

Nursing Guidelines for Checking the Position of Nasogastric Feeding Tubes in Adults & Children (excludes neonates)

1.0 Introduction

This document is designed to provide guidance to qualified nurses caring for patients with nasogastric feeding tubes. It covers safe methods for checking the position of nasogastric feeding tubes and advises on unsafe methods, which should not be used. It is applicable to both adults and children but excludes neonates.

Nasogastric tube feeding is active nutritional support commonly used for maintaining or improving the nutritional status of patients who are unable to take sufficient nutrition orally. (Stroud et al 2003).

Displacement of tubes has serious implications if undetected. Incorrectly positioned tubes leave patients vulnerable to the risks of regurgitation and respiratory aspiration, which in some cases can be fatal (NPSA 2005). It is the responsibility of the qualified nurse looking after the patient to ensure that the nasogastric feeding tube (NGT) is correctly positioned, both on initial insertion and during subsequent use. The qualified nurse should undertake a daily risk assessment and discuss this with appropriate medical staff if there is any cause for concern.

2.0 Unsafe methods of testing which MUST NOT be used

There are a number of methods of testing to confirm NGT position, which have been widely used in the past, and which now MUST NOT be used. These unsafe methods are listed at Appendix I.

3.0 Safe methods for testing correct placement

Following initial insertion and on subsequent testing, there are two reliable methods for checking that the nasogastric feeding tube is correctly positioned; testing pH aspirate and X-ray (Metheny 2001, Metheny 1989).

3.1 pH testing

If fluid can be aspirated from the feeding tube following initial insertion and during subsequent use, then the pH can be tested effectively using pH indicator strips or pH paper (Stroud 2003). If the aspirate has a pH of 5.5 or less then the test paper strongly suggests a gastric placement and feeding through the nasogastric feeding tube can be commenced (NPSA 2005, Metheny 2001).

There are some limitations to the testing for gastric pH. Stomach pH can be affected by medications particularly proton pump inhibitors (e.g. Omeprazole, Lansoprazole, Pantoprazole) and H₂ receptor antagonists (e.g. Cimetidine, Ranitidine, Nizatidine) or by dilution of gastric acid by feed.

Please Note:

Adult patients - if unable to obtain an aspirate or the aspirate is higher than 5.5 on initial insertion, an X-ray MUST be obtained to confirm position

Paediatric patients- if unable to obtain an aspirate consider changing the child's position, check mouth to see if coiled up, offer drink if possible, adjust position of tube either in or out and instill 1-3mls air to expel any blockage such as stomach wall or debris, or replace the tube. If concerns with the correct position of tube continue, discuss with relevant medical staff.

3.2 X-ray

X-ray is an accurate and reliable method for confirming tube position. However there have been multiple reports of x-rays being misinterpreted by physicians (NPSA 2005). Other limitations to recurrent use of x-ray include over exposure to radiation, loss of feeding time and increased handling of often seriously ill patients (Metheny 1990). It must also be remembered that an x-ray only confirms tube position at the time of x-ray. The tube can become displaced at any time. Although the use of x-ray is advocated in patients who are at risk of inadvertent placement into the respiratory tract, it should not be used 'routinely' to check tube position (NPSA 2005, Metheny 1990, Stroud 2003).

4.0 When tube position should be checked with pH indicator paper:

- Following initial insertion.
- Daily thereafter.

If continuous pump feeding and there is a rest period, checking pH should be done prior to recommencing feed.

If the patient is on a 24 hour feed, the feed will have to be stopped for an hour prior to checking pH to allow gastric pH to fall.

Please note: This may not be relevant in critical care areas as interrupting feeds may cause concerns about unstable blood glucose or fluid balance. Medical advice should be sought in this instance. If the patient is on acid inhibiting medication then gastric aspirate should be obtained prior to giving medication.

- For Paediatric patients: check tube position prior to each use.
- Following violent coughing or vomiting episodes.
- Following evidence of tube displacement (e.g. loose tape or visible tube appears longer).
- Nasogastric tubes used only for giving medication, in the absence of feeding, are subject to the same standards of care and position checks should also be carried out daily prior to the administration of medication.

Please note: A flow chart is available (see Appendix II) to provide some guidance to qualified nurses when aspirating NGT's in order to check pH.

5.0 Measuring NGT internal length

Following initial insertion the internal length of tube (noting markings on the NGT nearest to the patients nostril) should be recorded in appropriate nursing or medical documentation. Thereafter it can be referred to when assessing tube position (Wallace 2002).

It is possible for the tip of the tube to displace upwards into the oesophagus, increasing the risk of aspiration, even if the external length appears

unchanged (NNNG 2004). Removal and replacement of the tube may be necessary if this is suspected.

If the NGT is correctly positioned on initial insertion, displacement from the stomach into the lung is extremely unlikely (NNNG 2004).

6.0 Documenting position checks

The qualified nurse should record the following:

- Length of tube if initial insertion & daily on subsequent use.
- Method of checking NGT position on initial insertion & on subsequent use.
- pH of aspirate obtained.
- Action taken and rationale.

All this information should to be documented appropriately. It can either be recorded in a 'Nasogastric Feeding tube position chart' (see Appendix III) or in existing Trust nursing documentation.

A 'Checklist & Plan of Intervention' is available (see Appendix IV) and may be carried out by the qualified nurse prior to the commencement of feeding via a NGT. The Checklist can be used as a tool to assist qualified nurses in identifying specific risk factors for NGT displacement for each patient. The Plan of Intervention suggests actions which could be taken to minimize the risk of tube displacement and to promote correct NGT position checks. The Checklist may also be useful in assisting clinical judgement when balancing the potential risks of nasogastric feeding against the need to feed (NPSA 2005)

7.0 Problems obtaining aspirate

Aspirating fluid from the tubes can be problematic. Some useful advice is as follows:

- Use the correct sized, purple-coloured oral/enteral polyurethane syringe as advised by the NGT manufacturer (50ml syringes for Merck Corflo NGTs). Use a syringe & NGT with non luer lock connections (DoH 2004)
- Inject air (10-20mls for adults, 1-3mls infants and children depending on size, but medical condition needs to be taken in to account, may not be appropriate, ie abdominal surgery) down the NGT prior to attempting to aspirate. This will clear any debris from the end of the tube and dislodge the tip of the NGT if imbedded in the gastric mucosa.
- If safe to do so ask the patient to drink some water then try again to aspirate.
- Change the position of the patient in order to move the fluid level in the stomach e.g. if sitting up, turn the patient onto the left side which will allow the tip of the tube to enter the gastric pool.
- If possible advance the tube (10-20cm in an adult, 1-2cm in infants and children). This may allow the NGT to pass into the stomach if it has been in the oesophagus.

- If the patient is alert and has an intact swallow ask them to drink an easily identifiable coloured fluid and aspirate back from the tube. If you get the coloured fluid back then the NGT is in the stomach.

8.0 Problems getting a pH of 5.5 or less

The aspirate obtained may have a high pH if the NGT has been misplaced into the lungs on initial insertion or become displaced at a later stage either into the intestine or the lung (pH >6.0).

However, the pH of gastric fluid may also be elevated due to acid inhibiting drugs or due to the presence of enteral feed in the stomach. Where patients are receiving acid inhibiting drugs a pH of 5 or less has still been found in the majority of cases (NNNG 2004). It is recommended, however, that aspiration be done as long as possible after giving medication to reduce the possible effect of drugs on gastric pH.

The most likely reason for an elevated pH is the dilution of gastric acid by enteral feed. Waiting for up to an hour will allow time for the stomach to empty and the pH to fall. If there is any doubt about the position of the tube and/or the pH of the aspirate then feeding should not be commenced and senior advice should be sought.

In the interest of improving patient safety staff are requested to report any incidents involving displacement of NGT's to the Trust Clinical Governance and Risk Department.

APPENDIX I

Unsafe methods of testing for checking NGT position, which MUST NOT be used

'Whoosh test'

The auscultation of air into the feeding tube or 'whoosh test' has often been used in the past to ascertain correct tube position. There are however reports on the ineffectiveness of this method (Metheny et al 1990, Metheny 1998, Neumann et al 1995). Cases have been highlighted where results indicated correct tube placement and feeds were started with disastrous results (NPSA 2005, Metheny 1998).

Litmus paper

Until relatively recently, it was common practice to identify position of NGT by testing gastric aspirate with Litmus paper. However, this practice is not recommended as litmus paper cannot indicate degree of acidity. It is not sensitive enough to reliably distinguish between gastric acid (pH 3-5) and bronchial secretions (pH >6) (NPSA 2005, MHRA 2004, Rollins 1997).

Absence of respiratory distress

Observing for signs of respiratory distress is often ineffective in detecting a misplaced tube (Rassias et al 1998, Metheny et al 1990). This is made even less effective with the widespread use of fine bore tubes which can enter the respiratory tract with few, if any symptoms. If the patient is unconscious, even larger bore tubes can enter the respiratory tract without showing symptoms (Torrington & Bowman 1981)

Bubbling at the end of the tube

Placing the proximal end of the tube under water and observing for bubbling is unreliable. The stomach also contains air and could falsely indicate respiratory placement resulting in the unnecessary removal of correctly positioned tubes (Metheny et al 1990)

Appearance of aspirate

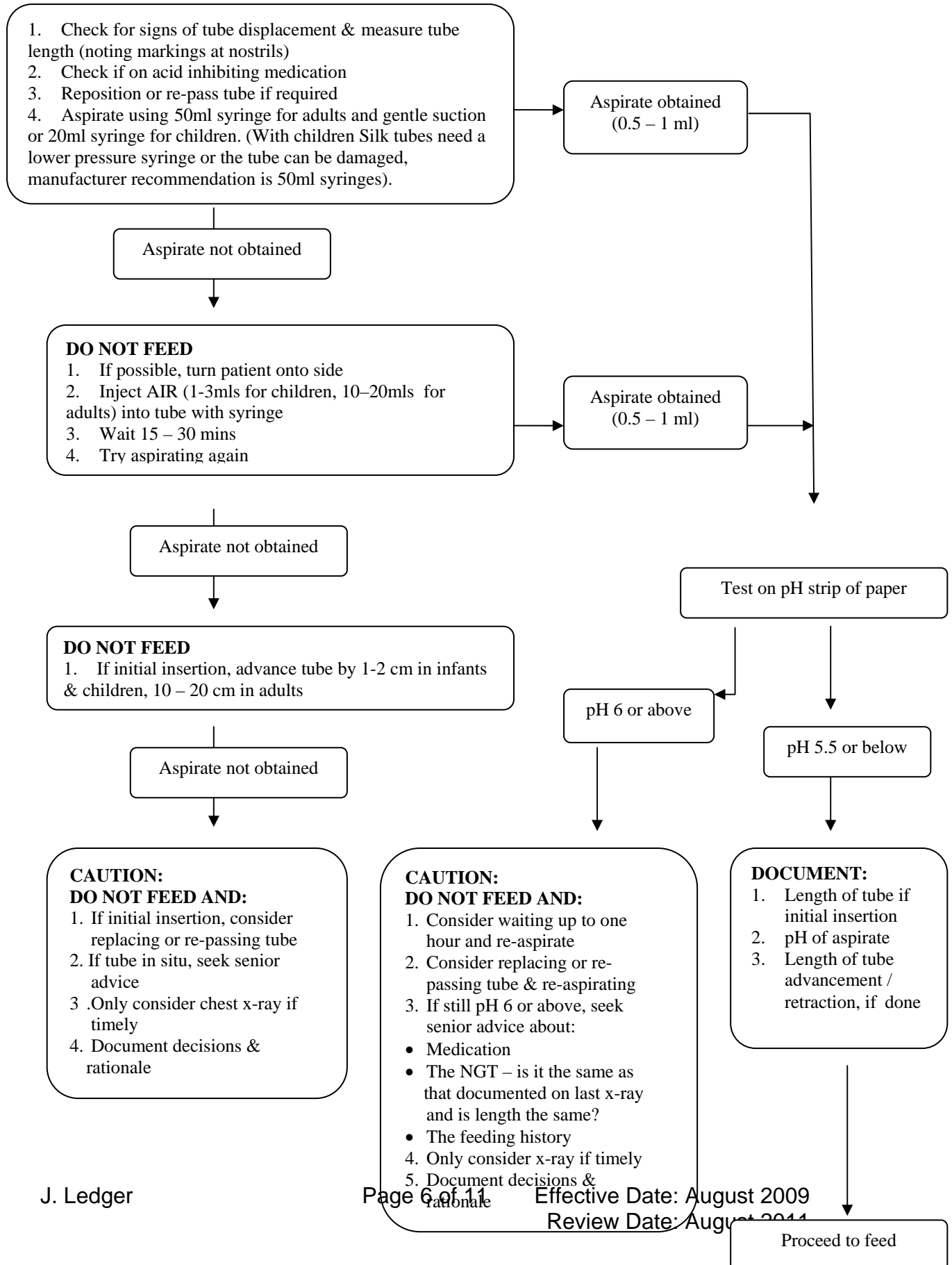
Evidence indicates that relying on the appearance of feeding tube aspirate to rule out misplacement is unreliable as gastric contents can look similar to respiratory secretions (NPSA 2005).

Signs of tube displacement

It is possible for the tube to displace upwards into the oesophagus, increasing the risk of aspiration, even if the external length appears unchanged (NNNG 2004). Removal and replacement of the tube may be necessary in this situation.

APPENDIX II

The Newcastle Hospitals NHS Trust Confirming the correct position of Nasogastric feeding tubes in ADULTS & CHILDREN



APPENDIX III

Newcastle Hospitals NHS Trust

Nasogastric Feeding Tube Position Chart

Patient details Initials: Ward: Hospital number:

Feeding tube:

Type & size of tube:

Date of insertion:/...../.....

External marking on tube (next to nostril):cm

Method used to confirm position

On insertion of tube: *pH testing of aspirate / chest x ray/
 direct vision
 (*circle as appropriate)

pH following initial insertion:

Position checks: Daily or if any change in patient condition

Date:															
Time:															
pH of Aspirate:															
External marking(cm) on tube															
NGT taped securely?															
Nurse's signature															

When obtaining aspirate for pH, flow chart may be used for guidance.
 If unable to get aspirate or if pH greater than 5.5, senior advice should be sought and a risk assessment done.

APPENDIX IV

The Newcastle Hospitals NHS Trust **Nasogastric feeding tube: Checklist & Plan of Intervention** (To reduce the risks associated with displaced NGT tubes)

Checklist

Risk Factor	YES	NO
History of vomiting or coughing Has the patient had episodes of vomiting or coughing in last 1-2 days? If so document when and how frequently		
Elevated pH Does the patient have an elevated pH (greater than 5.5) on initial NGT insertion or consistently after insertion? Is the patient taking acid inhibiting medication? e.g. Omeprazole, Lanzoprazole, Cimetidine, Ranitidine		
No Aspirate Are you consistently unable to get any aspirate from the NGT?		
Mental State Is the patient confused or disorientated? Has the patient a history of pulling out lines & tubes in the last 1-2 days?		
Feeding regime Are there any associated risks with prescribed feeding regime that need to be considered?		
Conscious level Does the patient have an altered state of consciousness (GCS <15) Is the patient sedated and/or intubated?		
Mobility Is the patient immobile and/or unable to position themselves independently in bed or chair		

Plan of Intervention

For each of the risk factors, where you have responded 'yes' on the NGT checklist, consider the following interventions listed.

History of Vomiting or Coughing

1. Where possible, ensure that a nurse is with the patient during vomiting episodes.
2. Check tube position markings & fixation tape for signs of displacement following vomiting episodes.
3. Stop the feed & check the pH of aspirate if there is any cause for concern regarding nasogastric tube position.
4. Where possible, nurse in an easily observable area on the ward.
5. If vomiting, consider regular anti emetic medication and review its effectiveness.
6. Review possible causes of vomiting or coughing with medical staff.

7. Review feeding regime with dietician to identify best feeding regime for your patient.

Elevated pH

1. Document the pH of aspirate following initial insertion.
2. Measure and document the pH of aspirate daily thereafter.
3. If the patient is on medication that will elevate the gastric pH, consider when the optimum time to administer medication might be.
4. If the pH may be elevated by the enteral feed, consider when the optimum time to check pH would be (see Trust Procedure for Checking the Position of Nasogastric Feeding Tubes)
5. If pH consistently elevated, despite the above interventions, consider other signs of tube displacement and seek senior advice on risk assessment.
6. Document all decisions and rationale.

No Aspirate

1. Use the correct size syringe as advised by manufacturer (50ml if Merck Corflo tubes).
2. Put air down tube prior to aspirating (10-20mls air in adults, and 1-5mls air in infants & children) to clear debris from end of tube and dislodge end of tube if imbedded in the gastric mucosa.
3. If safe to do ask patient to drink some water then try again.
4. Change patient position to move fluid level in stomach. If sitting up turn on to left side which will allow tip of tube to enter the gastric pool.
5. If possible, advance the tube (10-20cm in adults, 1-2cm in infants and children) which may allow it to pass into the stomach if it is in the oesophagus.
6. If the patient is alert and it is safe to do so, ask them to drink an easily identifiable coloured fluid and aspirate back. If you get the coloured fluid back then tube is in the stomach. Document this method of testing tube position in the nursing or medical notes.

Mental State

1. Where possible, nurse in an easily observable area of the ward.
2. Ensure that a nurse is with the patient at certain times, please specify.
3. Regularly check that the NGT is correctly positioned, checking tube markings and fixation tape. Consider and agree with the multidisciplinary team the appropriate level of observation required. Request extra staff to meet this need if necessary.
4. Encourage family and friends to visit to be with the patient.
5. Where possible allocate the same nurse to care for the patient.

Conscious level

1. To reduce the risk of aspiration in unconscious patients, where possible, patients should be propped up at 30° or more when feeding.
2. Ensure that the patient remains propped up for at least 30 minutes after feeding has stopped.

3. Aspirate NGT every 4 hours. If gastric residue accumulates and 4 hourly aspirates are greater than 200mls, review feeding regime with dietician.
4. Review the need for promotility drugs e.g. Metoclopramide & Erythromycin with medical staff.

Immobility

1. Where possible, ensure that the patient propped up at 30° or more during feeding.
2. Ensure that the patient remains propped up for at least 30 minutes after feeding has stopped.
3. Review feeding regime with dietician; overnight feeding may be more risky to the patient than bolus or intermittent feeding.
4. Stop the feed and check the pH if there is any cause for concern regarding NGT position

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