

GASTROENTEROLOGY

**PRACTICAL PROCEDURES**

Nasogastric tube insertion 2: placement in adult patients

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## Series

This is the second of two articles on nasogastric tube insertion, which explains the procedure for adults. This is a Self-assessment article and comes with [a self-assessment test](#)

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### Abstract

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This second article on nasogastric tube insertion outlines the procedure for adults. It looks at reasons for insertion, ethical and cultural issues, and consent. It describes the correct positioning and preparation of patients and how to place the tube. Placement of the tube comes with great risk and has been linked to serious incident reporting, so nurses must demonstrate competence in practice and display awareness of the complications associated with this skill.

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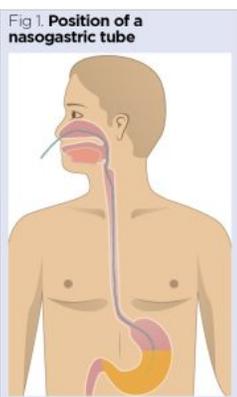
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## Introduction

Fine-bore nasogastric (NG) tubes are passed through the nasal cavity, down the oesophagus and into the stomach (Fig 1). Commonly made of polyurethane or silicone, NG tubes for adults are often indicated to administer medication, fluid or nutritional support via enteral tube feeding when oral intake is inadequate or unavailable. Such circumstances apply to people with:

- Unsafe swallow due to a [stroke](#) or a degenerative muscular condition;
- Risk of aspiration [pneumonia](#) due to a chronic health condition, such as [chronic obstructive pulmonary disease](#);
- Inability to manage nutritional needs orally due to acute illness;
- A learning disability that results in unsafe swallow and inability to manage adequate oral nutrition, such as [Down's syndrome](#).
- Decreased level of consciousness, for example patients needing sedation in an intensive care unit environment;
- Need for supplemental nutrition, such as people with [eating disorders](#) like anorexia nervosa or bulimia.



NG tubes are typically used as a short- or medium-term method of feeding. If a patient needs longer term nutritional support, a more-permanent solution may be required such as insertion of a percutaneous gastrostomy, depending on specialist advice (NHS Improvement, 2016a).

The Nursing and Midwifery Council (NMC) (2018a) states that NG tube insertion and management is something registered nurses must be able to

perform effectively to provide safe, evidence-based care to their patients. As the procedure can present a significant risk to patient safety, nurses must maintain competence and always follow local policies and guidelines when undertaking it.

Between September 2011 and March 2016, 95 incidents were reported in which fluids or medication were introduced into the [respiratory](#) tract or pleura via a misplaced NG or orogastric tube (NHS Improvement, 2016b). In recognition of this serious preventable risk, misplaced NG or orogastric tubes remain on NHS Improvement's (2021) list of 'never events'.

#### Ethical and cultural considerations

Before passing an NG tube, give patients a detailed explanation of the procedure, including information on insertion and the rationale for treatment. This ensures valid, voluntary and informed consent can be obtained. Schwartz (2018) suggested considering the following when providing nutritional support:

- Autonomy – acknowledging the patient's right to make decisions;
- Beneficence – seeking good outcomes;
- Non-maleficence – do no harm;
- Justice and fair treatment.

Consent for treatment in England and Wales is advised by the Mental Capacity Act 2005; to apply it in practice, refer to the Department for Constitutional Affairs' (2007) *Mental Capacity Act 2005: Code of Practice*. Practice in Scotland and Northern Ireland is advised by region-specific acts. Consent for NG insertion can be obtained orally, but inferred consent should not be applied when considering NG placement. If patients cannot consent for themselves, health practitioners may refer to a living care directive or take advice from family members with lasting power of attorney (LPA) for health and welfare.

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NG placement is commonly used in the management of conditions such as [anorexia nervosa](#) or bulimia. Ambivalence towards care is often shown by individuals with eating disorders, specifically as care often results from the persuasion of family members or caregivers (Broomfield et al, 2017; Guarda et al, 2007). Forced interventions are ethically and clinically justified when decision-making capacity is impaired and the benefits outweigh the risk of harm (Lavoie and Guarda, 2021).

A health practitioner can also decide to intervene to give artificial [nutritional support](#) to a patient requiring emergency care or life-saving treatment who lacks decision-making capacity. However, it is recommended that the decision for any medical intervention is made in conjunction with family members and in line with the Mental Capacity Act 2005 (Mughal, 2014).

Schwartz et al (2021) stated that health practitioners should be mindful of cultural and religious values when offering artificial administration of [nutrition and hydration](#). When communicating with family members, it is important to consider cultural norms and expectations, and ensure family members receive adequate

decision-making education; demonstrating cultural competence is also essential to providing holistic care (Douglas et al, 2017).

When deciding whether artificially administered nutrition and hydration is in the best interests of the patient, ethical issues can arise, especially as families may expect nutritional support to be standard care for survival (Schwartz et al, 2021). In these situations, health practitioners should consider:

- What will be the person's quality of life if treatment is continued?
- How long may the person live if treatment is continued?
- Is there any chance of the person recovering?

Umrانيا et al (2021) found that patients often refused NG insertion due to psychological reasons and misconceptions of the procedure. Patient concerns and commonly cited reasons for refusal were:

- Disruption to body image;
- Inability to mix socially;
- Dependency on others for activities;
- Discomfort caused by tube placement;
- Inability to take oral solids or fluids;
- Disruption to their enjoyment of tasting food.

In many cultures, food is seen as carrying social and cultural significance. The disruption to family meals and the tasting of food can greatly reduce some patients' engagement in consenting to tube placement. Umrانيا et al (2021) suggested these issues can be addressed by providing adequate psychological assessment and counselling. Where appropriate, interpreters and visual educational resources may help address some of these concerns.

The cultural norms of the practitioner may also affect decision making, specifically around NG placement for end-of-life care and patients with dementia (Schwartz et al, 2021; Douglas et al, 2017). Lopez et al (2010) found nurses' decisions about placement of NG tubes in nursing home settings were influenced by common

factors, such as lack of knowledge, uncertainty around ethical and legal implications, and effective delivery of education to patients and family.

Where NG tubes are used to administer supplementary support for people with **learning difficulties**, health practitioners should be aware of the complexities and risks involved. Marsh (2019) reinforced the need for staff education and recommended that specialist assessments are carried out by speech and language therapists and dieticians; she emphasised that NG tubes should only be used for people with learning difficulties where it is necessary and safe for the individual. Nurses must align their practice to the NMC's (2018b) Code, ensuring they are participating in continuous education and working within their scope of practice.

In summary, before placing an NG tube, nurses should ask themselves:

- Do patients understand the procedure and have the capacity to give informed consent? Are there resources I can use to help the patient's understanding?
- If patients are unable to make the decision themselves, is there a living care directive in place or does the family hold a relevant LPA?
- Will NG tube placement provide good outcomes for the patient without causing harm?
- What additional concerns might the patient have?
- Have I received the correct education and am I competent to carry out this procedure, and am I working within local policy guidelines?
- Will the use of nutritional replacement conflict with the patient's cultural and/or religious needs, and how might I develop a regime to ensure these needs are met?

### Cautions and contraindications

NG tubes have the potential to cause harm in patients with:

- Basal skull fractures;
- Ear, nose and throat (ENT) infections and altered pathology;
- Oesophageal varices and strictures;
- Facial and ENT trauma, and recent surgery to these areas.

In these instances, consult the medical and nutritional support teams to identify the safest and most appropriate solution for nutritional support (for example, gastrostomy tube insertion).

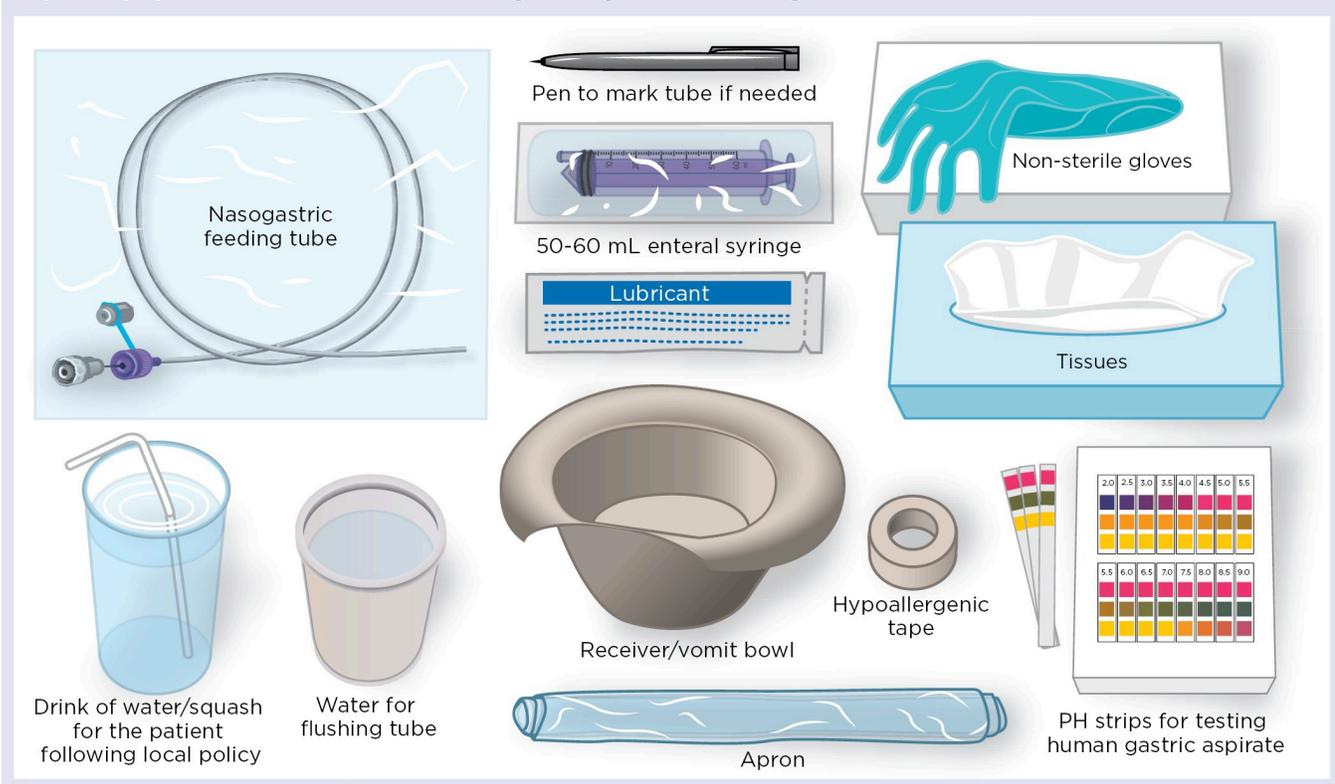
### Equipment

The following are needed for the procedure:

- NG tube – note all NG tubes used for feeding must be radiopaque and have externally visible centimetre markings (National Patient Safety Agency (NPSA), 2011);
- Personal protective equipment (PPE);
- Lubrication (water or water-soluble lubricant, depending on trust policy);
- PH paper for human aspirate, which must bear the CE mark (NPSA, 2011);
- Receiver/vomit bowl;
- Hypoallergenic fixing device/tape, depending on local policy;
- Enteral syringe (no smaller than 50ml);
- Water;
- Tissues or paper towels;
- A drink for the patient (if they have a safe swallow);
- Pen for marking measurements (optional).

Before you start the procedure, make sure all items (Fig 2) are available, and check the integrity of all equipment and expiry dates. You should also make sure you have consulted your local trust policy and guidelines for NG tube insertion, and met any local training requirements. When planning the time of insertion, check that the appropriate support – for example, access to X-rays – is available if it is needed (NPSA, 2011). Gain **informed consent** from the patient and make sure you have documented it.

Fig 2. **Equipment needed for inserting nasogastric feeding tube**



## The procedure

1. Wash hands. Help the patient to sit upright and ensure they are supported. Check they are comfortable and agree a sign should they want you to stop at any point.
2. Wash your hands and don PPE (gloves and apron, as per local policy).
3. Check guidewire (Fig 3) and ensure it can move freely in the tube.
4. Measure the tube: place the tip of it at the external nares (nostrils), extend it to the earlobe and hold it in place at this point, then extend the remaining tube to the xiphisternum – this is the nose-ear lobe-xiphisternum (NEX) measurement (Fig 4). Check the measurement or mark it with a pen. Some local policies may require adding an additional 10cm (Fan et al, 2019).
5. Give the patient tissues and a vomit bowl as the procedure may generate retching and eye watering.
6. Lubricate the tube, in line with trust policy.
7. Ask the patient which is their preferred nostril for access and visually check its patency (check for polyps, deviation of septum, etc). Ensure patency by asking the patient to occlude the opposite nostril and inhale sharply.
8. Once you have ensured the patency of the nostril, begin inserting the tube by gently feeding it along the floor of the nasal cavity (Fig 5).
9. As the tube passes the nasopharynx, giving the patient a drink of water or squash – following local protocol and if the patient has a safe swallow – or dry swallowing (as appropriate for the patient) may aid insertion by closing the epiglottis.
10. In the event of obstruction, rotate and gently redirect the tube; if resistance, pain or trauma occurs, withdraw and consider using the other nostril.
11. When the marked measurement meets the nares, pause the insertion – the tube should now have reached its location in the stomach.
12. If appropriate, ask a colleague or the patient to hold the tube in place while you confirm placement via aspiration.
13. Open the appropriate port and use an enteral syringe that is no smaller than 50ml to prevent gastric mucosa adhesion (Boeykens et al, 2014). Draw back safely until aspirate fluid is observed in the syringe (approximately 1ml).
14. Gently deposit aspirate (1-2 drops) onto the pH strip, ensuring the whole pad is covered.
15. Having waited the time advised on the product packaging, check pH against the guide. Normal pH is around 1-5.5, but refer to local policy. Normal pH suggests the tube is unlikely to be in the lungs but cannot definitively confirm gastric placement. Remember: some gastric medications (for example, proton pump inhibitors and antacids) will lower gastric pH.
16. If you are unable to obtain aspirate, the pH is borderline, or there is any uncertainty, refer to local policy. A chest X-ray will be needed to confirm correct placement.
17. Remove guidewire once tube placement has been confirmed and secure the tube appropriately (Fig 6), using local policy guidance and checking for any allergies.
18. Nothing should be administered via the tube until the correct placement has been confirmed as above.
19. Once confirmed, flush the tube with 30ml water, or as per local policy.
20. Dispose of all waste equipment and PPE appropriately.
21. Document and record in clinical notes consent, tube length (marker) at external nares, aspirate pH, confirmation of placement and flush, and additional products inserted. It can also be useful to note additional oral intake status; this should be clearly documented on the patient's fluid balance/feeding chart.
22. Every time you need to access the tube to administer fluid, feed or medication, confirm tube placement using the aspiration technique described.

Fig 3. **Nasogastric tube showing guidewire**

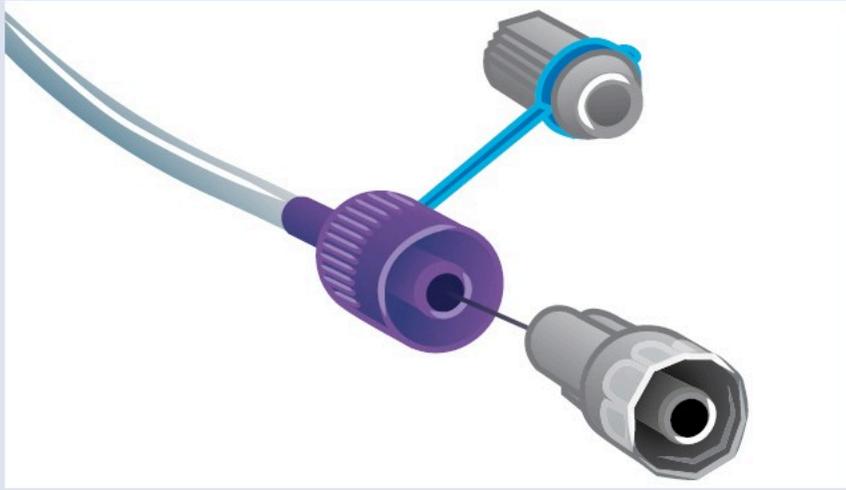
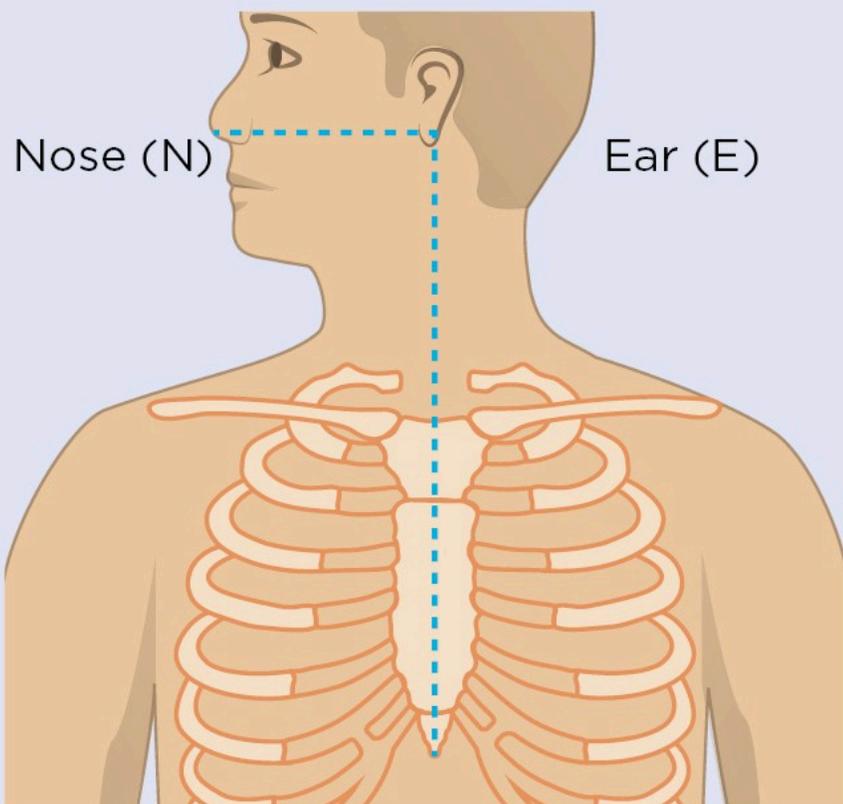


Fig 4. **NEX measurement**



Xiphisternum (X)

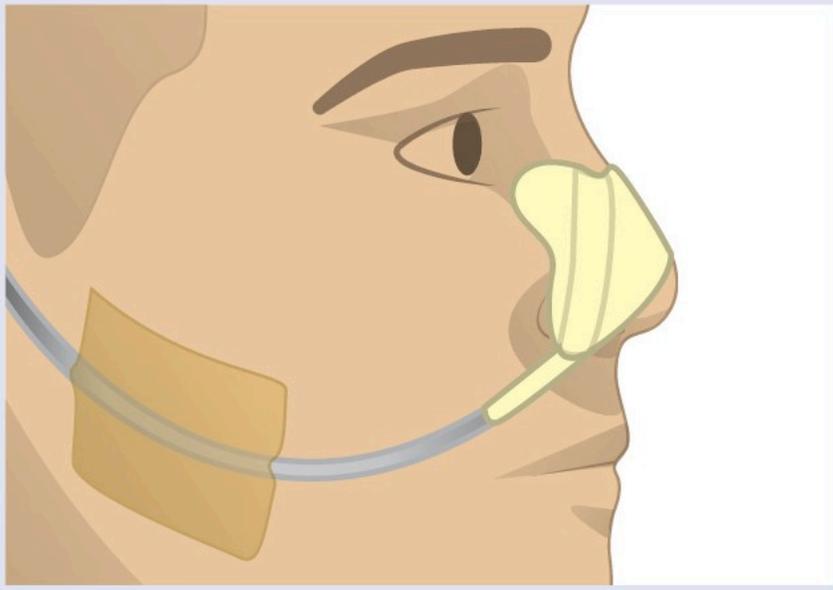
Place the tip of the nasogastric tube at the external nares (nostrils), then measure from the nose to the ear lobe and down to the tip of the xiphisternum

NEX = nose-ear lobe-xiphisternum

**Fig 5. Inserting the tube into the nasal cavity**



**Fig 6. How the tube is secured**



**Troubleshooting**

Table 1 gives an overview of potential complications and how to address them.

**Table 1. Complications during and after the procedure**

Complication	Action
Unable to obtain aspirate	Follow the National Patient Safety Agency's (nd) decision tree, including: <ul style="list-style-type: none"><li>● Turn adult onto left side if possible</li><li>● Inject 10-20ml air into the tube using a 50ml syringe – this is not for auscultation but to dislodge any obstructing debris or tube from the gastric mucosa</li><li>● Wait 15-30 minutes before aspirating again</li><li>● Advance or withdraw tube by 10-20cm</li><li>● Give mouth care to patients who are nil by mouth – this stimulates the gastric secretion of acid</li><li>● Do not use water to flush</li></ul>
Patient unable to swallow/aid insertion	Ensure the patient is in the chin-tuck position – this may help by directing the tube towards the oesophagus (Pauloski, 2008)
pH >5.5 obtained	<ul style="list-style-type: none"><li>● Do not start feed</li><li>● Consider medication chart for acid-inhibiting medications and recheck aspirate before administration</li><li>● Check position of tube via X-ray interpreted by competent clinician</li></ul>
Unable to insert tube after three attempts	<ul style="list-style-type: none"><li>● Patient may have altered anatomy</li><li>● Escalate to specialist teams to consider alternative approaches</li></ul>
Patient distressed by procedure despite support, education and explanation	<ul style="list-style-type: none"><li>● Discontinue the procedure</li><li>● Escalate to specialist teams to consider alternative approaches to management</li></ul>

### Conclusion

Passing an NG tube for nutritional/medicinal support presents several procedural, ethical and cultural considerations. Before beginning the procedure, the rationale for it and capacity to consent must be considered. The patient's cultural practices must also be taken into account to aid successful use of the device. Practitioners must make sure they follow clinical frameworks and local policy to ensure correct preparation techniques are used and appropriate equipment chosen. Reassurance should be offered to the patient throughout the procedure to give holistic patient-centred care and ensure the tube is placed successfully.

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## Professional responsibilities

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This procedure should be undertaken only after approved training, supervised practice and competency assessment, and carried out in accordance with local policies and protocols.



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