CLINICAL GUIDELINE FOR INSERTION AND PLACEMENT CONFIRMATION OF A FINE BORE NASOGASTRIC FEEDING TUBE IN ADULTS ONLY

1. Aim/Purpose of this Guideline
   1.1. The purpose of this guideline is to provide clinical staff with clear standards in the safe insertion and confirmation of position of fine bore nasogastric feeding tubes.

   1.2. This guideline applies to confirmation of nasogastric tube position in adults. Children, infants and neonates are excluded from the scope of this guideline.

   1.3. The guideline has been written taking into account National Patient Safety Agency’s Alert (NPSA) March 2011 “Reducing the harm caused by misplaced nasogastric feeding tubes in adults, children and infants” which highlights the risk that nasogastric tubes can be misplaced during insertion or may partially move out of the stomach at a later stage, increasing the risk of aspiration. In addition the guideline acknowledges the rapid response report March 2012 “harm from flushing of nasogastric tubes before confirmation of placement and lists the recommendations and actions.

   1.4. The guidance aims to:

   - Guide the assessment and decision-making process for insertion of nasogastric tubes.
   - Ensure correct equipment and testing methods are used by staff.
   - Provide staff with evidence based guidance to support practice.

This guideline also supports the competency framework associated with enteral feeding and staff should use this guideline in association with the RCHT Guideline-Use of fine bore nasogastric tube with Nasal Bridle (AMT Bridle)

2. The Guidance
   2.1. Competency:

   2.1.1. All patients requiring nasogastric insertion should be managed and supported by appropriately trained clinical staff assessed as competent in the procedure and who are practicing within the scope of their role. Skills and competencies should be reviewed regularly and updated to reflect new practice in the management of a nasogastric tube. A useful training resource for medical staff in x-ray interpretation of nasogastric position is available at www.trainingnt.co.uk

   2.1.2. Appropriately trained clinical staff must be able to:
- Insert a nasogastric tube
- Know what action to take if aspirate is unobtainable
- Know what action to take if pH is greater than 5.5
- Administer feeds / medication via an nasogastric tube
- Undertake mouth / nasal care adults with nasogastric tube
- Interpret nasogastric placement

2.2. Ethical considerations:
The suitability of the patient for a nasogastric tube should be discussed and agreed within the multidisciplinary team. A detailed explanation of the procedure (need and process) should be discussed with the patient / relative / carers and consent sought and documented prior to insertion. For patients who lack capacity, due process must be followed regarding best interests including the involvement of an Independent Mental Capacity Advocate (IMCA) where necessary.

2.3. Risk Assessment:

2.3.1. Before a decision is made to insert a nasogastric tube, an assessment should be undertaken to identify if nasogastric feeding is appropriate for the patient, and the rationale for any decision is recorded in the patient’s medical notes.

2.3.2. A decision must be made that balances the risks with the need to feed or administer medications. Patients who are comatose or semi-comatose, have swallowing dysfunction or recurrent retching or vomiting, have a higher risk of placement error or migration of the tube. Patients on antacid medication may likely have a pH level of 6 and above, making confirmation of the tube position more difficult. Medical advice should be sought for patients on anticoagulants.

2.3.3. Action to reduce all identified risks and the rationale behind these actions should be documented prior to insertion of a nasogastric tube for the purpose of feeding. Therefore the decision to insert a nasogastric tube for the purpose of feeding must be made following careful assessment of risks by at least two competent healthcare professionals, including the senior doctor responsible for the patient’s care.

2.3.4. Details of assessment must be recorded in the patient’s medical notes prior to commencement of feed and should include signed, dated and timed entry of the process of initial risk assessment that evaluates the risks of introducing a nasogastric tube for the purpose of feeding.

2.3.5. Patients with altered anatomy e.g. oesophageal fistula, pharyngeal pouch or in certain conditions will require referral to a specialist team i.e. Interventional radiology, ENT, endoscopy for consideration of their suitability for nasogastric insertion and the procedure only attempted under fluoroscopic control. For example:

- Neuro-disabilities / complex health needs
- Maxillo-facial disorders, surgery or trauma
- Oesophageal tumours or surgery
Guideline for insertion and placement confirmation of a fine bore nasogastric feeding tube with introducer in adults, children and infants.

- Laryngectomy
- Oro-pharyngeal tumours / surgery
- Nasal CPAP

Do not insert nasogastric tube in an unconscious patient who has sustained a head injury. Orogastric placement is the route of choice unless cranial fracture has been excluded.

**Types of Nasogastric Feeding Tubes**

**Polyurethane tubes**

Fine bore (\(\leq 12\)FG) polyurethane tubes overcome the complications associated with wide bore (>12FG) tubes and can remain in situ for 6-8 week or as manufacturer's instructions.

The Corflo fine bore feeding tube (8 /10 FG) is supplied with an introducer wire to aid passage and are NPSA compliant. They cause fewer traumas to the nasopharynx and oesophagus. However, they are more easily displaced by coughing or vomiting than larger bore tubes and there is a greater chance of being passed into a bronchus and this therefore requires regular position checks before administration of feeds and/or medicines and if there is any doubt about position (appendix 7). The narrow design of such tubes allows for better patient comfort and is less obtrusive, increasing patient compliance.

**Polyvinylchloride (PVC) tubes**

Wide bore (>12FG) Ryles (not radio-opaque) are frequently inserted for the purpose of gastric drainage, however the non-radio opaque tubes are not NPSA compliant; therefore **must not** be used for the purpose of enteral feeding (NPSA 002, 2011). In certain circumstances, such as the critical care setting it may be necessary to administer enteral feed via a wide bore gastric tube. This tube must meet NPSA requirements of having radio-opaque/centimetre markings. The Corflo 12FR tube can be used for these patients. Patients should not be fed through Ryles drainage tubes as they are not NPSA compliant.

In rare circumstances where there are medical contraindications for exchanging Ryles for fine bore tubes, there must be robust risk assessment supported by documentation and this must be reviewed on a daily basis and changed for a fine bore feeding tube as soon as possible.

These feeding tubes may be associated with the following complications:

- Rhinitis
- Pharyngitis
- Oesophageal ulceration
- Gastric erosion (Payne James et al 2001)
- Increased tendency for reflux
- Patient discomfort
- Difficulty in swallowing
The specific manufacturer will provide guidance on the maximum length of time a tube can remain in situ. PVC material has the risk of leaching plasticizers within the tube causing it to become brittle and increasing the risk of gastric erosions and ulcerations.

2.4 Appropriate times:

2.4.1 Placement of nasogastric tubes should not occur at times when there is insufficient support available to accurately confirm placement should any ambiguity arise. Unless clinically urgent, nasogastric placement should be delayed until support is available.

2.4.2 If the risk of delay in feeding or administering medication to an acutely unwell patient is considered by senior clinical staff responsible for that patient to outweigh the risk of interpretation of tube position and commencing feeding, then this decision and the rationale must be clearly documented in the patient’s medical notes.

2.5 Insertion of nasogastric tube (See Appendix 1)

2.5.1 Do not pre-flush water down the feeding due prior to insertion as this can affect the pH of the aspirate giving a false positive result.

2.5.2 Nasogastric tubes must not be flushed, nor any liquid/feed/medications introduced through the tube following initial placement until the stomach tip is confirmed by pH testing or x-ray, to be in the stomach.

2.6 Confirmation of nasogastric tube position

2.6.1. The NPSA alert highlighted that many methods used to check placement of nasogastric tubes are inaccurate on their own and can increase the risk of a misplaced tube being used for feeding. Therefore:

- Auscultation of air insufflated through the feeding tube (“whoosh test”) is unreliable and should not be used at any time.

- Testing of aspirate with litmus paper not recommended for use for gastric testing should not be used. It is not sensitive enough to distinguish between bronchial and gastric secretions. Only pH indicator strips that are CE marked and intended by the manufacturer to test human gastric aspirate must be used.

- Do not rely on monitoring bubbling at the end of the tube as this is unreliable as the stomach also contains air bubbles and could falsely indicate respiratory placement.

- Do not rely on only on observing the appearance of the tube aspirate; gastric and respiratory secretions may look similar.

- Do not interpret the absence of respiratory distress as an indicator of correct position of tube. Fine bore tubes can enter the respiratory tract with few /no symptoms.
2.6.2 The NPSA has provided a decision tree for nasogastric placement checks and this should be followed at all times *(Appendices 3 and 4).

2.6.3 Nasogastric tubes must **NOT** be flushed, nor any liquid/feed/medications introduced through the tube following initial placement, until the tube tip is confirmed by pH testing or x-ray, to be in the stomach.

- NOTHING should be introduced down the tube before gastric placement has been confirmed.
- DO NOT FLUSH the tube before gastric placement has been confirmed.
- Internal guidewires/ stylets should NOT be lubricated before gastric placement has been confirmed.

2.6.4 **First Line test method: pH paper**

2.6.4.1 pH testing is used as the first line test method, with pH between 1 and 5.5 as the safe range, and that each test and test result is documented on a chart kept at the patient’s bedside. (See appendix 10: Tube positioning trouble shooting pictorial guide).

2.6.4.2 The aspirate must be obtained using a 60mL syringe as smaller syringes may fracture the tube through the use of excessive pressure. At least 0.5 - 1mL of aspirate is required to sufficiently cover the testing area. Allow for 10 seconds for the colour to change sufficiently. Instill 10-20mL of air in the tube to help clear other substances from the tube.

2.6.4.3 It should be noted that in some cases pH level of gastric contents may be elevated due to medications. The initial risk assessment needs to identify actions that staff should take in this scenario and document them in the care plan.

2.6.4.4 pH readings should be between 1 and 5.5 in order for feeding to commence safely. Readings that fall within the range 5.5 and above should be checked by a second person competent in nasogastric procedures.

2.6.4.5 All pH tests and test results must be recorded on a RCHT nasogastric care plan (CHSA 2821) and kept at the patient’s bedside (appendix 5).

2.6.4.6 Documentation following pH testing should include:

- whether aspirate was obtained;
- what the aspirate pH was;
- who checked the aspirate pH;
- when it was confirmed to be safe to administer feed and/or medication (i.e. gastric pH between 1 and 5.5).

2.6.4.7 This should be documented by the person who passed the tube. The method of testing the tube position must be documented. Each test and test result should be documented on a chart kept at the patient’s bedside.
2.6.4.8 Factors that may affect the pH are proton pump inhibitors (PPI), H₂ antagonists and antacids. Patients on PPIs will often have a raised gastric pH. If a gastric pH is consistently above 5.5 and a chest x-ray has confirmed the correct initial positioning of the nasogastric tube, it is usually not in the patient’s best interests to undergo daily x-rays to ascertain tube positioning. If there is no reason to suspect displacement (see Appendix 7) however if there is any subsequent evidence that the tube has displaced or there are signs of respiratory distress, a chest x-ray would be appropriate to ascertain tube positioning.

2.6.4.9 If obtaining a suitable pH is persistently difficult and results in delayed feeding, the ward pharmacist/medical team should review the medication and administration times. Temporary cessation of proton pump inhibitors, H₂ antagonists and antacid preparations may be considered by the patient’s medical team, as appropriate (See Appendix 9: Algorithm to assist in confirming nasogastric position).

2.6.5 Second line test method: X-ray confirmation (Appendix 6)

2.6.5.1 X-ray is used as a second line test when no aspirate could be obtained or pH indicator paper has failed to confirm the location of the nasogastric tube and that:

- The request form must clearly state that the purpose of the x-ray is to establish the position of the nasogastric tube for the purpose of feeding.
- It is the radiographer’s responsibility to ensure that the nasogastric tube can be clearly seen on the x-ray to be used to confirm tube position.
- X-rays must only be interpreted and nasogastric tube position confirmed by someone assessed as competent to do so.
- If there is any difficulty in interpretation the advice of a radiologist should be sought.
- Any nasogastric tubes identified to be in the lung should immediately be removed whether in the x-ray department or clinical area.

2.6.5.2 Position checks and documentation by medical staff

Medical staff involved with nasogastric tube position checks must have been assessed as competent through theoretical and practical training. Documentation following X-ray should include:

- Who authorised the x-ray
- Who confirmed the position of the nasogastric tube. This person must be evidenced as competent to do so
- Confirmation that any x-ray viewed was the most current x-ray for the correct patient.
- The rationale for the confirmation of position of the nasogastric tube, i.e. how placement was interpreted, and clear instructions as to required actions. For example:

  19 January 2011, 10:30 – Dr A. Smith – core surgical trainee

  X-ray taken at 10:15 today
  nasogastric tube passed down midline, past level of diaphragm and deviates to left
  Tip is seen in stomach
  Plan: nasogastric tube safe to use for feeding
2.6.6 The radiographer taking the x-ray must ensure that exposure of the x-ray is adjusted so that the nasogastric tube is visible to the bottom of the film and that it shows the abdomen as far as possible below the diaphragm; shows the bottom of both hemi-diaphragms (midline). X-rays that do not include the above will not allow accurate interpretation of nasogastric tube placement and should not be allowed out of the x-ray department (see clinical imaging protocol).

2.6.7 The radiologist on reporting the placement film must document the position of the nasogastric tube and tip and whether it is safe to proceed with the administration of liquids via the tube.

2.7 **Ongoing confirmation of gastric positioning of the nasogastric tube**

2.8 Repeated checks after the initially correct placement has been confirmed are required. The RCHT care plan CHA 2821 V2. should be used at all times for any patient with a nasogastric tube in situ and completed daily.

2.9 Guidance on repeated checks is provided in Appendix 7.

2.10 **Misplacements.**

2.10.1 All misplacement incidents should be reported locally by completing the risk reporting system (Datix). (A misplaced feeding tube can be considered as a tube which on testing for position does not satisfy the correct guidance and is then used for feeding). Incidents will be uploaded to the NRLS to enable national monitoring of misplaced nasogastric feeding tubes.

2.12 (The NPSA will automatically receive information on incidents through the National).

2.13 **Transfer of care to community settings**

Before a patient with a nasogastric tube is discharged from hospital there should be local arrangements for a full multidisciplinary supported risk assessment that documents safe discharge. This should be communicated to community staff along with the ongoing confirmation of nasogastric tube placement whilst in the community setting (see appendix 8)

### 2. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>a) Misplacement of nasogastric tubes</th>
<th>b) Correct pH stock</th>
<th>c) Correct documentation and completion of care plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>See section “acting on recommendations and leads” Nutrition steering group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool</td>
<td>Root cause analysis of Datix incidents b&amp;c) retrospective case note review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>As they arise. b&amp;c) annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Incidents that are uploaded to the NRLS are included in the risk and safety / clinical governance reports and presented at committee. All serious incidents are subject to root cause analysis</td>
<td></td>
<td></td>
</tr>
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</table>
along with recommendations and actions. Outcomes of case notes review will be reported to the Strategic Nutrition Steering Group.

| Acting on recommendations and Lead(s) | The SNSG is responsible for interrogating required SI actions and to designate a named lead where appropriate. This is documented in meeting minutes. Designated Leads will then take forward where appropriate the lessons to be shared with all the relevant stakeholders. |
| Change in practice and lessons to be shared | As monitoring includes using incidents, complaints and serious incidents as a resource for monitoring practice it is actions identified from root cause analysis that determine whether local, divisional or corporate learning will need to be shared and changes implemented. |

4. **Equality and Diversity**

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

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

<table>
<thead>
<tr>
<th><strong>Document Title</strong></th>
<th>Guideline for insertion and placement confirmation of a fine bore nasogastric feeding tube in adults only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date Issued/Approved:</strong></td>
<td>April 2015</td>
</tr>
<tr>
<td><strong>Date Valid From:</strong></td>
<td>April 2015</td>
</tr>
<tr>
<td><strong>Date Valid To:</strong></td>
<td>April 2018</td>
</tr>
<tr>
<td><strong>Directorate / Department responsible (author/owner):</strong></td>
<td>Tracy Lee, Nutrition Specialist</td>
</tr>
<tr>
<td><strong>Contact details:</strong></td>
<td>01872 252301</td>
</tr>
<tr>
<td><strong>Brief summary of contents</strong></td>
<td>This policy sets the standards of clinical safety that all RCHT staff must adhere to when undertaking insertion of nasogastric fine bore feeding tubes and verifying correct placement. The document complies with NPSA guidance.</td>
</tr>
<tr>
<td><strong>Suggested Keywords:</strong></td>
<td>Fine bore / nasogastric Tube / Feeding Tube / nasogastric Placement</td>
</tr>
<tr>
<td><strong>Target Audience</strong></td>
<td>RCHT</td>
</tr>
<tr>
<td><strong>Executive Director responsible for Policy:</strong></td>
<td>Director of Nursing, Midwifery and Allied Health Professionals</td>
</tr>
<tr>
<td><strong>Date revised:</strong></td>
<td>2 February 2015</td>
</tr>
<tr>
<td><strong>This document replaces (exact title of previous version):</strong></td>
<td>Procedure for insertion of a fine bore nasogastric feeding tube with introducer; Version 6.2</td>
</tr>
<tr>
<td><strong>Approval route (names of committees)/consultation:</strong></td>
<td>Strategic Nutrition Steering Group (16.3.15) CSSC Governance DMB (14.4.15)</td>
</tr>
<tr>
<td><strong>Divisional Manager confirming approval processes</strong></td>
<td>Sally Rowe, Divisional Director CSSC</td>
</tr>
<tr>
<td><strong>Name and Post Title of additional signatories</strong></td>
<td>Janet Gardner, Governance Lead CSSC</td>
</tr>
<tr>
<td><strong>Signature of Executive Director giving approval</strong></td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td><strong>Publication Location (refer to Policy on Policies – Approvals and Ratification):</strong></td>
<td>Internet &amp; Intranet</td>
</tr>
<tr>
<td><strong>Document Library Folder/Sub Folder</strong></td>
<td>Clinical / Dietetics</td>
</tr>
<tr>
<td><strong>Links to key external standards</strong></td>
<td>Care Quality Commission (2009) Provider Compliance assessment Tool Outcome 5 (Regulation 14) Meeting Nutritional Needs London CQC</td>
</tr>
</tbody>
</table>
Related Documents:

- RCHT Guideline- Use of fine bore nasogastric tube (nasogastric) with Nasal Bridle (AMT Bridle TM)
- RCHT Clinical Imaging Protocol for the Thorax Incl. Nasogastric Tube Placement
- RCHT Consent policy
- NPSA 2011– reducing harm caused by misplaced nasogastric feeding tubes in adults, children and infants. PSA002
- NPSA (2005) Patient safety alert 05 Reducing the harm caused by misplaced nasogastric feeding tubes
- London NPSA
- NPSA 2012 Rapid response report ‘harm from flushing of nasogastric tubes before confirmation of placement

Training Need Identified? Yes

Version Control Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
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<tr>
<td>15 Jun 12</td>
<td>V6.0</td>
<td>Previous version history not known</td>
<td></td>
</tr>
<tr>
<td>25 Jan 13</td>
<td>V6.1</td>
<td>Section 2.6.3 added, listed Rapid Response Report (RRR) recommendations.</td>
<td>Tracy Lee Nutrition Specialist</td>
</tr>
<tr>
<td>07 April 14</td>
<td>V6.2</td>
<td>Detail added to para 2.5. Insertion of nasogastric tube</td>
<td>Tracy Lee Nutrition Specialist</td>
</tr>
<tr>
<td>01 Feb 15</td>
<td>V6.3</td>
<td>Title and content amended to reflect that guideline now applies to adults only</td>
<td>Tracy Lee Nutrition Specialist</td>
</tr>
</tbody>
</table>

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.
This document is only valid on the day of printing

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### Appendix 2. Initial Equality Impact Assessment Screening Form

<table>
<thead>
<tr>
<th>Name of service, strategy, policy or project (hereafter referred to as policy) to be assessed: Guideline for insertion and placement confirmation of a fine bore nasogastric feeding tube in adults only</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Directorate and service area: Clinical Support Services &amp; Cancer Division, Therapies Dept, Nutrition support team</th>
<th>Is this a new or existing Procedure? Existing</th>
</tr>
</thead>
</table>

| Name of individual completing assessment: Tracy Lee | Telephone: 01872 252409 |

| 1. Policy Aim*  
Who is the strategy / policy / proposal / service function aimed at? | To provide a consistent standard for insertion and placement confirmation of a fine bore nasogastric tube |

| 2. Policy Objectives* | To prevent adverse events associated with incorrectly placed nasogastric tubes through consistent checks and supporting documentation. |

| 3. Policy – intended Outcomes* | Prevent or reduce adverse consequences associated with misplaced or migrated nasogastric tubes. |

| 4. *How will you measure the outcome? | As per NHSLA events |

| 5. Who is intended to benefit from the policy? | All adult inpatients and clinical staff |

| 6a) Is consultation required with the workforce, equality groups, local interest groups etc. around this policy? | Yes |

| b) If yes, have these *groups been consulted? | Yes |

| C). Please list any groups who have been consulted about this procedure. | RCHT Operational Nutrition steering group  
Senior matrons and matrons, Clinical Governance Lead – Clinical Imaging |

| 7. The Impact  
Please complete the following table. |

| Are there concerns that the policy could have differential impact on: |
|---|---|---|
| Equality Strands: | Yes | No |

| Age | Yes |

The policy will prevent discrimination or inappropriate feeding or withholding of artificial feeding for older people through proper assessment of the clinical need, risk assessment, assessment of mental capacity and consideration of best interests.
| **Sex** (male, female, transgender / gender reassignment) | √ | This guideline relates to clinical need and documentation |
| **Race / Ethnic communities /groups** | √ | This guideline relates to clinical need and documentation |
| **Disability** - Learning disability, physical disability, sensory impairment and mental health problems | √ | This guideline emphasises the additional needs of patients who have a disability or lack capacity |
| **Religion / other beliefs** | √ | This guideline relates to clinical need and documentation |
| **Marriage and civil partnership** | √ | This guideline relates to clinical need and documentation |
| **Pregnancy and maternity** | √ | This guideline relates to clinical need and documentation |
| **Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian** | √ | This guideline relates to clinical need and documentation |

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:
- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation - this excludes any policies which have been identified as not requiring consultation. or
- Major service redesign or development

8. Please indicate if a full equality analysis is recommended.  

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

9. If you are not recommending a Full Impact assessment please explain why.

No potential for differential impact identified

<table>
<thead>
<tr>
<th>Signature of policy developer / lead manager / director</th>
<th>Date of completion and submission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>02/02/2015</td>
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<table>
<thead>
<tr>
<th>Names and signatures of members carrying out the Screening Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tracy Lee</td>
</tr>
<tr>
<td>2.</td>
</tr>
</tbody>
</table>

**Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead, c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD**

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

Signed __________________________

Date __________________________
Appendix 3. Procedure

**EQUIPMENT**  
Adapted from Royal Marsden 2011

- Clinically clean tray
- Fine-bore radio-opaque nasogastric tube
- Introducer for tube
- Receiver
- Sterile water
- 50 mL enteral syringe *(for paediatric patients please refer to manufacturer’s instructions)*
- Hypoallergenic tape
- Adhesive patch if available
- Glass of water
- CE marked-indicator strips with pH range of 0–6 or 1–11 with gradations of 0.5

**PREPARATION**

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explain and discuss the procedure with the patient.</td>
<td>To ensure that the patient understands the procedure and gives his/her valid consent (NMC 2008b, C).</td>
</tr>
<tr>
<td>2. Arrange a signal by which the patient can communicate if they want the nurse to stop, for example by raising their hand. For young children it is essential to prepare the child and family if possible by involving play specialists using picture books, toys and video aids.</td>
<td>The patient is often less frightened if they feel that they have some control over the procedure.</td>
</tr>
<tr>
<td>3. Assist the patient to sit in a semi-upright position in the bed or chair. Support the patient’s head with pillows. Note: The head should not be tilted backwards or forwards (Rollins 1997). Find the most appropriate position for the younger child depending on age and the ability to co-operate. An older child may be able to sit upright with support to their back and head. Younger children may sit on their parent’s / carer’s lap (RCN 2003).</td>
<td>To allow for easy passage of the tube. This position enables easy swallowing and ensures that the epiglottis is not obstructing the oesophagus.</td>
</tr>
<tr>
<td>4. Select the appropriate distance mark on the tube by measuring the distance on the tube from the patient’s earlobe to the bridge of the nose plus the distance from the earlobe to the bottom of the xiphisternum (the NEX measurement) (see Action Figures 4a, 4b).</td>
<td>To ensure that the appropriate length of tube is passed into the stomach NPSA 2011, C.</td>
</tr>
<tr>
<td>5. Wash hands with bactericidal soap and water or bactericidal alcohol handrub, and assemble the equipment required.</td>
<td>Hands must be cleansed before and after patient contact to minimize cross-infection (Fraize and Bradley 2009).</td>
</tr>
</tbody>
</table>

**PROCEDURE**

6. Follow manufacturer’s instructions to prepare the tube.

**NOTHING SHOULD BE INTRODUCED DOWN THE TUBE BEFORE GASTRIC PLACEMENT HAS BEEN CONFIRMED.**

7. Check that the nostrils are patent by asking the patient to sniff with one nostril closed. Repeat with the other nostril.  
8. Insert the rounded end of the tube into the clearer nostril and slide it backwards and inwards along the floor of the nose to the nasopharynx. If any obstruction is felt, withdraw the tube and try again in a slightly different direction or use the other nostril.  
9. As the tube passes down into the nasopharynx, unless swallowing is contraindicated, ask the patient to start swallowing other than the tube. A swallowing action closes the glottis and the cricopharyngeal sphincter opens, enabling the tube to pass
**Action**

**Guideline for insertion and placement confirmation of a fine bore nasogastric feeding tube with introducer in adults, children and infants.**

10 Advance the *tube* through the pharynx as the patient swallows until the predetermined mark has been reached (NEX measurement). If the patient shows signs of distress, for example gasping or cyanosis, remove the *tube* immediately.

11 Remove the introducer by using gentle traction. If it is difficult to remove, then remove the *tube* as well.

**POST PROCEDURE**

12 Secure the tape to the nostril with adherent dressing tape, for example Elastoplast, or an adhesive nasogastric stabilization/securing device (Burns et al. 1995). Alternatively Tegaderm/Deoderm can be applied to the cheek and then covered in Mepore to secure the nasogastric *tube*, this can help to prevent skin irritation. A hypoallergenic tape should be used if an allergy is present.

**REMAINDER: NOTHINGSHOULD BE INTRODUCED DOWN THE TUBE BEFORE GASTRIC PLACEMENT HAS BEEN CONFIRMED**

13 Measure the part of the visible *tube* from tip of nose and record this and the NEX measurement in care plan. Mark the *tube* at the exit site with a permanent marker pen (nares).

14 Check the position of the *tube* to confirm that it is in the stomach by using the following methods.

**First line test method: pH paper**

Aspirate 0.5–1 mL of stomach contents and test pH on indicator strips (NPSA 2011, C; Rollins 1997). When aspirating fluid for pH testing, wait at least 1 hour after a feed or medication has been administered (either orally or via the *tube*). Before aspirating, flush the *tube* with 20 mL of air to clear other substances (Metheny et al. 1993). A pH level of between 1 and 5.5 is unlikely to be pulmonary aspirates and it is considered appropriate to proceed to feed through the *tube* (Metheny and Meert 2004, NPSA 2011).

If a pH of 6.0 or above is obtained or there is doubt over the result in the range of pH 5–6 then feeding must not commence until a second competent person checks the reading or retests. The nasogastric *tube* may need to be repositioned or checked with an X-ray.

**Second line test method: X-ray confirmation**

Take an X-ray of chest and upper abdomen.

15 The following methods must not be used to test the position of a nasogastric feeding *tube*: auscultation (introducing air into the nasogastric *tube* and checking for a bubbling sound via a stethoscope, also known as the 'whoosh test'), use of litmus paper or absence of respiratory distress.

16 Document the tip position in the patient's notes.

**Rationale**

into the oesophagus (Groher 1997, ).

The *tube* may have accidentally been passed down the trachea instead of the pharynx. Distress may indicate that the *tube* is in the bronchus. However, absence of distress is not sufficient for detecting a misplaced *tube* (NPSA 2005; NPSA 2011).

If the introducer sticks in the *tube*, this may indicate that the *tube* is in the bronchus.

To hold the *tube* in place. To ensure patient comfort.

To provide a record to assist in detecting movement of the *tube* (Metheny and Titler 2001; NPSA 2011).

Feeding via the *tube* must not begin until the correct position of the *tube* has been confirmed (NPSA 2011). To confirm placement of radio-opaque nasogastric *tube*.

Indicator strips should have gradations of 0.5 or paper with a range of 0–6 or 1–11 to distinguish between gastric acid and bronchial secretions (NPSA 2011).

To prove an accurate test result because the feed or medication may raise the pH of the stomach.

There is an increased risk of the nasogastric *tube* being incorrectly placed (NPSA 2011).

X-ray of radio-opaque *tubes* is the most accurate confirmation of position and is the method of choice in patients with altered anatomy, those who are aspirating or are unconscious with no gag reflex (NPSA 2011).

These tests are not accurate or reliable as a method of checking the position of a nasogastric *tube* as they have been shown to give false-positive results (Metheny and Meert 2004, E; NPSA 2011).

To record the position (NMC 2009).
• **Action Figure 4a**  Measuring for a nasogastric tube: measure from patient’s ear lobe to bridge of nose.

![Figure 4a](image)


• **Figure 4b**  Measuring for a nasogastric tube: measure from ear lobe to bottom of xiphisternum

![Figure 4b](image)

Appendix 4. Decision Tree for Nasogastric Tube Placement Checks in ADULTS

- 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 adult onto left side.
- Inject 10-20ml air into the tube using a 50ml 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

YES

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

NO

Aspirate obtained?

YES

NO

Proceed to x-ray; ensure reason for x-ray documented on request form.

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

YES

NO

DO NOT FEED OR USE TUBE
Consider re-siting tube or call for senior advice.

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
Appendix 5. Care Plan Form CHA2821

Guideline for insertion and placement confirmation of a fine bore nasogastric feeding tube with introducer in adults, children and infants.
<table>
<thead>
<tr>
<th>Observation Care element</th>
<th>Fine Bore Nasogastric Tube Insertion and Continuing Care Pathway in Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td></td>
</tr>
<tr>
<td>Fine Bore feeding tube still required</td>
<td></td>
</tr>
<tr>
<td>pH tested and equal to or less than 5.5 must be tested prior to administration of feed, fluids &amp; medicines</td>
<td>pH</td>
</tr>
<tr>
<td>Correct position marker on tube insertion</td>
<td></td>
</tr>
<tr>
<td>Insertion ....................................cms</td>
<td>....................................cms</td>
</tr>
<tr>
<td>Tube fixation clean and intact</td>
<td></td>
</tr>
<tr>
<td>Nasal area checked for erosion</td>
<td></td>
</tr>
<tr>
<td>Patient observations stable</td>
<td></td>
</tr>
<tr>
<td>(Apyrexial / normal respiratory rate)</td>
<td></td>
</tr>
<tr>
<td>Feed and flushes (sterile water) administered as per dietitian instruction or out of hours regimen (Document amount on fluid balance chart)</td>
<td></td>
</tr>
<tr>
<td>Correct patient position maintained &gt;=30°</td>
<td></td>
</tr>
<tr>
<td>Flush prior, in-between and following administration of medications</td>
<td></td>
</tr>
<tr>
<td>Mouth care administered</td>
<td></td>
</tr>
<tr>
<td>Fluid balance chart completed</td>
<td></td>
</tr>
<tr>
<td>Signature</td>
<td></td>
</tr>
<tr>
<td>Print</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 6. Patient Safety Alert

Nasogastric tubes: x-ray interpretation aid

To confirm gastric position of the nasogastric tube, ask:

- Does the tube path follow the esophagus/avoid the contours of the bronchus?
- Does the tube clearly border the carina or the bronchus?
- Does it cross the diaphragm in the midline?
- Is the tip clearly visible below the left hemidiaphragm?

Proceed to feed only if all criteria are met. If in any doubt, repeat x-ray or call for senior help.

Below are two examples where the nasogastric tube has been incorrectly identified as being in the stomach:

Radiograph 1 shows the tip of the nasogastric tube above the diaphragm and on the right-hand side of the thorax. The presence of pericardial effusion makes interpretation of the radiograph more difficult.

Radiograph 2 shows the tip of the nasogastric tube apparently below the left hemidiaphragm but the tube clearly follows the contours of the left bronchus. In fact, the tube is positioned in the left lower lobe of the lung.

X-rays must always be interpreted by someone assessed as competent to do so, and the decision to feed a patient must be documented in the patient's medical notes, dated, timed and signed by that person.
Appendix 7. When to Confirm Gastric Positioning of the Nasogastric Tube

**Note:** If feed / medication has already passed through the tube then at least one hour delay should be instigated before testing gastric aspirate using the correct pH paper, wherever aspirate can be obtained.

- On initial placement
- Before administering each bolus feed or administering feed / water following a rest period.
- Before giving medication
- If the patient has vomiting or retching episodes, coughing spasms or complains of discomfort
- If the patient becomes acutely distressed, breathless or has difficulty breathing.
- After oropharyngeal suctioning
- If there is any doubt about the position of the tube.

**NOTE:** The tube length must be recorded on a daily basis and prior to administration of any liquid via the nasogastric tube and documented on the RCHT NG care plan. Loose tape may also indicate movement. If the length has changed and aspirate unavailable then a medical review is required as the tube may need to be replaced and position confirmed before feeding is re-commenced.

- At least once daily during continuous feeding

**NOTE:** It may not be possible to obtain an aspirate with a pH between 1-5.5 for patients on continuous NG feeding, or when treated with acid-reducing medication or when medications are frequently passed down nasogastric tubes. Daily x-rays are not practical or safe.

In these circumstances where initial placement was appropriately confirmed and there is no reason to suspect displacement then confirmation that the length of the external tube remains identical to that recorded initially in the care plan, and that the fixation tapes have not moved or become loose may be used as confirmation.
Appendix 8. Patient and Carer Briefing

Checking the position of nasogastric feeding tubes

This information is for carers who look after infants, children or adults who use nasogastric feeding tubes, and patients in the community who can check the position of their own nasogastric feeding tube.

What are nasogastric feeding tubes?

Nasogastric feeding tubes are small tubes that are inserted through the nose, down the back of the throat and into the stomach. They are used to give food to people who have difficulty swallowing or feeding.

Why is it important to check the position of the nasogastric feeding tube?

It is important to check the position of the tube before feeding, or after a coughing fit or vomiting episode, to ensure that the food goes directly into the stomach and not into the lungs.

How can I check the position of the nasogastric feeding tube?

The most reliable way for you to check the position of the tube is to measure the pH (acidity/alkalinity) of the person's stomach contents using pH indicator strips or paper. These have a colour code chart indicating the colour change of each pH reading; from pH 1 (acid), through pH 7 (neutral) to pH 14 (alkaline).

REMEMBER: keep pH strips or paper clean and dry by storing them in a sealed container.

- wash your hands before and after checking the tube position;
- remove the cap or plug from the tube;
- attach a syringe containing air (1-5ml for infants and children; 10-20mls for adults) into the feeding tube and flush the air down the tube to remove any water or feed from the tube;
- draw back the syringe to obtain contents from the stomach (this is called 'aspirating' the tube);
- take the pH strip/paper and place a few drops of the stomach contents onto it;
- match the colour change of the strip/paper with the colour code on the box to identify the pH of the stomach contents;
- a pH reading of below 5.5 (or below 5 if your paper has single gradings) indicates an acid reaction, which means the tube is correctly positioned in the stomach.
What if it is not possible to obtain fluid for checking pH?

- check the tube length to see if the tube appears to have moved since it was first put in;
- turn the person (or ask someone to help you) onto their side, if this is possible;
- inject air down the tube (1-5ml for infants and children; 10-20mls for adults);
- draw back the syringe to obtain contents from the stomach (‘aspirating’);
- if they are able to drink, let them try, wait for a few minutes and try aspirating again.

What if I get a pH reading of more than 5.5?

If the person has just had a feed or is on continuous feeds, the milk in the stomach can increase the pH of stomach contents (they become more alkaline). If the person is on medication which reduces the acid in the stomach, you may also get a pH reading of more than 5.5. It is important that you speak to your nurse or doctor to find out if this is normal.

If a pH of more than 5.5 is measured:

- for continuous feeds, stop the feed, wait for up to one hour and test again;
- for feeds given at regular intervals (known as ‘bolus’ feeds), wait for up to one hour after feeding and test again.

If you are still unable to obtain contents from the stomach, or the pH is above 5.5, you should contact your community nurse or hospital professional (see previous page).

What are the risks associated with nasogastric feeding tubes?

Using nasogastric feeding tubes to provide nutrition is a very common procedure in the NHS. Thousands of these procedures are carried out safely every year and it is a vital part of care, particularly for people who have difficulty in swallowing or feeding.

However, some methods to check the placement of these tubes have been shown to be less reliable than others and things do go wrong. If the tube is not correctly inserted, it can accidentally be placed into the lungs instead of the stomach. This can happen without the patient, staff member or carer realising, as the patient may not experience any symptoms that indicate there is a problem. The National Patient Safety Agency (NPSA) is aware of 11 deaths and one case of serious harm in the last two years due to misplaced nasogastric feeding tubes.

This information has been developed by the NPSA to provide a guide to patients and carers about the most reliable testing methods they can use. Whilst no method is 100 per cent reliable, this information will help you to reduce the small risk of accidentally putting feed through a misplaced nasogastric feeding tube.

More information

You can call NHS Direct, a 24-hour nurse advice and health information service, on 0845 4647 or visit www.nhsdirect.nhs.uk for England or www.nhsdirect.wales.nhs.uk for Wales.

The NPSA was set up by the government to improve patient safety in the NHS in England and Wales. For more information about the NPSA’s work, visit www.npsa.nhs.uk

21 February 2005

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Appendix 9. Algorithm to assist in confirming nasogastric position
Adopted from East Cheshire HNS Trust

ALGORITHM 2 - TO ASSIST IN CONFIRMING NG POSITION IF NO ASPIRATE OR PH VALUE INCONCLUSIVE

NO ASPIRATE

ACTION A. CHECK FOR TUBE DISPLACEMENT

HAS THE EXTERNAL LENGTH OF THE TUBE CHANGED?
Check on mark at exit from nose and compare with
insertion data on monitoring charts/NG core plan.

No

HAS THE MARK AT THE EXIT FROM THE NOSE SLIPPED?

No

HAS THE PATIENT VOMITED?

No

HAS THERE BEEN AN INCREASE IN THE PATIENT’S RESPIRATORY DISTRESS e.g. breathlessness, strider, cyanosis or wheezing.

No

IS THE NG TUBE VISIBLE IN THE MOUTH?

No

ACTION B. IF NO CHANGE, DOCUMENT RESULTS AND CONTINUE TO USE THE TUBE - if unsure, consult a sememore experienced member of staff. Document decision and rationale.

ACTION C. REPOSITION TUBE OR REMOVE AND REPLACE - repeat confirmation checks as seen in algorithm!

Yes

INCONCLUSIVE ASPIRATE (pH GREATER THAN 5.5) - COMBINE THE FOLLOWING WITH TUBE DISPLACEMENT CHECKS.

ACTION A.
FLUSH A SMALL AMOUNT OF AIR THROUGH THE TUBE TO CLEAR RESIDUAL FEED/FLUID THEN RETRY

ACTION B.
CONSIDER THE VOLUME OF ASPIRATE: LARGE VOLUMES SUGGEST GASTRIC PLACEMENT.
CAUTION: There have been reported high volumes of aspires from tubes that have been located in the lungs. Request senior input.
CONSIDER THE COLOUR OF ASPIRATE: YELLOW/YELLOW-GREEN/DARK GREEN ASPIRATE IS SUSPECTIVE OF BILE.
CAUTION: Lug aspirates have been described as the above colours. Look at previous pH readings, if consistently high, treat as normal, if a one off, consider why. Request senior input.

ACTION C.
MEDICATION: IF ON A PPI e.g. LANSPORT/OMEPRAZOLE OR H2 ANTAGONIST e.g. RANITIDINE.
Look at previous pH readings, if consistently high, treat as normal, if a one off, consider why. Request senior input.

ACTION D.
CONSIDER DILUTION OF GASTRIC ACID.
1. RECENT FEED/FLUSH: WAIT HALF AN HOUR AND RETRY.
2. CONTINUOUS FEEDS: CONSIDER STOPPING THE FEED FOR HALF AN HOUR.
CAUTION: If the patient is having insulin infusions for tight glycaemic control. Consult with senior doctor/specialist before stopping the feed.

ACTION E.
IF REMAIN UNSURE AFTER THE ABOVE, CONSIDER X-RAY.
Consult a senior/more experienced member of staff prior to requesting an X-ray. Document decision and rationale.
Appendix 10: Tube positioning trouble shooting pictorial guide

Trouble shooting

Tube positioning
- Common problems and their solutions

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air but no aspirate may mean…</td>
<td>Try inserting tube slightly further and then aspirating</td>
</tr>
<tr>
<td>Cannot obtain air or aspirate may mean…</td>
<td>Try putting the tube back slightly and then aspirating</td>
</tr>
<tr>
<td>Tube occluded on mucosa…</td>
<td>Inject 10ml of air down the tube and then try aspirating</td>
</tr>
<tr>
<td>Not much fluid in the stomach…</td>
<td>Try placing patient in left lateral position to ensure the tube falls towards any stomach contents</td>
</tr>
</tbody>
</table>
Appendix 11. Guideline Mobile Summary
Summary guidance published separately – available via Document Library (search for “nasogastric tube” or click here)