Nasogastric tubes 1: insertion technique and confirming the correct position

Indications for nasogastric tube insertion, the procedure for inserting a nasogastric tube and how to check whether it is in the correct position

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LEARNING OBJECTIVES
1. Know the correct technique for inserting nasogastric tubes.
2. Understand the principles for verifying the correct intragastric position of a tube.

INDICATIONS
There are only two main indications for NG tube insertion – to empty the upper gastrointestinal tract or for feeding. Insertion may be for prophylactic or therapeutic reasons.

Care should be taken in cases where there may be:
- Ear, nose and throat abnormalities or infections;
- Possible strictures of the oesophagus;
- Oesophageal varices;
- Anatomical abnormalities (oesophageal diverticulae);
- Risk of aspiration.

GAINING CONSENT
Practitioners should give patients a reassuring, detailed explanation of the insertion procedure, together with the reasons why the tube is necessary. Verbal consent should then be obtained.

SIZES
Nasogastric tubes come in various sizes (8, 10, 12, 14, 16 and 18 Fr). Stiff tubes are easier to insert, and putting them in a refrigerator or filling them with saline helps to stiffen them. Some fine-bore tubes come with a guide wire to aid placement. The tube has markings and a radio-opaque marker at the tip to check its position on X-ray.

PREPARATION
After washing hands, prepare a trolley including gloves, local anaesthetic jelly or spray, a 60ml syringe, pH strip, kidney tray, sticky tape and a bag to collect secretions. Placing a glass of drinking water nearby is useful.

INSERTION TECHNIQUE
Tubes are usually inserted by nurses or junior doctors by the bedside or by anaesthetists in theatre before or during surgery. External measurement from the tip of the

INTRODUCTION
A nasogastric (NG) tube is a long polyurethane or silicone tube that is passed through the nasal passages via the oesophagus into the stomach (Fig 1). They are commonly inserted in surgical practice for various reasons.

According to the National Patient Safety Agency (2005a), 11 deaths and one case of serious harm occurred over a two-year period because NG feeding tubes had been misplaced.

Nasogastric tubes are inserted by nurses, junior doctors and sometimes by anaesthetists in theatre. It is vital that staff inserting them know the correct insertion technique as well as the procedure for verifying their correct positioning. This article reviews the indications for NG tubes and the benefits and risks associated with their use, and explains the correct method of insertion, as well as how to verify their correct intragastric positioning.

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FIG 1. NASOGASTRIC TUBE

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**ABSTRACT** Durai, R. et al (2009) Nasogastric tubes 1: insertion technique and confirming the correct position. Nursing Times; 105: 16, 12–13. This is the first in a two-part unit on nasogastric tube management. It discusses the indications, patient preparation, insertion technique and various methods of confirming the tube’s position. According to the National Patient Safety Agency, 11 deaths and one case of serious harm occurred due to misplaced nasogastric feeding tubes over a two-year period. It is therefore vital for staff inserting these tubes to know both the correct insertion methods and the procedure for verifying their correct intragastric positioning.
nose to a point halfway between the xiphoid and the umbilicus distance gives a rough idea of the required length.

The patient should sit up without any head tilt (chin up). An appropriately sized tube is chosen and the tip is lubricated by smearing aqua gel or local anaesthetic gel. Anaesthetic gel is a drug so if it is used it must be prescribed, and precautions taken such as checking for allergies.

The wider nostril is chosen and the tube slid down along the floor of the nasal cavity. Patients often gag when the tube reaches the pharynx. Asking them to swallow their saliva or a small amount of water may help to direct the tube into the oesophagus. Once in the oesophagus, it may be easy to push it down into the stomach.

The correct intragastric position is then verified (see below). The tube is fixed to the nose and forehead using adhesive tapes. The stomach is decompressed by attaching a 60ml syringe and aspirating its contents. Blocked tubes can be flushed open with saline or air.

### TABLE 1. DIFFICULTIES WHILE INSERTING NASOGASTRIC TUBES AND POSSIBLE SOLUTIONS

<table>
<thead>
<tr>
<th>Difficulty</th>
<th>Solution</th>
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<tr>
<td>Colling of the tube in throat</td>
<td>This can be avoided by using a stiff tube and passing it along the floor of the nasal cavity (Dougherty and Lister, 2008).</td>
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<tr>
<td>Coughing</td>
<td>This indicates the tube is going into the airway. Remove and reinsert it.</td>
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<td>Stressed patient</td>
<td>Ensure good explanations are given and reassure the patient.</td>
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<tr>
<td>Intubated patient</td>
<td>Use a Magill’s forceps to direct the tube from the mouth into the oesophagus. Always check its position with an X-ray.</td>
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<tr>
<td>No aspirate after insertion</td>
<td>Stomach may be empty or the tube may be in the oesophagus. Try to change its length by pushing or pulling 3–4cm.</td>
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<tr>
<td>Tube is blocked</td>
<td>Try to instil 100–200ml of saline or water to irrigate and remove food particles from the stomach.</td>
</tr>
<tr>
<td>Failure</td>
<td>A sip of water and a stiff tube may help. Try to reinsert after 30 minutes.</td>
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</table>

VERIFYING CORRECT INTRAGASTRIC POSITIONING

The intragastric position of the tube must be confirmed after its initial insertion, and this must be documented in the patient’s notes. There are two ways of confirming the tube’s position currently recommended. These are by pH test (Stock et al, 2008; NPSA, 2005a; 2005b) and X-ray. Other methods can be inaccurate and should not be used.

**pH test**

The NG tube is aspirated and the contents are checked using pH paper, not litmus paper (Earley, 2005). The NPSA (2005b) recommended that it is safe to feed patients (infants, children and adults) if the pH is 5.5 or below. This advice does not apply to neonates (preterm to 28 days). See the NPSA’s (2005b) advice and the update (2007) for more information. Note that taking proton pump inhibitors or H²-receptor antagonists may alter the pH. Similarly, intake of milk can neutralise the acid.

**Chest X-ray**

When in doubt, it is best practice to use X-ray to check the tube’s location (Stock et al, 2008). Patients who have swallowing problems, confused patients and those in ICU should all be given an X-ray to verify the tube’s intragastric position. This involves taking a chest X-ray including the upper half of the abdomen. The tip of the tube can be seen as a white radio-opaque line and should be below the diaphragm on the left side.

**Syringe test**

This test is mentioned here for historic interest only. Also known as the whoosh test, it has been shown to be an unreliable method of checking tube placement, and the NPSA (2005; 2005a; 2005b) has said that it must no longer be used.

**Confirming position**

Correct intragastric positioning should be confirmed:

- Immediately after initial placement;
- Before each feed;
- Following vomiting/coughing and after observing decreased oxygen saturation;
- If the tube is accidentally dislodged or the patient complains of discomfort.

Never insert the guide wire while the nasogastric tube is in the patient.

**Advantages**

There are several advantages associated with the use of NG tubes. They will decompress the stomach by releasing air and liquid contents. This is important for those patients with ileus, intestinal and gastric outlet obstruction.

These conditions can cause vomiting, and patients are at risk of aspirating their stomach contents, which can lead to potentially lethal pneumonitis.

Nasogastric tubes may also be useful for feeding patients who have dysphagia, for example after experiencing a stroke, and also for those who have undergone a tracheostomy.

Nasojejunal tubes are longer versions of NG tubes. They are inserted under endoscopic guidance to lie further in the jejunum and may be useful in feeding patients with pancreatitis.

- Part 2 of this unit, to be published next week, looks at complications and guidance on using nasogastric tubes.

REFERENCES


