

## Fine Bore Nasogastric Feeding Tubes for Adults Policy

**Document Number** PD2009\_019

**Publication date** 09-Apr-2009

**Functional Sub group** Clinical/ Patient Services - Critical care  
Clinical/ Patient Services - Surgical

**Summary** This document outlines strategies to reduce risks associated with the use of a fine bore nasogastric tube in the adult patient. Descriptions of how to insert a nasogastric tube, when and how to test for placement of the tube are provided, with a flowchart outlining the steps to take when testing placement of newly inserted and in situ tubes. The strategies and processes outlined in this document are to be incorporated into health facility procedures in relation to fine bore nasogastric tubes.

**Author Branch** Quality and Safety

**Branch contact** Melissa O'Brien 9391 9569

**Applies to** Area Health Services/Chief Executive Governed Statutory Health Corporation, Board Governed Statutory Health Corporations, Affiliated Health Organisations - Non Declared, Affiliated Health Organisations - Declared, Public Hospitals

**Audience** All clinical staff

**Distributed to** Public Health System, Health Associations Unions, Health Professional Associations and Related Organisations, NSW Ambulance Service, NSW Department of Health, Public Hospitals, Private Hospitals and Day Procedure Centres, Private Nursing Homes, Tertiary Education Institutes

**Review date** 09-Apr-2014

**File No.** H09/9541

**Status** Active

### Director-General

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is **mandatory** for NSW Health and is a condition of subsidy for public health organisations.

---

## **USE OF FINE BORE NASOGASTRIC FEEDING TUBES FOR ADULTS**

### **Purpose**

To provide appropriate and safe strategies to reduce risks associated with the use of fine bore nasogastric tubes for adult patients

The strategies and process outlined in this policy are to be incorporated into health facility procedures in relation to fine bore nasogastric tubes.

### **Roles and responsibilities**

Every person has responsibility for the health and welfare of our patients. To ensure our standard and commitment are delivered, the following responsibilities are assigned:

#### **Chief Executives,**

- Assign responsibility and resources to promote the policy standard for the use of fine bore nasogastric feeding tubes.

#### **Directors of Clinical Governance**

- Promote safe fine bore nasogastric tube insertion and post insertion care
- Promote the policy for the use of fine bore nasogastric feeding tubes within health services
- Ensure successful implementation of the standard within their organisation.

#### **Director of Clinical Operations, Hospital, facility and clinical stream managers:**

- Distribute fine bore nasogastric tube insertion and placement decision support tools to all clinicians
- Provide education and training on the correct and safe insertion and removal of fine bore nasogastric tubes
- Ensure equipment such as pH indicator strips are available to ensure clinicians can assess fine bore nasogastric feeding tube placement
- Ensure that any incorrect insertion and / or placement of fine bore nasogastric tubes are discussed at appropriate patient safety and clinical review meetings

#### **Clinicians:**

- Complete education and training to ensure knowledge and practical skill for fine bore nasogastric tube insertion and care.
- Assess every patient for their increased risk of nasogastric tube complications
- Correctly insert fine bore nasogastric tubes according to the patient's risk
- Reassess fine bore nasogastric tube placement as outlined in the standard
- Document the correct insertion and placement of the fine bore nasogastric tube in the patient's health care record.

## About this standard

This document outlines strategies to reduce risks associated with the use of a fine-bore nasogastric tube in the adult patient. Descriptions of how to insert a nasogastric tube, when and how to test for placement of the tube are provided, with a flowchart outlining the steps to take when testing placement of newly inserted and in situ tubes.

The strategies and processes outlined in this document are to be incorporated into health facility procedures in relation to fine bore nasogastric tubes.

## Definition of fine bore nasogastric tubes

A fine bore nasogastric tube is a narrow bore tube passed into the stomach via the nose as a means of meeting a patient's nutritional needs when they are unable to maintain adequate oral intake.

Fine bore nasogastric tubes are long term devices that can remain insitu up to six (6) weeks and can come with or without a guide-wire.

## Scope

### Who must use this standard?

All clinical staff involved in the medical or surgical management of adults must be aware of these standards for use of nasogastric feeding tubes in adults.

### All clinical staff must -

Complete education and training to ensure knowledge and practical skill for fine bore nasogastric tube insertion and care before undertaking an insertion of fine bore nasogastric tubes.

### Patient Population –

This policy standard relates to the insertion and care of nasogastric tubes in adults only.

## Related Documents

Fine Bore Nasogastric Feeding Tubes for Paediatric Patients Policy (*in development*).

## Risks - Incorrect insertion and placement of nasogastric feeding tubes

Poor technique or using the incorrect procedure to insert or check tube placement can result in adverse patient outcomes including:

- Trauma to surrounding tissues;
- Pneumothorax;
- Aspiration associated with tube dislodgement;
- Pneumonitis from nasogastric feeds being deposited into the lungs;
- Misplacement of the tube into the lungs or rarely, in patients with cribriform plate disruption, intracranial insertion.

## POLICY STANDARD

**BE AWARE THAT....**

- ➔ Critically ill patients may be at increased risk of nasogastric tube complications e.g. patients with neurological deficits.
- ➔ Insertion a fine bore nasogastric tube into a patient with no or diminished reflexes may cause accidental insertion into other anatomical structures.
- ➔ Caution is required when inserting fine bore nasogastric tubes in patients on anticoagulants or who have impaired blood clotting.
- ➔ Caution is required when inserting fine bore nasogastric tubes in patients with a tracheostomy because of the risk in inadvertent tracheal intubation (particularly patient's with un-cuffed tracheostomy tubes).
- ➔ A fine bore nasogastric tube may cause gastric contents to leak from the stomach causing oesophageal erosions in patient with gastro-oesophageal reflux.

**DO NOT....**

- ☒ Reinsert the guide-wire after tube insertion or to advance tube at anytime.
- ☒ Refrigerate fine bore nasogastric tubes prior to insertion.

**Do not insert nasogastric tubes for patients who -**

- ☒ Have oesophageal varices or signs of long standing alcohol abuse including hepatomegaly, Wernicke-Korsakoff's syndrome, telangiectasia – patients are at higher risk of damage to the oesophageal wall causing veins to bleed uncontrollably
- ☒ Have had upper gastrointestinal stricture/obstruction – perforation of the gastrointestinal tract may occur by the tube being pushed through the walls
- ☒ Are post gastrectomy/oesophagectomy – may cause trauma to the anastomosis
- ☒ Are post oesophageal / head and neck surgery – may damage or create orifices/ fistula around surgery site. Inadvertent insertion of tube into other anatomical structures may occur
- ☒ Have severe maxillary trauma / nasal injuries / possible base of skull fractures – tube may be incorrectly inserted into other anatomical structures e.g. intracranial or tracheopulmonary. Use an orogastric tube instead.
- ☒ Have had plastics reconstruction to mouth, nose or orophagus due to changes in the anatomy
- ☒ Have a suspected spinal injury – tube normally requires hyperflexion of the neck which may lead to permanent damage

*\* In extenuating circumstances, there may be a need to perform insertion of fine bore nasogastric tube in the above conditions. In this instance only a Medical Officer experienced in the insertion of fine bore nasogastric tube may perform the procedure.*

## Strategies to reduce risk

### DO....

- ✓ Ensure that insertion of a tube is ordered by a medical officer, with the order and the rationale for insertion of the tube documented in the patient's health care record
- ✓ The patient must be assessed that they do not have a contraindication or potential complications for insertion of a fine bore nasogastric tube
- ✓ Check the patient's allergies, including allergies to Lidocaine and to tape
- ✓ Use feeding tubes that are opaque with markings to enable accurate measurement, identification and documentation of tube position
- ✓ Undertake patient observations pre and post insertion of the nasogastric tube. Observations must include temperature, pulse, blood pressure, respiratory rate and oxygen saturation; and be documented in patient's health care record
- ✓ Confirm the position of the nasogastric tube radiologically after insertion if pH is inadequate to ascertain gastric placement i.e. pH < or equal to 5.<sup>1</sup>
- ✓ Consider referring the patient to radiology for insertion of the nasogastric tube under imaging if the patient is known to have oesophageal varices, strictures or severe coagulopathy.

### TIPS

- This procedure can be uncomfortable. Consider prescribing and administering a small amount of Lidocaine gel in the nostril, and/or a spray of Lidocaine to the back of the throat.<sup>2</sup>
- For patients with a dry mouth but impaired gag reflex moisten the mouth with a moist cotton bud prior to requesting them to swallow or ask them to sniff to lift the soft palate.<sup>2</sup>

## Procedure for insertion of nasogastric tube<sup>2</sup>

1. Perform baseline observations - temperature, pulse, blood pressure, respiratory rate and oxygen saturation.
2. Read the manufacturer's instructions and gather equipment required.
3. Explain procedure and equipment to the patient.
4. Don personal protection equipment. Including non-sterile gloves, eye protection and apron / gown.
5. Preferably, sit patient upright with neck flexed for optimal neck/stomach alignment and to assist insertion.

**Note:** *Spinal and some neurological patients must be positioned according to the treating medical team instructions throughout the procedure.*

6. Examine nostrils for deformity / obstructions to determine best side for insertion. Ask the patient if they have any problems with one side of the nose more than others, e.g. sinusitis can increase irritation from the nasogastric tube.
7. Measure tubing from the tip of the nose to earlobe, then xiphisternum (point halfway between the end of the sternum and the navel). Note the cm marking on the tube at this measurement point.
8. If present, lubricate the end of the nasogastric tube as per manufacturer's guidelines (usually with water flush) and ensure guide-wire placement is locked within the tubing.
9. Lubricate the distal 5-10 cm of tube (with lubricant such as KY gel<sup>®</sup> if not self lubricating).
10. Pass tube via a nostril posteriorly and inferiorly. Ask the patient to sniff to ease passage from nose to oropharynx. Pause at this time and ensure the patient is not coughing.
11. Instruct patient to swallow and advance the tube as the patient swallows. Coincide advancement with the swallow, evidenced by elevation of the laryngeal cartilage; advance the tube into the oesophagus. For patients with intact gag reflex swallowing small sips of water or ice may enhance passage of tube into oesophagus.  
  
If resistance is met withdraw the tube 1 - 2cm and rotate it slowly with downward advancement toward closest ear. Do not force the nasogastric tube.
12. Withdraw tube immediately if the patient exhibits signs of distress, changes occur in patient's respiratory status, if tube coils in mouth, if the patient begins to cough or changes colour.
13. Advance tube until mark is reached. Tape in place at this point before the tube moves and do not remove guide-wire until the X-ray has been attended and reviewed or the tube placement has been confirmed.
14. Attach syringe or oral / enteral dispenser to the free end of the tube, aspirate sample of gastric contents (as described in flowchart below).
15. Test pH of the aspirate **using indicator strips**.
16. The pH must be **< or equal to 5**.<sup>1</sup> If pH is not < or equal to 5, obtain an X-ray to verify placement before instilling any feedings / medications, or if you have concerns about the placement of the tube.

**Note:** This test is not useful in the presence of acid suppression therapy and an X-ray must be used confirm placement.

17. Perform observations - temperature, pulse, blood pressure, respiratory rate and oxygen saturation and compare with pre-procedure observations. Notify the medical team or medical officer on call if there is significant deviation from baseline observations or if change in condition.
18. Document in patient's medical record reason for the tube insertion, nostril used, type and size of tube, the insertion distance and note the external length of the tube, the nature and amount of aspirate, and the effectiveness of the intervention. Document all observations.

## Procedure for testing position of a nasogastric tube

It is recognised that the best method of determining nasogastric tube location is provided by reliably obtained and interpreted X-ray that visualises the entire course of the tube.<sup>1,3</sup>

However, many factors, including exposure to radiation, delay in obtaining and interpreting radiographs, risk of tube misplacement while moving the patient, and the cost to the patient, contribute to the need for other reliable methods for confirming tube placement. Therefore:

### DO:

- Follow the steps set out in the attached flowchart 1.
- Use radiography to check placement of tube if pH is not < or equal to 5.<sup>1</sup>
- Test pH of aspirate using pH indicator strips. Indicator strips with 0.5 gradations or paper with a range of 0 to 6 or 1 to 11 is recommended.
- Check exit-point mark at nose for signs of any tube migration.

**NOTE:** While pH testing is helpful in evaluating tube placement on initial placement or before intermittent feeding, it's of little use with regard to continuous feeding because most tube-feeding formulas have a pH value close to 6.6 and therefore tend to neutralise gastrointestinal pH.<sup>1</sup>

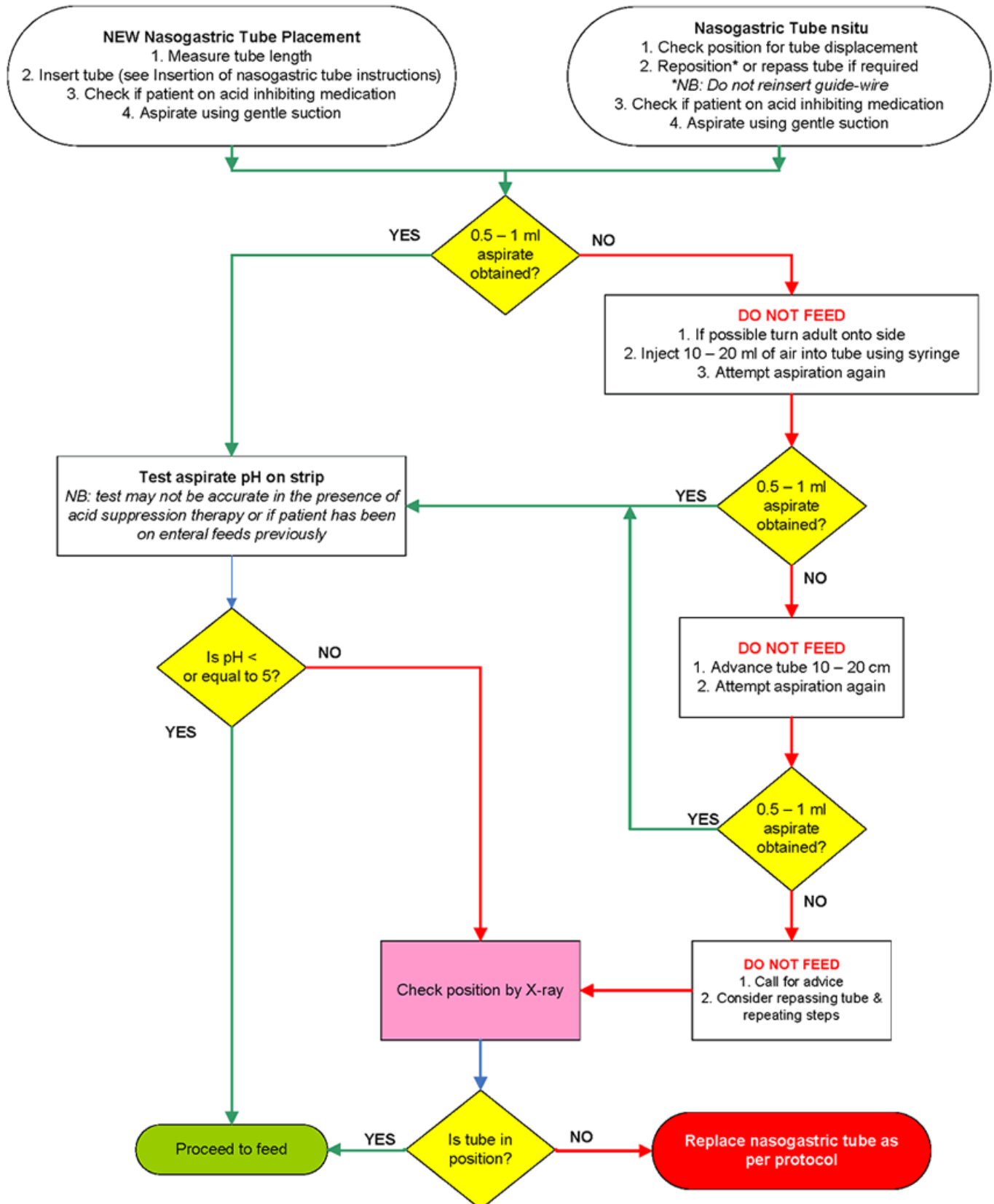
### DO NOT:

- Use auscultation of air insufflated through the feeding tube ('whoosh' test). There are many reports on the ineffectiveness of this method.<sup>3,4,5,6</sup>
- Use absence of respiratory distress as an indicator of correct positioning. Observing for signs of respiratory distress is often ineffective in detecting a misplaced tube.<sup>7,8</sup> Tubes can enter the respiratory tract without resulting in observable symptoms<sup>8</sup>, particularly if the patient is unconscious.<sup>9</sup>
- Commence feed if aspirate pH > or equal to 6 (may occur with respiratory or oesophageal placement<sup>15</sup>) or if in doubt about the position of the nasogastric tube.
- Use blue litmus paper to test the acidity/ alkalinity of aspirate. It is not sufficiently sensitive to distinguish bronchial from gastric secretions.<sup>11</sup>
- Rely on observations of bubbling at the proximal end of the tube. This method is unreliable because the stomach contains air and could falsely indicate respiratory placement.<sup>12</sup>
- Rely on the appearance of the feeding tube aspirate to rule out misplacement. This method is unreliable because gastric contents can look similar to respiratory secretions.<sup>13,14</sup>

### When to re-check the nasogastric tube position?

- Following initial insertion
- Before administering each feed and /or giving medication
- At least once per shift during continuous feeds
- Following episodes of respiratory distress vomiting, retching or coughing. Note: the absence of coughing does not rule out misplacement or migration
- If suspicion of tube displacement, e.g. poor tolerance to feed, reflux of feed into the throat, discomfort in the throat, change in tube length is suspected.
- If the patient has been transferred from one clinical area to another.

**Flowchart 1 - Procedure for testing placement of the nasogastric tube**



## Standards for Administration of Enteral Feeds / Medications via Fine Bore Nasogastric Tubes

- Fine bore nasogastric tube placement is confirmed prior to commencing and administering enteral feed or medications.
- Use equipment specified for the purpose of enteral feeding / administration of medications and complies with the manufacturer's instructions for use unless otherwise clinically contraindicated.
- Decanted feeds must not be hung for more than 10 hours.
- Patients are regularly observed for correct position of tube and tolerance of enteral feed /medications e.g. vomiting, nausea, coughing.
- If the patient has a tracheostomy or endotracheal tube insitu, check if the cuff requires inflating prior to administering enteral feed / medications
- Feeds are ceased immediately if aspiration is suspected and medical staff are notified.
- Medication and enteral feed compatibility, drug solubility and stability are confirmed by pharmacists.
- Infection control standards are maintained during preparation and administration of enteral feeds / medication.

### Removal of nasogastric tubes

1. Confirm need for removal of the nasogastric tube.
2. Explain procedure and equipment to the patient.
3. Don personal protection equipment. Including non-sterile gloves, eye protection and apron / gown
4. Position patient upright with the patient's head supported on pillows where possible

**Note:** Spinal and some neurological patients must be positioned according to the treating medical team instructions throughout the procedure

5. Turn off the feeding apparatus to decrease the risk of aspiration.
6. Spigot or cap the nasogastric tube using either the cap provided or a spigot to prevent backflow and aspiration.
7. Remove the securing tape. An adhesive remover may be required to promote patient comfort.
8. Remove the tube in a slow continuous movement to promote patient comfort and prevent trauma.
9. Dispose of equipment adhering to occupational health and safety requirements.
10. Document in the patient's medical record the reason for tube removal.
11. Observe that patient for complications or any changes in the patient's condition.

## References

- <sup>1</sup> Metheny, NA, & Titler, MG. Assessing Placement of Feeding Tubes. *AJN*, 2001;101(5):36-45.
- <sup>2</sup> Switakowski, P. and Di Milo, AM. Nasogastric Tube Insertion, University of Ottawa (2003), web page at <http://intermed.med.uottawa.ca/procedures/ng/>
- <sup>3</sup> Huffman S, Jarczyk, K.S., O'Brien, E., Pieper, P., Bayne, A., Methods to confirm feeding tube placement: application of research in practice. *Pediatric Nursing*. 2004;30(1):10-3.
- <sup>4</sup> Hendry PJ, Akyurekli Y, McIntyre R, Quarrington A, Keon WJ. Bronchopleural complications of nasogastric feeding tubes. *Crit Care Med* 1986; 14(10):892-4
- <sup>5</sup> Hand RW, Kempster M, Levy JH, Rogol PR, Spirn P. Inadvertent transbronchial insertion of narrow-bore feeding tubes into the pleural space. *JAMA* 1984; 251(18):2396-7
- <sup>6</sup> Metheny NA, Aud MA, Ignatavicius DD. Detection of improperly positioned feeding tubes. *J Healthc Risk Manag* 1998; 18(3):37-48
- <sup>7</sup> Dobranowski J, Fitzgerald JM, Baxter F, Woods D. Incorrect positioning of nasogastric feeding tubes and the development of pneumothorax. *Canadian Association of Radiologists Journal* 1992; 43(1):35-9
- <sup>8</sup> Rassias AJ, Ball PA, Corwin HL. [A prospective study of tracheopulmonary complications associated with the placement of narrowbore enteral feeding tubes](#). *Critical Care* (London) 1998; 2(1):25-8
- <sup>9</sup> Metheny N, Dettenmeier P, Hampton K, Wiersema L, Williams P. [Detection of inadvertent respiratory placement of small-bore feeding tubes: a report of 10 cases](#). *Heart Lung J Acute Crit Care* 1990; 19(6):631-8
- <sup>10</sup> Metheny NA, & Meert, KL. Monitoring feeding tube placement - a literature review. *Nutrition in Clinical Practice*. 2004; 19:487-95
- <sup>11</sup> Torrington KG, Bowman MA. [Fatal hydrothorax and empyema complicating a malpositioned nasogastric tube](#). *CHEST* 1981; 79(2):240-2
- <sup>12</sup> MHRA Notice [MHRS/MS/2004/026](#)
- <sup>13</sup> Metheny N, Dettenmeier P, Hampton K, Wiersema L, Williams P. *op cit*. Hand RW, Kempster M, Levy JH, Rogol PR, Spirn P. *op cit*.
- <sup>14</sup> Theodore AC, Frank JA, Ende J, Snider GL, Beer DJ. [Errant placement of nasoenteric tubes. A hazard in obtunded patients](#). *CHEST* 1984; 86(6):931-3
- <sup>15</sup> Metheny NA, Clouse RE, Clarke JM, Reed L, Wehrle, MA, Wiersma L. pH testing of feeding tube aspirates to determine placement. *Nutr. Clin. Prac.* 1994;9: 185 – 19

**ACTION PLANNER**

<b>ACTION PLANNER FOR:</b> Chief Executives, Health Service Executives, Managers, Directors of Clinical Governance	<b>Date:</b>
---	--------------

<b>Responsibility and personnel to implement The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy not assigned</b>	Comments/Actions:
<b>Support to line managers to mandate The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy in their areas not provided</b>	Comments/Actions:
<b>Compliance with The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy not reported to NSW Department of Health</b>	Comments/Actions:

**IMPLEMENTATION STANDARD**

	Current compliance status (✓)			Actions Required	Assigned to	Target Completion Date
	Not Started	Partially Completed	Completed			
Assign responsibility and personnel to implement The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy						
Support provided to line managers to mandate The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy standard in their areas						
Ensure equipment is available to support the implementation of The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy within clinical areas						

**COMPLIANCE STANDARD**

The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy promoted across the Health Service						
The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy is successfully implemented within organisations						
Facility wide auditing of staff hand hygiene practices as per NSW Department of Health compliance program						
The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy compliance reported to the NSW Department of Health						
Staff not complying with The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy are managed in accordance with NSW Health policy directives for staff performance management						

**LEADERSHIP STANDARD**

Facilities <ul style="list-style-type: none"> <li>• Sets The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy as an institutional standard</li> <li>• Provides routine feedback to staff on compliance with The Use of Fine Bore Nasogastric Feeding Tube for Adults Policy</li> </ul>						
---	--	--	--	--	--	--

*NB: This action planner is NOT mandatory - it is a tool to monitor the implementation of this policy*