NHS
Health Education England

Nasogastric Tube Insertion Measurement

by Gemma Peacock and Tori Morley

Background

Feeding via nasogastric/orogastric tube (NGT/OGT) in a neonatal unit is a common practice; many babies are fed safely by this method on a daily basis. However, despite this, serious harm can occur if a tube is misplaced and increased morbidity and sometimes death are associated with the use of NGT. The accuracy of different methods of measuring the required length to insert a NGT was explored in recent research studies. The most common methods of measurement are the direct distance from nose to earlobe to xiphisternum (NEX), measuring from the nose to the earlobe to a point halfway between the xiphisternum and the umbilicus (NEMU), an age related height based (ARHB) equation and a weight based method. It became apparent following a teaching session and discussion about measurement for correct placement of NGT that there was no clear consensus on the correct measuring technique.

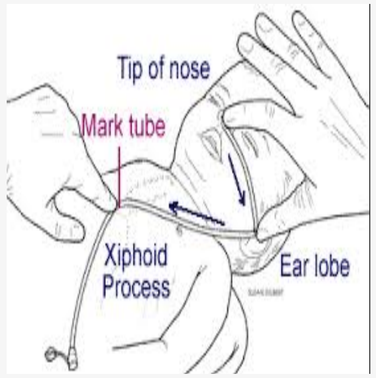
Aims

We aim to ensure that the method used to calculate the length to insert a NGT for a neonate is based upon the best available evidence and that staff are complying with this guidance. The fundamental purpose of this project is to gain consensus to enable the production of a standardised network guideline to improve patient safety within the neonatal unit.

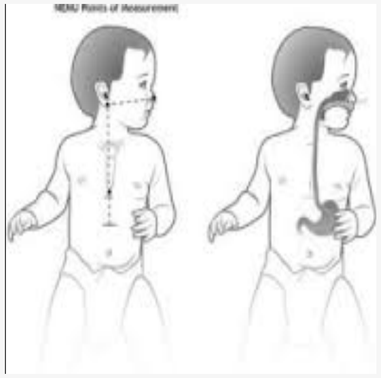
Methods

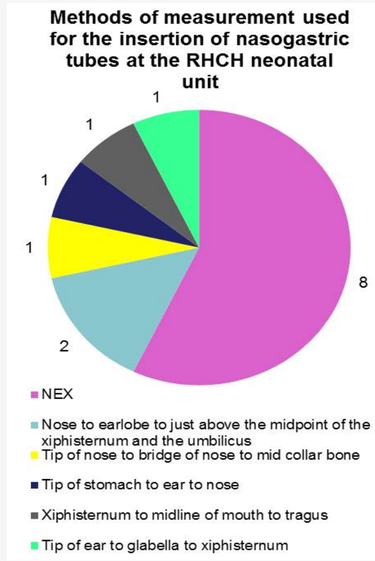
- Review of the literature to find the most commonly used methods for NGT insertion in neonates
- Audit of the current methods used by staff at Oxford University Hospitals (OUH) and the Royal Hampshire County Hospital (RHCH) for insertion of NGT
- Audit of whether staff had heard of other methods of NGT insertion and if they would change their practice if another method improved patient safety
- We identified that to audit effectively we would need to ask at least ten to twenty staff of different grades from each unit.

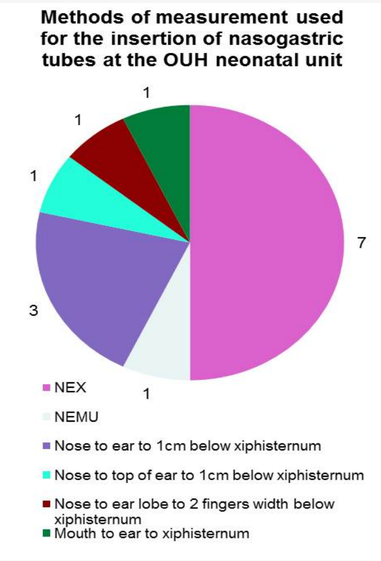
Nose to ear to xiphisternum (NEX)



Nose to earlobe to just above the midpoint of the xiphisternum and umbilicus (NEMU)







Results

At each hospital 14 staff completed the audit, giving 28 findings between both sites. Seven people did not respond to any of the questions, giving an 80% response rate. Only 57% of people who answered the first question responded to the second and third questions of the audit

Upon analysis of the questionnaires a total of 10 different methods were used for measuring the distance required to insert a NGT

Fifty-four percent of staff used the NEX method

Ten percent of staff measured from the nose to the ear to 1cm below the xiphisternum

Seven percent of staff measured from the nose to the earlobe to just above the midpoint of the xiphisternum and the umbilicus (NEMU). The remaining seven methods were each used only once

Out of the 16 people who responded to the second question, only two people had heard of any other method of insertion. One of these people could not remember the other methods but knew that there were some. The other person used the NEX method however, had heard of the NEMU method and measuring backwards from the xiphisternum to the earlobe to the nose

All of the 16 people who responded to the third question said that they would be happy to use another method of measurement if it were based upon the best available evidence.

Conclusion

Insertion of NGT is frequently required for babies in a neonatal unit. This project has highlighted a discrepancy in methods used in two neonatal units to measure the distance to insert a NGT. Current evidence suggests that the NEX method of measurement should not be used for neonates, however the majority of staff who completed the questionnaire still use this method. There are many risks associated with misplaced NGT and despite the use of pH testing to ensure the NGT is correctly inserted in the stomach, knowing the required distance to insert an NGT can prevent harm to the patient.

The next stage of this process is to present the data analysis and results in an academic poster. This will then be presented to the network lead nurses to gain consensus to enable the production of a standardised network guideline.

Process of Implementing Change

To successfully implement the change in practice it is imperative to communicate at strategic, operational and individual levels. A secure email will be sent out to all clinical staff on the unit, informing them of the change. Training will be provided and staff will have a theoretical explanation detailing the benefits and risks involved before being shown the technique. Supervised practice, unsupervised practice and reflection will be completed before staff are deemed competent. The practice educators will then provide the opportunity for staff members to solicit concerns, questions, clarifications, and suggestions. Feedback and positive reinforcement will follow, as well as challenging any barriers to change.

The new method of insertion will be updated on both staff intranet and in the policies book. The main goal of this patient safety project is to gain consensus to enable the production of a standardised network guideline.

References

Chen Y.C., Wang L.Y., Chang Y.J., Yang C.P., Wu T.J., Lin F.R., Liu S.Y. and Wei T.S. (2014) Potential risk of malposition of nasogastric tube using nose-ear-xiphoid measurement. PLoS One. [Online] 9(2) [Accessed 15 May 2016] Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3919749/

Cirgin Ellett M.L., Cohen M.D., Perkins S.M., Smith C.E., Lane K.A. and Austin J.K. (2011) Predicting the Insertion Length for Gastric Tube Placement in Neonates. Journal of Obstetric, Gynecologic & Neonatal Nursing 40(4): 412-421

Clifford, P., Heimall, L., Brittingham, L. and Finn Davis, K. (2015) Following the Evidence: Enteral Tube Placement and Verification in Neonates and Young Children. Journal of Perinatal and Neonatal Nursing. [Online] 29(2): pp. 149-161 [Accessed 12 July 2016]. Available from: http://www.nursingcenter.com/cearticle?an=00005237-201504000-00013&Journal_ID=54008&Issue_ID=3099787

Freeman D., Saxton V. and Holberton J. (2012) A weight-based formula for the estimation of gastric tube insertion length in newborns. Advances in Neonatal Care 12(3): 179-182

Great Ormond Street Hospital (GOSH) Nasogastric and orogastric tube management [Online]. [Accessed 15 May 2016] Available from: http://www.gosh.nhs.uk/health-professionals/clinical-guidelines/nasogastric-and-orogastric-tube-management

Lewin K. (1951) Force Theory in Social Science. New York, NY: Harper and Row

National Patient Safety Agency (NSPA) (2005) Patient Safety Alert NPSA/2005/PSA09 Reducing the harm caused by misplaced naso and orogastric feeding tubes in babies under the care of neonatal unit. [Online] [Accessed 15 May 2016]. Available from: http://www.nrls.npsa.nhs.uk/resources/?EntryId45=59794

National Patient Safety Agency (NSPA) (2011) Patient Safety Alert NPSA/2011/PSA002 Reducing the harm caused by misplaced nasogastric feeding tubes in adults, children and infants. [Online] [Accessed 15 May 2016]. Available from: http://www.nrls.npsa.nhs.uk/EasySiteWeb/getresource.axd?AssetID=129697&

Nguyen S., Fang A., Saxton V. and Holberton J. (2016) Accuracy of a Weight-Based Formula for Neonatal Gastric Tube Insertion Length Advances in Neonatal Care 16(2): 158-161

Nottingham Neonatal Service (2012) Passing a Nasogastric Tube/ Orogastric Tube Feeding [G12] [Online] Nottingham: Nottingham University Hospitals NHS Trust. [Accessed 10 May 2016] Available from: https://www.nuh.nhs.uk/handlers/downloads.ashx?id=42828

Portsmouth Hospitals NHS Trust Neonatal Intensive Care Guidelines; Insertion and maintenance of Naso-gastric tubes 18/08/2011

Saddleback College (2016) Nasogastric Tube Insertion [Accessed date 10 July 2016]. [Online] Available from: https://alfa.saddleback.edu/data/nasogastric-tube-insertion

Stephenson J. (2012) Passing a Nasogastric Tube /Orogastric Tube Feeding. [Accessed date 10 May 2016]. [Online] Available from: https://www.nuh.nhs.uk/handlers/downloads.ashx?id=42828

Taylor S.J., Allan K., McWilliam H. and Toher D. (2014) Nasogastric tube depth: the 'NEX' guideline is incorrect. British Journal of Nursing. [Online] 23(12): pp. 1-4 [Accessed 18 May 2016]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/25039627

Quandt D., Schraner T., Bucher H.U. and Mieth R.A. (2009) Malposition of Feeding Tubes in Neonates: Is it an Issue? J Pediatric Gastroenterology and Nutrition. 48: 608-611.