CLINICAL GUIDELINE FOR THE CARE OF A NEONATE, CHILD OR YOUNG PERSON REQUIRING A NASO/OROGASTRIC TUBE

1. Aim/Purpose of this Guideline

This guideline aims to address the issues raised in the NPSA alert 19 and 09 and Patient Safety Alert 20011 PSA 002: Reducing the harm caused by misplaced nasogastric feeding tubes in adults, children and infants. This guideline aims to promote safe practice when passing an oro/nasogastric feeding tube, subsequent usage for feeding and the administration of liquid medicines.

1.1 This guideline applies to all practitioners passing and using a nasogastric or orogastric tube in a neonate, child or young person.

2. The Guidance

2.1 Nasogastric tube feeding is common practice in neonates and child health thousands of feeding tubes are inserted daily without incident.

However, there is a small risk that the enteral feeding tube can be misplaced into the lungs during insertion, or move out of the stomach at a later stage. Although misplacement can be recognised at an early stage, i.e. before the tube is used, studies have shown that conventional methods used to check the placement of nasogastric feeding tubes can be inaccurate.

Naso/ Orogastric tubes are used primarily for the initiation and progression of enteral feeds, but may also be used for gastric decompression.

All staff and carers, caring for neonates and children with a nasogastric tube in place must be trained to assess the position of feeding tubes using pH paper or indicator strips and that training must be competency based.

2.2 Staff and carers must be competent in all aspects of gastric tube management and able to initiate resuscitation if required. Possible complications include:

- Gastric tube misplaced into trachea or oesophagus leading to aspiration and pneumonia.
- Gastro-oesophageal reflux.
- Vasovagal response on passage of tube resulting in apnoea, bradycardia and cyanosis.
- Nasal, pharyngeal and oesophageal trauma.
- Trauma to skin underlying tube fixation device.
- Gastric tube malpositioned following coughing or retching during feed.
2.3 Insertion and care of naso/orogastric tube:

- Identify patient as per RCHT Policy for Patient Identification
- Identify appropriate route e.g. consider orogastric if any respiratory distress or nasal anomalies; nasogastric if no respiratory compromise.
- Wash and dry hands as per RCHT policy at each step of the guideline.
- Assemble equipment:
  1. Select the minimum sized tube which is most effective for the purpose (4Fg – 12Fg).
  2. The gastric tube should be sterile, phthalate free, have graduated markings, be radio-opaque and be oral syringe compatible.
  3. Skin protection suitable for patient e.g. Comfeel, Duoderm, Cavalon
  4. Tape to secure in place.
  5. Oral /enteral syringe to aspirate, minimum 10ml (generates 20 PSI). [N.B. 1ml generates 150 PSI, 3ml generates 120 PSI, 5ml generates 90 PSI].
  6. pH indicator strip
  7. Appropriate personal protective equipment for patient condition e.g. gloves/apron.
  8. Disposal bag.

2.4 Preparation of patient and environment:

- Explain procedure to child family/carer as appropriate.
- Ensure appropriate timing to pass tube; i.e. be aware of risk of vomiting if tube passed midway or immediately following a feed.
- Measure required length of naso-gastric tube e.g. nose to ear to xiphoid process, oro-gastric ,corner of mouth to ear to xiphoid process
- Apply skin protection to nose, cheek or chin if used and prepare securing tape.
- Ensure infant is secure, warm and comfortably positioned. Second health care professional may be required to assist.
- Ensure adequate light.
- Ensure clean surface for equipment.
- Insert un-spigoted tube via mouth or chosen nostril aiming down and back, to the measured length and hold in position. Observe the infant/child for any signs of distress or malposition of tube and initiate corrective measures.
- Test position of tube as per NPSA 09 [2005] algorithm for neonatal and non neonatal patients, (see appendix).If resistance is met when aspirating, stop immediately, disconnect and instil 0.5mL of air to release pressure against stomach wall.
- Secure gastric tube in position and close end if appropriate.
- Comfort and settle infant/child as required.
- Dispose of waste as per RCHT policy.
- Wash and dry hands as per RCHT policy.
2.5 Document:

- Date, time and route including right or left nostril.
- Size and length of gastric tube.
- Ph, volume and description of aspirate including whether discarded or replaced.
- Tolerance of procedure, any corrective measures required and justification of same
- Initiate relevant NG/NO Child Health care plan / feeding chart/ fluid balance chart.

*Follow the manufacturers' recommendations for frequency of change of gastric tube.*

The following methods MUST NOT be used:

- **Auscultation of air insufflated through the feeding tube (‘whoosh’ test)**
  There are many reports on the ineffectiveness of this method. In several cases, results indicated correct tube placement but feeding was started with disastrous results. The auscultation method requires staff to distinguish between air passed through the tube via the oesophagus into the stomach, and air passed via the main bronchus into the lungs; a position not anatomically far from the stomach. There is no evidence to suggest that it is easier or more reliable to differentiate between oesophageal and bronchial insertion in neonates. Experts have repeatedly highlighted the difficulties in using this method.

- **Testing acidity/alkalinity of aspirate using blue litmus paper**
  Universal pH testing paper or strips are recommended for testing the acidity/alkalinity of aspirate, rather than litmus paper. The Medicines and Healthcare products Regulatory Agency (MHRA) distributed this advice to all NHS staff in June 2004. Blue litmus paper is not sensitive enough to distinguish between bronchial and gastric secretions.

- **Interpreting absence of respiratory distress as an indicator of correct positioning**
  Observing for signs of respiratory distress is ineffective in detecting a misplaced tube. Small bore tubes can enter the respiratory tract with few, if any, symptoms and large bore tubes can enter a patient’s respiratory tract without any symptoms being shown, particularly if the patient is unconscious.

- **Monitoring bubbling at the end of the tube**
  Looking for bubbling at the proximal end of the tube is unreliable because the stomach also contains air and could falsely indicate gastric placement.

- **Observing the appearance of feeding tube aspirate**
  Research and anecdotal evidence indicate that relying on the appearance of feeding tube aspirate is unreliable as a primary testing method as gastric contents can look similar to respiratory secretions.
The recommended procedure for checking the position of the naso-and oro-gastric feeding tube in babies under the care of neonatal units.

**Use this flowchart as a basis for decision making**

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Check for signs of tube displacement (if not initial insertion)</strong></td>
<td>The tube may have come up in the mouth or if there is more tube visible than previously documented, the tube may have kinked. Loose tape may indicate movement. If tube has been displaced, it will need repositioning or re-passing before feeding.</td>
</tr>
<tr>
<td><strong>Aspirate 0.2-1ml gastric fluid and allow ten to 15 seconds for any colour change</strong></td>
<td>0.2 to 1ml of aspirate will cover an adequate area on single, double or triple reagent panels of pH testing strips or paper.</td>
</tr>
<tr>
<td><strong>Aspirate using a syringe</strong></td>
<td>It is safe practice to use gastric tubes and enteral syringes that have non-luer lock connectors (Building a Safer NHS for Patients: Improving Medication Safety published 22/01/2004 available at <a href="http://www.dh.gov.uk">www.dh.gov.uk</a>).</td>
</tr>
<tr>
<td><strong>Aspirate is pH 5.5 or below</strong></td>
<td>Aspirates testing pH 5.5 and below should indicate correct placement in most babies (including the majority of those receiving acid suppressants) and rule out the possibility of respiratory tract placement. Always match the pH indicator strip or paper colour change with the colour code chart on the booklet or box. If there is ANY doubt about the position and/or clarity of the colour change on the pH indicator strip or paper, particularly between pH 5 and 6, DO NOT commence feeding.</td>
</tr>
<tr>
<td><strong>Aspirate is pH 6 or above</strong></td>
<td>The most likely reason for failure to obtain gastric aspirate pH 5.5 or below is the dilution of gastric acid by enteral feed. Wait giving time for the stomach to empty and then the pH value to fall. If pH is still 6 and above after waiting and replacing or re-passing the tube, seek advice and consider the following questions:</td>
</tr>
<tr>
<td>if clinically safe, consider waiting 15-30 minutes before aspirating again. Consider repositioning and/or re-passing the tube and re-aspirating.</td>
<td></td>
</tr>
<tr>
<td>if still pH 6 or above, seek advice</td>
<td>It is important that staff follow the flowchart, record the outcomes and make decisions based on this information.</td>
</tr>
</tbody>
</table>

**Document all information**

Documenting helps the clinical decision-making process. The tube size and length should be recorded each time the tube is passed. A record should also be made each time measurements of the pH level of the aspirate and the length of the tube’s advancement or retraction are done.

**Problems obtaining aspirate: suggest using larger size tubes with multiple ports. Turn baby onto his/her side**

This may facilitate the tip of the nasogastric tube entering the gastric fluid pool.

| Inject 1-2ml of air using a syringe | Injecting air through the tube may dislodge the exit-port of the feeding tube from the gastric mucosa. Care must be taken when using large syringes on neonates to ensure that the correct amount of air is inserted, i.e., no more than 2ml. |
| **Advance or retract the tube by 1-2cm** | If the tube is in the oesophagus, advancing it may allow it to pass into the stomach. If the tube has been inserted too far, it may be in the duodenum. Consider withdrawing a few centimetres and re-aspirating. The position of the tube in the nose should already have been recorded and marked, if the tube is in situ. If the mark has not moved then advancing or retracting may not make a difference. Document the length of tube if moved. |
| **Stop if there is any resistance or obstruction** | If you still cannot obtain aspirate | If this is an initial insertion then consider replacing or re-passing the tube. If the tube has been in situ already seek advice. Consider whether the length of the tube has changed and discuss options as outlined under the action point on aspirate of pH 6 and above. Record all decisions and their rationales. |

For more information about the safety issues involved please see [www.npsa.nhs.uk/advice](http://www.npsa.nhs.uk/advice)
2.6 Gastric decompression (emptying stomach of air and gastric contents):

Follow guideline for care of infant requiring a naso/orogastric tube.
Gastric decompression may be required for the baby who is:
- Nil by mouth and receiving Vapotherm, CPAP or mechanical ventilation.
- Receiving resuscitation.
- Nil by mouth pending investigation of gastrointestinal problems.
- Nil by mouth prior to, during and after surgery.
- To determine absorption of feed.
Gastric decompression is achieved by:
Gastric tube (the largest possible if there is bilious aspirate/surgical concerns), placed on free drainage using a closed bag with drainage facility with intermittent aspiration using a minimum of a 10ml oral syringe. Frequency of aspiration is dependent upon the condition of the baby and the volume of gastric aspirate.

2.7 Stomach washout:
Stomach washouts are rarely performed, but may still be useful in certain situations when performed by an experienced practitioner.

Follow guideline for care of infant requiring a naso/orogastric tube.
- A stomach washout may be required for the baby who has: Persistent mucous vomits or has swallowed maternal blood and is vomiting.
- The washout should be performed using warmed, sterile water in aliquots of 10 – 20mls. Each aliquot must be drained out or aspirated prior to further instillations. Cease the washout when aspirate clear.

2.8 Exclusion of congenital anomalies:
The inability to pass a nasogastric tube beyond the nares is indicative of choanal atresia and is a medical emergency.
Resistance to passage of a naso/orogastric tube beyond the oropharynx is indicative of oesophageal atresia.
A gastric tube should be inserted prior to chest or abdominal x-ray to facilitate differential diagnosis.
APPENDIX 1 Flow chart for neonatal patients. Reducing the harm caused by misplaced feeding tubes

1. Check for signs of tube displacement (if not initial insertion)
2. Reposition or repass tube, if not initial insertion
3. Aspirate using a syringe and gentle pressure

Aspirate not obtained

DO NOT FEED
1. If possible, turn baby onto higher side
2. Re-aspirate
3. Check pH level

Aspirate not obtained

DO NOT FEED
1. Inject 1-2ml of air into the tube using syringe
2. Re-aspirate
3. Check pH level

Aspirate not obtained

DO NOT FEED
1. Advance or retract the tube 1-2cm, if initial insertion, any resistance, STOP
2. Re-aspirate
3. Check pH level

Aspirate not obtained

CAUTION: DO NOT FEED AND:
1. If initial insertion, consider replacing or re-passing tube
2. If tube in situ, seek senior advice,
3. Only consider chest and abdominal x-ray if timely
4. Document decisions and rationale

CAUTION: DO NOT FEED AND:
1. Consider waiting 15-30 minutes then re-aspirate
2. Consider replacing or re-passing tube and re-aspirating
3. If still pH 6 or above, seek senior advice

DOCUMENT
1. Measure length of tube and document, if initial insertion
2. pH of aspirate
3. Length of tube advancement/retraction, if done

pH 6 or above

Test on pH strip or paper

pH 5.5 or below

Proceed to feed
Decision tree for nasogastric tube placement checks in **CHILDREN** and **INFANTS** (NOT NEONATES)

- Estimate NEX measurement (Place exit port of tube at tip of nose. Extend tube to earlobe, and then to xiphisternum)
- Insert fully radio-opaque nasogastric tube for feeding (follow manufacturer’s instructions for insertion)
- Confirm and document secured NEX measurement
- Aspirate with a syringe using gentle suction

**Aspirate obtained?**

**YES**

- Try each of these techniques to help gain aspirate:
  - If possible, turn child/infant onto left side
  - Inject 1-5ml air into the tube using a syringe
  - Wait for 15-30 minutes before aspirating again
  - Advance or withdraw tube by 1-2cm.
  - Give mouth care to patients who are nil by mouth (stimulates gastric secretion of acid)
  - Do not use water to flush

- Test aspirate on CE marked pH indicator paper for use on human gastric aspirate

**pH between 1 and 5.5**

- **PROCEED TO FEED or USE TUBE**
  - Record result in notes and subsequently on bedside documentation before each feed/medication/flush.

**pH NOT between 1 and 5.5**

- **Aspirate obtained?**
  - **NO**
    - Proceed to x-ray: ensure reason for x-ray documented on request form

  - **YES**
    - Competent clinician (with evidence of training) to document confirmation of nasogastric tube position in stomach

**DO NOT FEED or USE TUBE**

- Consider re-siting tube or call for senior advice

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**A pH of between 1 and 5.5 is reliable confirmation that the tube is not in the lung, however it does not confirm gastric placement as there is a small chance the tube tip may sit in the oesophagus where it carries a higher risk of aspiration. If this is any concern, the patient should proceed to x-ray in order to confirm tube position.**

**Where pH readings fall between 5 and 6 it is recommended that a second competent person checks the reading or retests.**

www.npsa.nhs.uk/alerts
3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Adherence to this guideline. Use of appropriate method of insertion, testing of correct placement and documentation of procedure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Unit and ward managers</td>
</tr>
<tr>
<td>Tool</td>
<td>Audit</td>
</tr>
<tr>
<td>Frequency</td>
<td>Annually or as part of incident review.</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Department lead and unit/ward managers</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Department lead and unit/ward managers</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders</td>
</tr>
</tbody>
</table>

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
### Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Clinical Guideline for the care of a neonate, Child or Young person requiring NG/NO tube.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>22 July 2013</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>22 July 2013</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>1 July 2016</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Tabitha Fergus Deputy Ward Manager Child Health</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 25 2800</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>Guideline for use of ng/no tubes in neonates and child health.</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Nasogastric Paediatric Neonates Tube feeding</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT</td>
</tr>
<tr>
<td>Executive Director responsible for Policy:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>July 2013</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Guideline for the care of a Neonate requiring a Naso/orogastric Tube.</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Practice Development forum Audit and Guidelines Unit manager-Neonates Lead nurse and ward managers-Child Health.</td>
</tr>
<tr>
<td>Divisional Manager confirming approval processes</td>
<td></td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td></td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet</td>
</tr>
</tbody>
</table>
Clinical guideline for the Care of a Neonate, Child or Young person requiring NG/NO tube.

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# Appendix 2. Initial Equality Impact Assessment Screening Form

| Name of service, strategy, policy or project (hereafter referred to as policy) to be assessed: Clinical guideline for the care of a neonate, child or young person requiring NG/NO tube |
| Directorate and service area: Child Health | Is this a new or existing Procedure? Existing |
| Name of individual completing assessment: T. Fergus | Telephone: 01872252800 |

| 1. Policy Aim* | To provide clear care guidelines for patients requiring NG/NO tube. |
| 3. Policy – intended Outcomes* | |
| 4. How will you measure the outcome? | audit |
| 5. Who is intended to benefit from the Policy? | Patients requiring this procedure and staff involved in implementing care. |
| 6a. Is consultation required with the workforce, equality groups, local interest groups etc. around this policy? | no |
| b. If yes, have these groups been consulted? | |
| c. Please list any groups who have been consulted about this procedure. | |

*Please see Glossary

## 7. The Impact

Please complete the following table using ticks. You should refer to the EA guidance notes for areas of possible impact and also the Glossary if needed.

- Where you think that the *policy* could have a **Positive** impact on any of the equality group(s) like promoting equality and equal opportunities or improving relations within equality groups, tick the ‘Positive impact’ box.
- Where you think that the *policy* could have a **Negative** impact on any of the equality group(s) i.e. it could disadvantage them, tick the ‘Negative impact’ box.
- Where you think that the *policy* has **no impact** on any of the equality group(s) listed below i.e. it has no effect currently on equality groups, tick the ‘No impact’ box.
<table>
<thead>
<tr>
<th>Equality Group</th>
<th>Positive Impact</th>
<th>Negative Impact</th>
<th>No Impact</th>
<th>Reasons for decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>X</td>
<td></td>
<td></td>
<td>Child health policy</td>
</tr>
<tr>
<td>Disability</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion or belief</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Gender</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>Transgender</td>
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<td>X</td>
<td></td>
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<tr>
<td>Pregnancy/Maternity</td>
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<td>X</td>
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<tr>
<td>Race</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Marriage/Civil Partnership</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- A negative impact and
- No consultation (this excludes any policies which have been identified as not requiring consultation).

8. If there is no evidence that the policy promotes equality, equal opportunities or improved relations - could it be adapted so that it does? How?

| 8. If there is no evidence that the policy promotes equality, equal opportunities or improved relations - could it be adapted so that it does? How? | Full statement of commitment to policy of equal opportunities is included in the policy |

Please sign and date this form.

Keep one copy and send a copy to Matron, Equality, Diversity and Human Rights, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Chyvean House, Penventinnie Lane, Truro, Cornwall, TR1 3LJ

A summary of the results will be published on the Trust’s web site.

Signed ____________________ T. Fergus ____________________

Date ____________________ July 2013 ____________________