Practice Change for Patients with Nasogastric/Orogastric Enteral Tubes: Safety Improvement Initiative

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Penn Nursing Science

DISCLOSURES

- No conflicts of interest

PERSPECTIVE

- How many have ever placed a temporary EAD in a pediatric patient?
- Did you ever experience ‘doubt’ in the location / placement of the tube?
- What method(s) did you use to verify placement?
- Have you ever had an adverse event directly related to placement of an NG/OG tube?

PURPOSE

- Educate multidisciplinary patient care staff to risks associated with blind/bedside NG/OG tube insertion
- Revise practice to align with current best evidence
- Desire for increased patient safety with the placement and ongoing location verification of NG/OG tubes

BACKGROUND

- Safety alerts highlighting the risks associated with blind/bedside insertion of NG/OG tubes
- Safety events requiring ICU admission
- Review of current practice and policy
- Alignment (or lack of) with current literature

BACKGROUND

Issued in 2010

AACN PRACTICE ALERT

VERIFICATION OF FEEDING TUBE PLACEMENT
(blindly inserted)

Expected Practice:

☑ Use a variety of bedside methods to predict tube location ***during*** the insertion procedure:

"…often considered an innocuous procedure, blind placement of a feeding tube can cause serious and even fatal complications…"

Recommendations:

1 – Use variety of bedside methods

2 – Obtain radiograph of any blindly inserted tube prior to its initial use for feedings or medication administration

3 – Check location at 4 hour intervals

BACKGROUND

Issued in 2012

Child Health
Patient Safety Organization

SAFETY ALERT

Blind Pediatric NG Tube Placements – Continue to Cause Harm

This information is brought to you from Child Health PSO and ECRI Institute research.

Child Health PSO identified an immediate need for pediatric providers to consider the risks associated with blind NG Tube placement and recommendations to prevent harm as this is the most common method of insertion of nasogastric (NG) tubes is blind passage. In 2011, the United Kingdom's National Patient

Bankhead et al (2009)
A.S.P.E.N. Enteral Nutrition Practice Recommendations
- Bedside methods serve as precursor to radiograph confirmation
- Gold standard for confirming correct placement of blindly placed tube is radiograph that visualizes entire course of the tube

Sorokin et al (2006)
1.3 to 2.4% of 2000 NG tubes mal-positioned (raw numbers: 260-480)
28% resulted in pneumonia or pneumothorax
2 deaths of directly related to NG tube misplacement

ACTION NEEDED:

1. ***Immediately Discontinue***
   - Insertion of an air bolus with auscultation over the abdomen to assess/verify NG tube placement
2. ***Consider Discontinuing***
   - Nose-ear-xiphoid (NEX) as a predictor of NG tube insertion-length
3. **Consider x-ray verification when indicated (e.g. high-risk situations, difficult placement, when other non-radiologic methods are not confirmatory)**

BACKGROUND

National Health Service, UK
(formerly National Patient Safety Agency)

2005

Reducing harm caused by misplaced nasogastric feeding tubes
11 deaths and one case of serious harm due to misplaced nasogastric feeding tubes over a two-year period.
"…studies have shown that conventional methods used to check the placement of nasogastric feeding tubes can be inaccurate."

2011

"Never Event": **Harm from flushing of nasogastric tubes before confirmation of placement**

http://www.nrls.npsa.nhs.uk/resources/type/alerts/?entryid45=133441

PRACTICE CHANGE

- Literature review – inconsistent identification of "best practice" and "best" method for location verification

Special Report

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Enteral Nutrition Practice Recommendations

Enteral Nutrition Practice Recommendations Task Force: Robin Bankhead, CRNP, MS, CNSN, Chair; Joseph Boullata, PharmD, BCNSP; Susan Brantley, MS, RD, LDN, CNSD; Mark Corkins, MD, CNSP; Peggi Guenter, PhD, RN, CNSN; Joseph Krenitsky, MS, RD; Beth Lyman, RN, MSN; Norma A. Metheny, PhD, RN, FAAN; Charles Mueller, PhD, RD, CNSD; Sandra Robbins, RD, CSP, LD; Jacqueline Wessel, MEd, RD, CSP, CNSD, CLE; and the A.S.P.E.N. Board of Directors.

"…The gold standard for confirming correct placement of a blindly inserted enteral access device is a properly obtained and interpreted radiograph that visualizes the entire course of the tube…"

Challenges associated:

- Multiple radiographs/day
- Radiation exposure
- Variability in interpretation and reading

PRACTICE CHANGE

- Abdominal radiograph – “gold standard”

Special Report

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Nasogastric Tube Placement and Verification in Children: Review of the Current Literature

Sharon Y. Irving, RN, PhD, CRNP[1]; Beth Lyman, RN, MSN, CNSC[2]; LaDonna Northington, RN, DNS[3]; Jacqueline A. Bartlett, RN, PhD[2]; Carol Kemper, RN, PhD, CPHQ[2]; and NOVEL Project Work Group

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Nasogastric Tube Placement Verification In Pediatric and Neonatal Patients

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Sheryl Lang
Laura Cullen
Stephanie Stewart

PRACTICE CHANGE

Original Communication

Journal of Parenteral and Enteral Nutrition
Volume 35 Number 4
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Determination of a Practical pH Cutoff Level for Reliable Confirmation of Nasogastric Tube Placement

Heather Ruth Gilbertson, PhD[1,2]; Elizabeth Jessie Rogers, MND[1]; and Obioha Chukwunyere Ukoumunne, PhD[2,3]

Financial disclosure: This study was funded by a grant (CT 7265) from Felton Bequest and funds from Nutricia.

- Commonly used
- No consensus on which pH value is indicative of correct placement
- If used independent of other methods is not always reliable
- ? interpretation in the presence of acid-inhibiting medications

PRACTICE CHANGE

- Benchmark

Cincinnati Children's Hospital Medical Center

Patient Services/NGT/OGT Placement/Confirmation/BESt 024

Best Evidence Statement (BESt)

Date: August 22, 2011

Introductory/background information

Error rates for placement of enteral tubes in any location, other than the intended location, can be up to 43.5% in pediatric settings (Ellett, 1999). A small percentage of enteral tubes, reported as 1%-4% in adult intensive care settings but unknown in pediatrics, are incorrectly placed within the respiratory tract with potentially serious consequences (Ellett, 2005, Metheny, 1999b, Metheny, 1994a). Children who are comatose, semi-comatose, or have

Recommendations (See Table of Recommendation Strength following references)

1. It is recommended that radiologic verification be used to determine NGT/OGT placement in pediatric patients who are at high risk of aspiration or when non-radiologic methods are not feasible, or results are unclear.

Note: Pediatric patients at risk for incorrect tube placement include those who have neurologic impairment and other conditions which may increase the difficulty of safe, effective tube placement and include patients who are obtunded, sedated, unconscious, critically ill and those with reduced gag reflex or static encephalopathy (Metheny, 1994a [3a], Phang 2004 [3b], Ellett 1999 [4b]).

Note: Radiologic verification is considered the gold standard but may contribute to higher costs, decreased convenience, and increased radiation exposure (Metheny 1994a [3a], Metheny2002 [3a], Nyqvist 2005 [4a], Peter 2008 [4a], Ellett 1999 [4b], Westhus 2004 [4b]).

PRACTICE CHANGE

Stakeholder Buy-In

- Patient Care and Safety Officers
- Executive Nursing/Medical Leadership
- Nursing Council
- EPIC Leadership
- Practice Groups
  - Critical Care (includes cardiac)
  - General Pediatrics
  - Neurology
  - NICU
  - Pulmonary
  - Rehabilitation Medicine

PRACTICE CHANGE

Better defined identification of high risk patients

Caution:

Patients in whom changes in clinical condition may make it difficult to assess for NG/OG tube misplacement include but are not limited to:

- Patients who are critically ill
- Patients with decreased or absent gag or cough reflex (e.g. neurologically impaired, sedated or chemically paralyzed)
- Patients with respiratory disease (e.g. persistent cough, require mechanical ventilation)
- **Patients with a history of difficult NG/OG tube placement AND/OR history of misplaced NG/OG tube (e.g. certain facial or airway abnormalities)**

Recommendation for radiograph confirmation

- Radiograph request for tube course and tube tip location

EPIC Orders

- Revisions to NG/OG tube placement order set to reflect changes in practice

PRACTICE CHANGE

Accept

Feeding Tube

If you are ordering a Nasogastric Tube, the POC Gastric pH is required. Otherwise you can deselect the POC order. If you are unsure whether the decision tree suggests that your patient is high-risk and should get a chest x-ray, see NG/OG tube placement job aid:

JOB AID: Decision Tree for Confirming NG/OG Tube Placement

☑ **Nasogastric Tube**

Type: Nasogastric Tube

☑ **POC Gastric PH**

Point of Care, Routine, AS INSTRUCTED (SEE COMMENTS) starting Today at 1449 Until Specified, Gastric Aspirate, to confirm NG Tube placement

☑ **Continuous Pulse Oximetry**

Schedule: Monitor until naso-enteral or oral-enteral tube tip location is verified
Indications: Monitoring during initial insertion of naso-enteral or oral-enteral tube
Pulse Oximetry High (%): 101
Pulse Oximetry Low (%): 90
until naso-enteral or oral-enteral tube tip location is verified

☐ XR CHEST 1VW AP OR PA

Next Required

Accept

PRACTICE CHANGE

Pulse oximetry

- Prior to, during and following NG/OG tube insertion until tube tip location is confirmed
- Document baseline and ending pulse oximetry reading in EPIC

Tube Depth Measurement

- Use **N**ose-**E**arlobe-**M**id**U**mbilical (NEMU) span for NG tube depth placement
- Use center of lower lip-earlobe-midumbilical span for OG tube

Tube markings

- Document centimeter marking at nasal/oral exit in EPIC
- Confirm centimeter marking is unchanged when confirming tube placement location

Patient Assessment

- Assess and document any changes in patient's clinical status during and following tube placement

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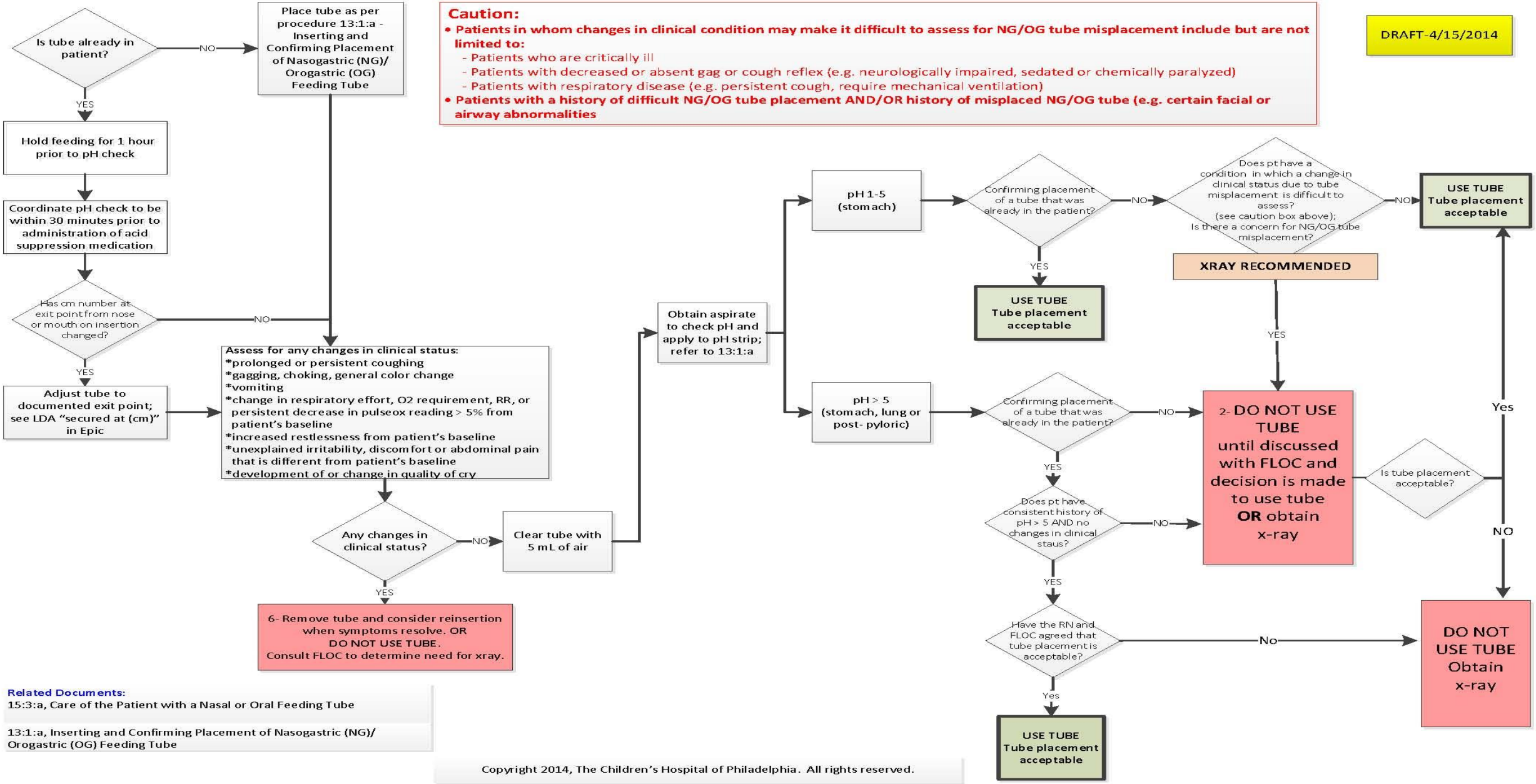
JOB AID: Decision Tree for Confirming NG/OG Tube Placement

Effective Date: XX-XX-XXXX

DRAFT-4/15/2014

Caution:

- **Patients in whom changes in clinical condition may make it difficult to assess for NG/OG tube misplacement include but are not limited to:**
  - Patients who are critically ill
  - Patients with decreased or absent gag or cough reflex (e.g. neurologically impaired, sedated or chemically paralyzed)
  - Patients with respiratory disease (e.g. persistent cough, require mechanical ventilation)
- **Patients with a history of difficult NG/OG tube placement AND/OR history of misplaced NG/OG tube (e.g. certain facial or airway abnormalities**



Related Documents:

15:3:a, Care of the Patient with a Nasal or Oral Feeding Tube

13:1:a, Inserting and Confirming Placement of Nasogastric (NG)/ Orogastric (OG) Feeding Tube

PRACTICE CHANGE

Radiographic Confirmation (recommended)

- If change(s) in patient status is difficult to assess
- Any concern with NG/OG tube placement

Should the decision be made ***NOT*** to obtain a radiograph to confirm NG/OG placement in a high risk patient

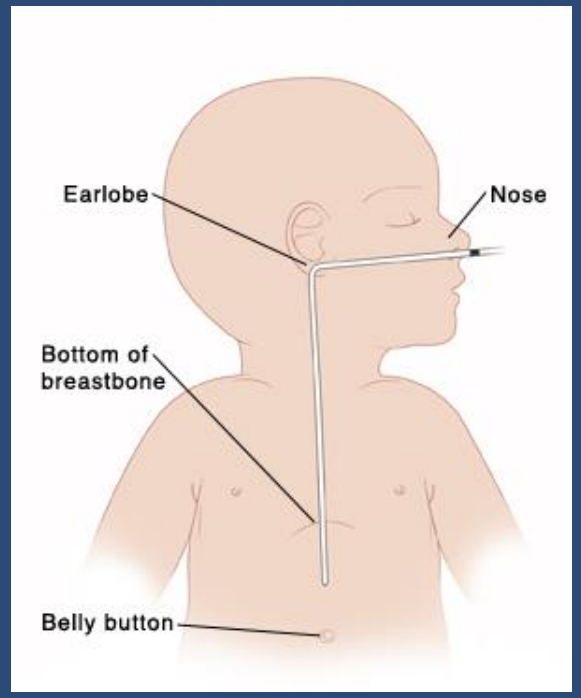
- ***BOTH*** the RN and provider must be in agreement for tube location and tube use
- Documentation from RN and provider to reflect decision and patient status

PRACTICE CHANGE

Nursing practice - Insertion

- Use of pulse oximetry on those patients who are not on continuous monitoring, establish baseline reading
- Use of NEMU method to determine tube depth
- Outline of changes in patient status that may reflect misplaced tube upon insertion
  - Prolonged/persistent cough
  - Gagging/choking
  - Change in respiratory effort, rate, oxygen requirement, decrease in pulse oximetry >5% from baseline
  - Change in quality of cry

NEMU Method



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PRACTICE CHANGE

Nursing Practice - Ongoing location verification

- Acid-blocking medications
  - Check gastric pH 30 – 60 minutes prior to medication administration
- Continuous enteral feeding
  - Hold feed once per 24hrs for minimum of 1 hour and check gastric pH
- Intermittent feeds and medications, check gastric pH prior to use
  - Consider if patient has history of increased pH
- Document exit point cm mark in the EHR any time tube is used

COMMITTEE MEMBERS

- Jackie Crawford, MS, CNS
- Daniela Davis, MD
- Nancy Ford, MSN
- Beth Goldberg, MSN, CPNP
- Sharon Irving, PhD, CRNP
- Anne Mohan, MSN

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