ray exposure, increased expenditure, preventing delays in enteral feeding leading to enhanced treatment delivery and reducing the overall patient length of stay. This data suggests that use of DoubleCHEK™ to detect intrapulmonary misplacements prior to full insertion could revolutionize NGT care.

References

¹ Jones, B. A position paper on nasogastric tube safety. British Association of Parenteral and Enteral Nutrition. (BAPEN) 2020