

Does Evidence Change Practice? A Five Year Follow-up Study on NGT Verification in Pediatrics

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OBJECTIVES

- Describe the mission of the NOVEL project
- Discuss findings from the 2015 and 2016 studies
- Discuss findings from the 2022 study



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So, what was the issue?

- The morbidity and mortality rates from misplaced NGT's in adult and pediatric populations
- Lack of literature consistency on the most appropriate method for check for tube placement
 - *Pediatric literature was even more limited than adult*
- American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) (2009) implemented practice recommendations to address the risks and potential complications associated with misplaced NG tubes
- Practice alert issued by American Association of Critical Care Nurses in 2010 and in 2012 by the Child Health Patient Safety Organization issued a statement recommending immediate discontinuation of the auscultation method for the assessment/verification of nasogastric (NG) tube placement



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NOVEL

- To address these issues, the NOVEL group was formed (initiated by ASPEN)
- NOVEL
 - *New Opportunities for Verification of Enteral tube Location*
- The NOVEL project is a multi-professional, collaborative approach to address the challenges associated with insertion and ongoing verification of nasogastric enteral access devices (NG-EAD) placement



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NOVEL'S MISSION

- The NOVEL project's missions are to:
 - Determine best practices related to current methods available to verify NG tube placement in pediatric patients
 - Disseminate knowledge to professionals to improve clinical practice as it pertains to NG tube placement verification
 - Work with biomedical engineers and industry to develop non-radiologic method(s) to verify NG tube placement and to allow for re-verification of placement



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2015 HOSPITAL STUDY RESULTS

- Hospitals that care for children were invited to participate in a point in time study to ascertain baseline data:
 - the number of NG/OG tubes used in a day
 - setting for usage
 - methods of verification used
 - **63 TOTAL SITES**
 - Total census from all sites = 8333
 - 39 pediatric facilities
 - 8 adult with newborn
 - 16 adults with pediatrics ad newborn
 - % of patients with a tube when data collected = 23.94%



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- **METHOD 1**
 - Aspiration 21/63 = ~33%
 - Auscultation 18/63 = ~29%*
 - Measurement 8/63 = ~13%
 - pH 10/63 = ~16%
 - *X-ray 6/63 = ~1% (recommended gold standard as initial verification)*
- **METHOD 2**
 - Aspiration - 5/63 = ~.08%
 - Auscultation -20/63 = ~ 32%*
 - Measurement - 4/63 = ~ .06%
 - pH - 5/63 = ~ .08%
 - *X-ray 19/63 = 30%*
- **METHOD 3**
 - Aspiration - 12/63 = ~19%
 - Auscultation - 3/63 = ~ 0.4%
 - Measurement - 9/63 = ~14%
 - pH - 1/63 = ~ 0.1%
 - *X-ray - 13/63 = ~21%*



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More interesting info....

- Pediatric agencies:
 - *Method 1 - aspiration*
 - *Method 2 - x-ray*
 - *Method 3 - measurement*
- Adult hospitals with and NICU
 - *Method 1 - auscultation **
 - *Method 2 - auscultation **
 - *Method 3 - aspiration*
- Adult/Pediatric/Neonatal
 - *Method 1 - aspiration*
 - *Method 2 - auscultation **
 - *Method 3 - x-ray*



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SO WHAT DID THIS TELL US?

- The data validated what is in the literature
- Despite the current recommendations, there was clearly a large variation across the country on tube placement verification
- *Next question: If there was that much variation with the in-patient population, what is done in the homes by caregivers?*
- Literature lacking on data related to children with NG/OG tubes in the home



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- *Of the 144 responses:*
 - 71% of tubes were replaced by the caregiver
 - 14% in a health care setting
 - Others included friends, neighbors, the child
 - 81% were taught the NEMU method for placement check
 - 14% were taught to use the mark on the tube
 - 74% reported having experienced a misplaced tube



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- How did you know the tube was placed incorrectly?
- Responses included:
 - Episodes of vomiting
 - No aspirate
 - X-rays
 - Irritability
 - *Abnormal breathing*
 - *Can't hear air in abdomen*
 - Curled up in his mouth/came out of his mouth
 - *Gaspings for breath, turning blue, coughing, choking*
 - *Couldn't breathe properly /choking/crying and choking*
 - pH paper told me
 - Couldn't flush



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WHAT DID WE LEARN?

- Study was first attempt to gain baseline data
- These findings confirm what the current literature reports - which is inconsistency in practice
- There are no standard guidelines for frequency of tube replacement (routine) in the home setting



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- *In terms of tube verification:*
 - **Caregivers are taught what nurses practice**
- **Auscultation was still being used and subsequently taught to parents**
 - **2 Practice Alerts** have cautioned against this method (AACN (2010), Child Patient Safety Org (2012))
 - pH paper is not used as frequently as auscultation or aspiration
 - While X-ray is the gold standard, studies have indicated pH paper is more reliable than auscultation or viewing aspirate



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WHAT DID WE DO?

- Published the results of the hospital study
- Published the results of the home study
- Presented at national conferences around the country
 - pediatric, critical care, neonatal, safety, nutrition
- Published paper on recommended best practices
- Worked with organizations to champion change



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2021 Follow-up Study Results

- The purpose of this descriptive study was to ascertain the policies and procedures related to nasogastric tube (NGT) placement verification in acute care facilities that care for pediatric and neonatal patients aged up to 18 years of age
- The survey consisted of 15 numbered questions, 4 that require the participant to free-text a response and 10 questions that have open-ended options.
- The survey was distributed to health care professionals in acute care hospitals that provide care to neonates up to 18 year old children



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- The hospitals represented:
 - Combined adult/pediatric/neonatal facilities (N=122)
 - Free standing pediatric institutions (N=77)
 - NICU units in an adult institution (N=3)
 - Other facilities: rehabilitation centers (N=4)
 - Not all 245 respondents answered this question (N=39)
 - The 206 responses represented 200 institutions
- Twenty three of the 63 original institutions from the 2015 study participated in the follow up survey



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- The current study asked a question regarding the participants' *understanding* of best practice:
 - 64% indicated radiographic placement
 - 24% indicated pH measurement
- When asked what method was actually used on their unit:
 - over 40% of respondents selected measurement of pH aspirate
 - Slightly more than 20% relied on radiography



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- Identified barriers within an institution to using pH or a radiograph were identified:
 - radiation exposure (N=86)
 - cost (N=53)
 - challenges associated with point of care testing (N=51)
 - *no need to change current practice (N=31)*
 - *current policies do not support these methods (N=18)*



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- In the 'other' category, these themes were noted:
 - accuracy of pH measurement
 - feasibility of use in some settings (home)
 - lack of available supplies
 - staff to be tested for color blindness
 - reluctance to change a long-standing practice



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SO...LESSONS...

- Despite these warnings and practice alerts, *methods still varied widely* by nurses caring for pediatric patients
- *Findings indicated a slight decrease of 6% in the use of auscultation alone.* This may suggest a shift in practice to more evidence-based confirmation methods
- Forty-six percent of respondents *did not know* why a policy change was made within their institution



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- Frequently, NICUs were singled out as having different verification techniques than other areas in the hospital
 - *The mark and measure, aspiration and visualization or auscultation* were more frequently seen in NICU settings than in other areas of the pediatric hospitals where pH and radiographic verification techniques were more common



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- The work by the NOVEL group was noted to influence practice change by **9.7 %** of respondents
 - Reading articles and attending conferences was also listed as influences
- A standardized practice is greatly needed and long overdue
 - Identified barriers and problem solving these are warranted
- Ways to address the ‘*no need to change practice*’ and ‘*current policies do not support these methods*’ mindset
- Ongoing research and EBP projects to support the needed change



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