Selection, insertion and ongoing safe use of nasogastric (NG) tubes in adults with the CORTRAK Enteral Access System (EAS)
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INTRODUCTION

This training programme has been developed to enable healthcare professionals (HCP) who currently place enteral feeding tubes at the bedside, to receive full training on the CORTRAK system. The training programme consists of three stages:

1. Pre-training online assessment.
2. Two hour classroom training session.
3. Observed clinical practice, consisting of a minimum of three CORTRAK placements for nasogastric (NG) feeding tubes, including an initial placement under observation.

Following the classroom training session, you should feel comfortable and confident placing a feeding tube with the CORTRAK system under the supervision of your trainer.

Training programme overview

This training pack supports the development of clinical competence in the insertion and ongoing management of fine bore NG tubes utilising CORTRAK technology. It assumes trainees have a level of knowledge that has been assessed prior to attending this training session using the materials and pre-course questionnaire on the CORTRAK training website (www.cortrakuktraining.com). The pass mark for the pre-course questionnaire is 75%, which represents the minimum standard of knowledge required prior to undertaking the training.

The CORTRAK training programme consists of:

- A classroom training session lasting approximately two hours, including theory and practical:
  - A practical demonstration of NG tube insertion using CORTRAK with an anatomical model
  - Practical experience of NG tube insertion and position confirmation using an anatomical model
- Post-course knowledge assessment, in which trainees are required to achieve a 100% pass mark
- Competency assessment using an anatomical model during which trainees’ performance will be assessed against the CORTRAK competency framework
- Three observed CORTRAK NG placements at the bedside. One of the placements should be an initial tube placement. A trainer signed checklist will be completed to record your placements and logged on the CORTRAK training website

To ensure the requirements of your employer are met, CORPAK MedSystems recommend that trainees adhere to the competency requirements of your local organisation, which should include clinical practice assessments.

Trainees will receive a certificate on completion of the course. When they have received their certificate, they should complete a Royal College of Nursing (RCN) ‘framework for reflection’ form and keep it in their Continuing Professional Development folder. They should also complete the programme evaluation form that you will provide.

Course aims and objectives

By the end of this course it is expected you will be able to insert a fine bore NG tube using CORTRAK technology and will be able to provide ongoing reliability and safety checks associated with NG tube use. This will include identifying and taking appropriate action when a tube is entering the bronchus, removing and repositioning a tube.

When you have passed the pre-training assessment you will:
- Understand the anatomy of the respiratory and gastrointestinal (GI) tracts
- Appreciate the safety concerns associated with NG tube placement, specifically National Patient Safety Agency (NPSA) alert 2011
- Have an awareness of the competency framework for the insertion and positioning checking of NG tubes

At the end of the classroom session you will:
- Demonstrate the ability to safely utilise the CORTRAK machine
- Demonstrate competent insertion of an NG tube using CORTRAK technology
- Demonstrate correct identification of stomach confirmatory pH (1-5.5) using CE-marked pH testing strips (approved for confirming NG tube placement with human gastric aspirate)
- Demonstrate an awareness of criteria for x-ray assessment of NG tube position (trainees are not required to be assessed on x-ray interpretation of NG tube placement)
- Accurately document NG initial tube insertion and reconfirmation of tube position
- Complete and pass a CORTRAK competency assessment using an anatomical model
**BACKGROUND INFORMATION**

In the United Kingdom, the use of NG tubes has been associated with harm to patients resulting from tube misplacement at the time of initial positioning and during subsequent use. NHS England have identified training, competency, ongoing audit and revalidation of training to be key factors in reducing harm and never events.\(^1\)

The key to reducing harm is the competency of the HCP responsible for NG tube placement and ongoing management:

> *Any individual involved with NG tube positioning has been assessed as competent through theoretical and practical learning.*\(^1\)

Defining standards for the process of selection, insertion, and ongoing safe use of NG tubes in the United Kingdom is made easier by approved Skills for Health standard CHS15 Insert and Secure Nasogastric Tubes.\(^2\)

The requirements for HCPs with respect to ensuring patient safety in relation to correct placement of NG tubes are presented in Table 1 (Appendix 1). It is recognised that multiple factors will influence HCP responsibilities, including:

1. National guidance, standards and cautions
2. Local (employer) guidance, standards and requirements
3. Manufacturer recommendations
4. Professional obligations

The CORTRAK Training Programme recognises these influences and recommends that HCPs incorporate these into their practice.

In developing this competency framework, the following considerations have been made:\(^3\)

1. The requirement for all elements of the competence framework have to be achievable, realistic and relevant
2. The means by which competency will be assessed, and the minimum standards required for competency
3. The conditions in which the competence is to be assessed (allowing for performance anxieties) and reflects the realities of clinical practice
4. The likelihood of sustained standards of care
5. The validity of the competence (it does what it is supposed to do)
6. The reliability of the assessment tool (results could be replicated regardless of trainee or assessor)
7. How to manage those who do not achieve competence

**ENTERAL FEEDING**

Enteral feeding tubes deliver nutrition directly to a patient’s stomach or small bowel, via the oesophagus. They may be used for short-term or long-term nutrition, depending on the needs of the patient. Enteral feeding tubes may also be beneficial in providing access to the GI tract for the purpose of administering gastric medications and/or evacuation of air or fluid from the GI tract (commonplace in surgical or critically ill patients). Indications and contra-indications for placement of an NG tube should be based on NPSA guidelines and individual hospital protocols.

Accidental insertion of an NG feeding tube into the lungs is a potentially serious complication that may cause pneumothorax or other potential complications. This can be fatal if not recognised before infusion of enteral feed. Patients who are at increased risk of misplacement include those who are sedated, endotracheally intubated, agitated or have a weak cough.\(^4\) While the actual incidence of pulmonary misplacement is difficult to estimate, it is thought to be between 1.3% and 50%.\(^5\)

The time required to correct placement and to reposition misplaced feeding tubes may cause further delay in delivery of feed, hydration and medication for the patient.
In addition to tube misplacement at the time of initial insertion, feeding tubes can move out of the stomach at a later stage as a result of coughing or vomiting. It is important that the position of the tube is checked each time the tube is accessed. Aside from CORTRAK, there are currently two methods to confirm the correct position of NG feeding tubes; measuring the pH of aspirate or radiography; however both have their limitations. Radiography only confirms correct placement at the time of the x-ray (assuming correct interpretation of the x-ray) and there can be difficulties with gaining aspirate and achieving a pH reading between 1 and 5.5, as per NPSA guidance.¹

The NPSA 2011 Alert, reported that since the 1st September 2005, the National Reporting and Learning Systems received a further 21 reports of death and 79 reports of harm due to misplaced NG tubes causing feeding into the lungs.¹ The main cause of harm was misinterpretation of x-rays.¹ This occurred in 45 incidents, 12 of which resulted in death.¹ The NPSA therefore supports safe x-ray interpretation and the need for ongoing training, competency and audit of NG tube placement.

THE CORTRAK SYSTEM

What is CORTRAK?

The CORTRAK Enteral Access System uses an electromagnetic sensing device to track and display a representation of the path of the CORTRAK feeding tube tip during the course of the placement procedure.

How does CORTRAK work?

A unique bedside feeding tube placement system offering significant advantages over traditional placement methods, including increased accuracy of NG tube placement and enhanced patient safety.

CORTRAK allows an operator to visualise a representation of the tip of the stylet in real time during an insertion procedure. A receiver unit picks up an electromagnetic signal from the stylet tip and displays this on the monitor unit. The resulting image can be interpreted to indicate whether the tube is following the correct path, therefore avoiding insertion into the lungs or allowing correction of the direction of the tube without the need for complete removal. It allows real time visual interpretation when placing an NG tube into the stomach or accessing the pylorus for jejunal/small bowel feeding.
The component parts of the CORTRAK system interact to produce an image on the monitor (Figure 2):

- **Transmitting stylet** – The CORTRAK transmitting stylet is a braided stainless steel wire, with a transmitter coil assembly – the transmitting stylet emits an electromagnetic signal that is sensed by the receiver unit. When tube insertion is complete, the stylet is removed and may be kept for reconfirmation of placement (it is for single patient use).

- **Receiver unit** – the sensing device that detects the electromagnetic signal from the stylet tip and relays the information to the monitor unit.

- **Interconnect cable** – used to attach the CORTRAK stylet to the monitor unit.

- **CORTRAK tube** – a medical grade polyurethane enteral feeding tube with centimetre markings which may be re-passed in the same patient. The CORTRAK tubes are available in 92 cm lengths (8 fr, 10 fr and 12 fr) and 140 cm lengths (8 fr and 10 fr).

- **Monitor unit** – a real time graphic display that shows the location and path of the stylet tip relative to the receiver unit. The unit will enable you to observe two views: one anterior, and one depth cross-sectional. You can print a graphic summary of the anterior view for the patient’s records, and/or store the placement on the system for review at a later stage or for download via USB for viewing on a PC with the CORVIEW software.

- **Printer.**

**Rationale for use**

The ability to visualise the relative position and track of the stylet tip in real time during insertion provides a number of key advantages when compared with standard methods of tube placement. Similarly, the ability to visualise the CORTRAK trace upon re-insertion of the stylet is an additional safety mechanism for periodic position checks, and is unique in allowing reassurance of ongoing gastric tube placement (especially when compared with the original insertion trace and in the absence of gastric aspirates/confirmatory pH testing). This process will also reduce the patient’s exposure to unnecessary x-ray radiation and NG tube replacement.

Additionally:
- Trained operators have shown a 100% success rate in the placement of enteral feeding tubes\(^6\)\(^9\)
- CORTRAK reduces permanent tube misplacement into the lungs\(^10\)
- CORTRAK minimises time delay of tube placement and the start of feeding\(^6,7,10\)
- CORTRAK virtually eliminates the need to confirm tube placement with an x-ray, resulting in decreased patient exposure to potentially harmful radiation\(^6\)
- The record, playback and printing function allows for later review of the procedure.

See Appendix 2 for CORTRAK Insertion Standards.

**When to use CORTRAK**

CORTRAK can be used for NG or nasojejunal (NJ) insertions to confirm that the tube has been placed correctly or that it has not moved out of position after insertion.

The appropriate type of nutritional support for a patient will depend on a number of physiological factors, including expected duration of feeding, the condition and anatomy of the patient. The rationale behind the decision to use NG, NJ or parenteral nutrition is outlined in National Institute for Health and Care Excellence (NICE) guidance (Figure 3).\(^11\)

Enteral feeding is indicated for patients who are unable to eat and drink safely but have a normally functioning GI tract.\(^12\) Parenteral nutrition bypasses the digestive system entirely, and is therefore used for patients with a dysfunctional GI tract, or who have certain GI disorders. Parenteral nutrition is an invasive and relatively expensive method of nutritional support which can be associated with complications including degeneration of organs, blood clots, damage to blood vessels and increased risk of infection.\(^6,12,13\)
Figure 3. Route of feeding algorithm
Adapted from NICE Guideline CG32

ENTERAL FEEDING CONCERNS

According to NPSA guidelines\(^1\), the following risks can be associated with NG tube placement and ongoing use:

- Accidental lung placement leading to pneumothorax and other complications including respiratory distress secondary to infusion of feeds/drugs.
- Misplacement of an NG tube and subsequent feeding into the lung is considered a ‘Never Event’ and has been the subject of ongoing patient safety concerns for at least a decade.\(^1\)\(^,\)\(^4\) Recommendations to avoid Never Events can be found in Appendix 3.

However, concern has also been raised that strategies such as x-ray to avoid the adverse consequences of NG tube misplacement may be detrimental to the patient as they may delay nutrition, medication and gastric access for clearance purposes, and should be considered when deciding on how to best manage patients.

NG tube misplacement can occur at the time of initial placement, but may also occur after initial placement as a result of patient movement, vomiting or coughing. Periodic (before each use or at least daily) checks to confirm correct positioning of the NG tube are therefore required.

\(^1\) NPSA guidelines

CORTRAK Training Booklet
ANATOMY RELEVANT TO PLACING NG TUBES WITH CORTRAK

Although NG tubes are designed to access the GI tract, knowledge of related anatomical positions is necessary. Furthermore, use of the CORTRAK Enteral Access System for tube placement necessitates knowledge of surface anatomy for sensor placement. This section covers these important aspects.

- The stomach is accessed via the nose; the tube will pass posteriorly along the nasopharynx past the soft palate and epiglottis, both of which will be anterior to the path of the NG tube. From here the NG tube should bypass the larynx and trachea, entering the oesophagus (Figure 4).

- Once in the oesophagus, the NG tube will continue its path through the gastroesophageal junction, entering the stomach (Figure 5).

- Once past the nares, this journey is invisible to all, however when the tip of the tube enters the range of detection by the CORTRAK receiver unit (approximately 30 cm radius), a representation of the tip's passage can be seen on the CORTRAK Enteral Access System. It is therefore useful to know:
  - The surface landmarks of both the GI and respiratory tracts
  - The relative distances between each anatomical landmark
  - The surface landmarks denoting the lower borders of the anterior rib cage and diaphragmatic variances

Due consideration should be given to anatomical structures and landmarks during the insertion (Figure 6). Both the anterior external anatomy and the CORTRAK (anterior) view can be separated into left or right (i.e. to the left or right of the sternum) and upper and lower (i.e. above and below the xiphoid process).

The NG tube will pass as follows (in adult patients with normal anatomy):

- From the nose, into the oesophagus, past the tracheal opening. If more than approximately 30 cm away from the receiver unit you will see an ‘out of range’ message, when the tip of the stylet comes into range you will see a green dot appear as the placement progresses and a yellow line which indicates the history of the stylet tip’s journey
- Through the oesophagus, which runs adjacent to the carina, at which point the stylet tip (green dot) moves down the mid-line and towards the horizontal line on the CORTRAK anterior view screen, provided the receiver unit is in the correct position
- Through the gastroesophageal junction, at which point the stylet (green dot) will likely move below the horizontal line on the CORTRAK anterior screen
- Into the stomach, where the trace should end in the left lower quadrant on the CORTRAK anterior screen
It must be noted that from the time that the stylet comes within range of the CORTRAK receiver unit until the time that the tube passes through the gastroesophageal junction, the CORTRAK trace should be seen as a vertical line running from the top of the screen to the bottom of the screen along the mid-sagittal line of the patient.

Middle of vertebral body
Palpable vertebral spinous process

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 L1 L2 L3

Figure 6a. Example image of anterior surface, typical anatomy overlaid with CORTRAK window to show the relative positions of the GI tract in relation to the CORTRAK screen

PRACTICAL ASPECT OF TRAINING SESSION

Refer to the following information during the practical aspect of the training session, during which a CORTRAK placement will be demonstrated.

Topics covered in this section are as follows:
• Setting up the equipment
• Preparing the patient
• Insertion procedure for NG tubes
• Re-insertion of the stylet
• Troubleshooting tips

SETTING UP THE EQUIPMENT

Before the feeding tube can be inserted safely and accurately, it is important to set up the equipment correctly. See Box 1 for a list of the equipment you will need to prepare.

Box 1
CORTRAK tube
CORTRAK unit and printer
10 ml sterile water for flushing
Enteral syringe
Sterile water and bowl
Gloves
Apron
Glass of water and straw (if clinically safe and appropriate for the patient)
Tissues
CE approved pH indicator strips

Positioning and setting up the monitor
• Position the monitor unit ensuring that you have an easy view of the screen at all times and that the monitor unit is at least 60 cm from the receiver unit.
• Turn the CORTRAK monitor on by holding down the ON/OFF button and log-in to your operator account using the touch screen. This will be a test account; your own log-in and password will be set up when you are ready to perform your first clinical placement.
• Follow the screen menu to open the placement history or perform a new placement.
• If you are performing a new placement, you will need to enter your patient’s first and last name, hospital identification number and press NEXT.
• The placement screen will then present you with two real time displays – an anterior display and a depth cross-sectional display (Figure 7).
Positioning the receiver

When using the CORTRAK system it is very important to observe the position of the receiver unit on the patient.

- The receiver unit picks up the signal transmitted from the stylet tip and displays the relative tip location on the CORTRAK monitor.
- The underside of the receiver unit has 3 feet.
  - The front foot sits on the patient’s xiphoid process, the anatomical landmark for the oesophageal/gastric junction.
- The receiver unit does not need to make contact with the patient’s skin and has a range of approximately 30 cm.
- It is important that the receiver unit be reasonably level and centred along the mid-sagittal line of the patient in order to accurately represent the feeding tube tip path during placement (Figure 8).
  - If needed, use the levelling device (a wedge-like device) included with the CORTRAK Enteral Access System, to make the receiver unit level, or use the receiver unit stabiliser (a weighted belt that sits across the receiver unit) to help hold the receiver unit in place.

The equipment is now ready for use.

PREPARING THE PATIENT

- If the patient can communicate, it is important to agree upon a ‘stop signal’ that they can give if they wish to pause or stop the procedure, should they feel any discomfort or pain.
  - This need only be a simple action, such as raising their hand. It can also help to calm the patient because they gain some control over the procedure.
  - Explain the equipment and procedure to the patient; you may want to give them a copy of the CORTRAK Patient Information Booklet (available at www.cortrakuksupport.com) prior to the procedure if appropriate.

Patient position

- Assist the patient into a semi-upright position in the bed or chair. Support the patients’ head with pillows, so that it is not tilted backwards or forwards.

INSERTION PROCEDURE

- Once you have prepared the equipment and the patient, NG feeding tube insertion can begin.

Preparing the stylet

- Connect the stylet tube to the monitor unit and the interconnect cable, ensuring that the stylet is firmly in the tube and the ports are closed.
- Check that the monitor unit is close enough to the patient so that the length of the stylet will allow for full tube placement, but is at least 60 cm or more away from the receiver unit when positioned on the patient.
Inserting the stylet

The following instructions will guide you through the insertion procedure for CORTRAK NG tubes.

1. Determine the patient’s preferred nare for insertion. Ask the patient to sniff with one nare closed, and then repeat with the other nare if possible. This will help to identify any obstructions that could prevent or make intubation more difficult.

2. Dip the tube in water to activate the lubricant on the outside of the tube.

3. Insert the tube into the selected nare. Aim the tip parallel to the nasal septum and superior surface of the hard palate and allow the tube to seek its own passage towards the nasopharynx following the natural anatomy of the nose. Ask the patient to start swallowing and sipping water, unless contraindicated. If nil by mouth, dry swallowing may also assist with the passage of the tube.

4. Continue to insert the feeding tube for 5-10 cm before activating the receiver unit. To activate press the button on the receiver unit or press START on the CORTRAK monitor screen. This will bring the stylet into range of the receiver and produce a representation of the stylet’s location on the screen, indicated by a green dot (Figures 9 and 10). Expect to see an ‘out of range’ message until the stylet comes into approximately 30 cm range of the receiver unit.

5. Advance the tube down the oesophagus. The display will show a representation of the relative position of the stylet tip and the path it has taken (Figure 11). Note that the yellow line represents where the tip of the tube has been.

Top tip: For visual reference, the anterior view includes two perpendicular axis lines representing the vertical and horizontal dimensions relative to the receiver unit. Each grid contains grid marking at intervals that resemble approximately 5 cm of distance travelled by the CORTRAK transmitting stylet tip for movement realistically possible in clinical use. The grid markings offer a degree of spatial reference and aid in plot comparisons. (The CORTRAK’s design is not intended to provide an absolute positioning system but rather a relative tracking system).

Top tip: Use the increment markings on the display to check the progress of the trace and make sure it is heading in the right direction.

6. Ensure the tube does not enter the right bronchus (Figure 12a) or the left bronchus (Figure 12b). If this occurs, retract the tube until the tip is above the origin of the oesophagus and adjust the placement until a straight line is shown along the vertical axis (assuming typical anatomy). The CORTRAK Enteral Access System erases the relevant part of the displayed track when retracting the feeding tube tip along the previous insertion path.

7. Continue to progress the feeding tube down the oesophagus until it reaches the stomach. When the receiver unit is properly positioned at the xiphoid process, the horizontal axis of the anterior view represents the base of the diaphragm in patients with normal anatomy (Figure 13).
8. For a correct NG placement (in typical anatomy) the stylet should be in the bottom left quadrant (Figure 14). NG placement is now complete.

9. To end the placement, press END on the monitor screen or press the receiver unit button. The green dot will turn red to show that the placement has ended and has been saved on the monitor unit.

10. Confirm tube position per institution protocol (i.e. CORTRAK placement image, x-ray, pH etc).

11. Secure the tube at the patient’s nose with the Coverlet dressing (provided) or the CORGRIP retention device.

12. Flush the tube through the side port with 10 ml of water, to activate the internal lubricant making the removal of the stylet easier.

13. Remove the stylet (do not discard) and close the access ports of the feeding tube.

14. Disconnect the stylet from the interconnect cable but leave the interconnect cable attached to the monitor unit.

15. Log out of the CORTRAK system.

16. If desired, rinse the stylet in warm water or 70% isopropyl alcohol and retain it in the storage bag provided, or similar aerated container, and label with the patient’s ID sticker, for later use.

17. Record centimetre marking at patient’s nare in the patient’s notes.

18. Press print on the CORTRAK screen and place the printed image in the patient’s notes. The placement will automatically be saved and can be uploaded onto a USB device for viewing on a PC with the CORVIEW software.

Re-insertion of the stylet

Feeding tubes that have been initially inserted correctly can move out of the desired location at a later stage. It is important to check the placement of the tube each time feeding is initiated. This can be achieved by reinserting the stylet into the feeding tube. In addition to checking the centimetre markings printed on the feeding tube as noted in the placement procedure section.

**Top tip:** Always ask yourself – are both the journey AND the final position correct? Did the receiver unit remain in the correct position?

**Top tip:** The left quadrant of the screen is displayed as seen from the patient’s perspective. So, the bottom left quadrant will be on your right.

**Top tip:** The transmitting stylet must be handled with care at all times and discarded if the transmitting wire is broken. Wear gloves to check the stylet as handling the stylet with your bare hands may interfere with the transmission.

**Top tip:** Advance the transmitting stylet slowly. If there is any resistance, stop the procedure and remove the feeding tube and the transmitting stylet as one.

**Top tip:** To get the most accurate result always make sure that the receiver unit is in the correct position and does not move during the placement procedure.

**Patient safety**

Before re-passing the stylet, it is first important to check the integrity of the stylet and that it is still functional. The colour of the stylet mid-portion should also match the colour on the proximal connector in situ. For example, for a 92 cm feeding tube, both parts will be pink. Never use a stylet other than the one originally provided with the patient’s feeding tube.

**Top tip:** To get the most accurate result always make sure that the receiver unit is in the correct position and does not move during the placement procedure.

**Top tip:** The transmitting stylet must be handled with care at all times and discarded if the transmitting wire is broken. Wear gloves to check the stylet as handling the stylet with your bare hands may interfere with the transmission.

1. Set up the CORTRAK machine and receiver, as per the initial insertion protocol.
2. Connect the feeding tube transmitting stylet to the CORTRAK interconnect cable.
3. Lubricate the original transmitting stylet with water-soluble lubricant.
4. Pinch the tube at the patient’s nare, insert and advance the transmitting stylet until the tip can be felt at the nare. Press START on the CORTRAK screen or receiver unit.
5. Slowly advance the transmitting stylet into the feeding tube, watching the CORTRAK display for indication of tube placement. If lung placement is suspected, immediately withdraw the feeding tube AND transmitting stylet and reinsert as above.
6. If no indication of lung placement is noted, continue to slowly advance the transmitting stylet until it reaches the straight arm port of the feeding tube (where the colour portions on the transmitting stylet and the feeding tube meet and sit together). You may need to advance or retract the tube to achieve the correct positioning.
7. Confirm correct placement as described above. For a correct NG placement in patients with typical anatomy, the track should end in the bottom left quadrant.
8. End the placement on the CORTRAK screen or receiver unit. If you are happy with the journey and the end position on the CORTRAK screen.
9. Print the CORTRAK image and place it in the patient’s notes.
10. Rinse the transmitting stylet in warm water or 70% isopropyl alcohol and retain in
the storage bag provided, or a similar aerated container, and label with patient ID.

Please note that if you experience resistance during the re-insertion procedure,
then STOP, because the feeding tube may have become kinked, and may cause a
trauma if insertion is continued.

Troubleshooting tips

Top tip: If the receiver unit is dropped, there could be internal damage that is not
detectable by the system. A damaged receiver unit should be taken out of service.

Some of the most common technical problems are listed here:

Out of range
If an ‘Out of Range’ notice appears on the
CORTRAK screen, this indicates the stylet tip
is working, but is out of range of the receiver
(approximately 30 cm).

Stylet failure
The CORTRAK System will detect most failures of
the transmitting stylet and display a “Transmission
not Detected” notification to indicate a fault with
the stylet. To address this problem, reconnect and/or re-activate the stylet. If this fails, the
stylet may need to be replaced.

Receiver Unit Not Found
The ‘Receiver Unit Not Found’ notification indicates a fault in the connection
between the monitor unit and the receiver unit. If this occurs, check the connection
and try again or end the placement and confirm the tube in accordance with the
alternate institution policy. This notification may indicate a fault within the receiver unit
which may need to be replaced.

Monitor unit error during placement
If a monitor unit error occurs during a procedure, the CORTRAK unit will report this
to you with an on screen message. It will then commence a protective automatic
shutdown, to avoid any potentially harmful situations.

Erroneous screen images
If you see that the track of the tube has emerged from the side of the screen, and
moves towards the centre, this may indicate that the receiver is detecting external
interference. This may be caused by other equipment in the vicinity, an implanted
medical device or possibly that the monitor unit is too close to the receiver, so
ensure that there is at least a 60 cm gap between the device and the unit.

ONGOING USE OF NG TUBES: A PATIENT
SAFETY APPROACH

According to the NHS England, migration or displacement of the NG tube can occur after
correct initial placement. As well as presenting a safety concern, this may cause discomfort to
the patient by inducing coughing, gagging or vomiting, which may further displace the tube.
The following may cause tube migration after insertion:

• Manual displacement: the tube becomes dislodged at its securing point and the distal
portion rises up from the gastric cavity
• Accidental displacement due to coughing, vomiting or gagging
• Forward migration: this may be caused by redundant loops of NG tube moving forwards into
the duodenum

Periodic checking of the NG tube position should be performed:

• Prior to use of the NG tube to administer feed, medications or water
• If the patient has been seen to be coughing, gagging, or vomiting
• If the documented length of the tube has altered from the time of insertion
• At least daily

In accordance with best practice, confirmation of the correct positioning of an NG tube should
involve pH testing of aspirates. A confirmatory pH of 1-5.5 implies that the NG tube is safely
positioned for ongoing use. However:

• Whilst safe, the tube may not be in the optimal position for use; it may have risen up towards
the gastroesophageal junction, or forward (being very close to the pylorus)
• The patient’s pH may be altered or affected due to illness or medications and whilst the tube
may be correctly placed, the pH is therefore not valuable
• It may not be possible to aspirate fluid for pH testing

Additional methods for confirming that no tube migration has occurred may also include:

• Confirmation of tube length at nare and comparison with initial tube length. This method
alone is not reliable as it does not reflect the position of the distal end of the tube
• Examination of the quantity and quality of the fluid aspirated. This method alone is not
reliable as it may be caused by translocation of GI contents outside of the stomach (e.g.
oesophageal pouches or fistula)
• X-raying the patient can be considered an accurate means of ongoing assurance of gastric
placement, but it may not be in the patient’s best interest due to exposure to radiation, plus
the tube may move before it is accessed for feeding or medications.
• Re-insertion of the CORTRAK stylet and analysis of the repeated trace. This method
may be considered desirable particularly when coupled with pH of aspirates between
1-5.5 and confirmation of tube length at nare. It allows more precise location of the
distal portion of the tube (i.e. in the mid portion of the stomach rather than close to the
gastroesophageal junction or pyloric sphincter) and quantifiable documented clinical
evidence of tube position (which pH testing strips do not)
## ACCESS AND MAINTENANCE

Please use the table below to record the relevant information regarding access, storage and maintenance of the CORTRAK unit and add any further information appropriate to your hospital.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Answer (complete as necessary)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where is the CORTRAK unit stored?</td>
<td></td>
</tr>
<tr>
<td>Who is responsible for maintenance of the CORTRAK unit?</td>
<td></td>
</tr>
<tr>
<td>Who should be contacted if there is a problem with the unit?</td>
<td></td>
</tr>
</tbody>
</table>

## QUIZ

Take time to go through the questions below during the classroom training session.

1. **How do you activate the lubricant on the tube?**
   a. Dip the tip of the tube in aqueous gel
   b. Dip the tip of the tube in water
   c. The tip of the tube does not require lubricant
   *Explain why.*

2. **What is the approximate detection range from the receiver unit?**
   a. 30 cm
   b. 60 cm
   c. 45 cm
   *What is the significance of this?*

3. **Once placement is confirmed, what should you do immediately before removing the stylet?**
   a. Sit the patient upright
   b. Flush the tube with 10 ml of water
   c. Ensure the patient is in a left supine position
   *Why would this be important?*

4. **Where should the front foot of receiver unit be placed?**
   a. On the abdomen
   b. On and centered on xiphoid process
   c. Below the diaphragm
   d. Next to the monitor
   *If the receiver unit is in the wrong position, what would be the outcome?*
5. How far should you insert the feeding tube into the nare before initiating the CORTRAK placement?
   a. 1–5 cm
   b. 5–10 cm
   c. 10–15 cm
   d. 15–20 cm

   Why is this important?

6. What could it mean if you see that the track of the tube has emerged from the side of the placement screen, and moves towards the centre?
   a. The receiver unit has been damaged
   b. The receiver unit has been misplaced or moved
   c. The receiver unit is detecting external interference
   d. All of the above

7. If you are not confident about what you see on the screen, what should you do?
   a. Call your local representative
   b. Reposition the receiver unit
   c. Get secondary confirmation
   d. Consult with a qualified CORTRAK operator that the journey and final position are correct and if needed seek secondary confirmation

---

RE-INSERTION OF THE STYLET QUIZ

1. Why is stylet re-insertion required?
   a. Check that the CORTRAK system is still working
   b. Dislodge blockages that may have occurred during feeding
   c. Confirm that the feeding tube has not moved
   d. Straighten out any kinks that may have formed in the feeding tube

   What would this mean?

2. What must you do before re-inserting the stylet?
   a. Check that the colour of the stylet mid-portion matches the feeding tube port
   b. Give the patient a small amount of the feed to check the tube is clear
   c. Send the patient for an x-ray

3. What should you do if you experience resistance while re-inserting the stylet?
   a. Continue to pass the stylet slowly and carefully
   b. Retract the stylet, Stop the procedure and confirm by alternative hospital approved protocol
   c. Apply greater pressure to remove the kink in the tube or dislodge the blockage
   d. Ask the patient if they felt the tube move at any time since their last feed

4. The displayed path must always be in exactly the same place as the previous stylet insertion. True or false?
   a. True
   b. False

   Explain.
INTERPRETING CORTRAK IMAGES

1. Would you feed?
   
   a. YES
   b. NO
   c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

   What is your interpretation of the trace?

2. Would you feed?
   
   a. YES
   b. NO
   c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

   What is your interpretation of the trace?

3. Would you feed?
   
   a. YES
   b. NO
   c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

   What is your interpretation of the trace?

4. Would you feed?
   
   a. YES
   b. NO
   c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

   What is your interpretation of the trace?
5. Would you feed?

a. YES  
b. NO  
c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

What is your interpretation of the trace?

6. Would you feed?

a. YES  
b. NO  
c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

What is your interpretation of the trace?

7. Would you feed?

a. YES  
b. NO  
c. YES, but only if I was happy that the receiver unit stayed in position and I was happy with the journey of the trace

What is your interpretation of the trace?
**TOP TIPS**

We have gathered some top tips from existing CORTRAK users that you may find useful.

1. Make sure the receiver unit stays in the correct position throughout the procedure.
2. If the receiver unit moves during placement:
   - Maintain the tube position
   - End the placement screen by pressing the End button on the screen or pressing the button on the receiver unit
   - Open a new screen (patient details are automatically saved and will be shown on the new screen)
   - Reposition the receiver
   - Press Start, the green dot will be displayed at the position where the first screen ended (there will be no yellow history line)
   - Continue with placement
3. Monitor the entire journey of the tube to make sure no unwanted deviation of the tube from the midline occurs.
4. Always check the final tip position of the tube before feeding.
5. Ask yourself if you are confident with the entire procedure.
6. Never feed the patient if you are not happy with the trace of the tube (the journey) or the final position of the stylet tip relative to the receiver unit.
7. If you have any doubts about the procedure, double check with another CORTRAK trained operator.

8. ..................................................................................................................
9. ..................................................................................................................
10. ..................................................................................................................

**CONTINUING PROFESSIONAL DEVELOPMENT**

Please ensure that you sign the training register at the training session as this is a requirement for RCN auditing purposes.

Once you have completed the classroom training session, you should feel comfortable using CORTRAK under supervision. It is recommended that you have three placements observed within two weeks of this session; one of which must be an initial placement.

CORTRAK classroom training sessions are arranged at local level; if you feel you need to keep yourself updated, contact your trainer who will arrange this for you.

**Revalidation**

We are dedicated to continuous professional development and invite you to continue trainees’ training with CORTRAK on an annual basis. The company has set up a revalidation process for CORTRAK users. Please visit the CORTRAK training website (www.cortrakuktraining.com) to take the revalidation assessment.

For enquiries please contact: **Tel:** 0800 144 4480  **Email:** info@corpakuk.com
## PLACEMENT CHECKLISTS

<table>
<thead>
<tr>
<th>Competency</th>
<th>Evidence</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge of anatomy and physiology</td>
<td>• Demonstrated an understanding of the anatomy and physiology of the nasopharyngeal and GI tract</td>
<td>YES/NO</td>
</tr>
<tr>
<td>Rationale for procedure</td>
<td>• Demonstrates an understanding of the patient’s history to check for any potential complications</td>
<td>YES/NO</td>
</tr>
<tr>
<td>• Articulates the rationale for insertion and for the choice of tube to be inserted</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>The principles of sapsis</td>
<td>• Demonstrates correct hand washing technique</td>
<td>YES/NO</td>
</tr>
<tr>
<td>The principles of safety/risk management</td>
<td>• Verbalises the importance of asepsis</td>
<td>YES/NO</td>
</tr>
<tr>
<td>• Demonstrates the use of sterile equipment and gloves</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Identifies the elements of risk</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Verbalises the clinical incident reporting policy</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtaining consent</td>
<td>• Obtains informed consent</td>
<td>YES/NO</td>
</tr>
<tr>
<td>• Demonstrates good communication skills</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Articulates the importance of arranging a mutually agreed signal to stop the procedure</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>Preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment set up</td>
<td>• Identifies the correct equipment for the procedure</td>
<td>YES/NO</td>
</tr>
<tr>
<td>• Is aware of the importance of correct positioning of the patient</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Demonstrates the correct placement of the CORTRAK receiver on the patient</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Articulates the importance of correct placement of the receiver</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Identifies correct preparation and lubrication of the tube</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Can demonstrate input of patient data into CORTRAK accounts mode</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>Intubation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective management of NG intubation</td>
<td>• Identifies the natural anatomy of the nose and how to facilitate the passage of the tube</td>
<td>YES/NO</td>
</tr>
<tr>
<td>• Can demonstrate energising of stylet</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Can read and interpret the CORTRAK screen to identify correct and incorrect placement</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>• Can identify what to do if incorrect placement</td>
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<td></td>
</tr>
<tr>
<td>• Can identify what to do if patient shows signs of distress</td>
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<td></td>
</tr>
<tr>
<td>• Identifies how to secure the tube in place</td>
<td>YES/NO</td>
<td></td>
</tr>
<tr>
<td>Documentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documentation of procedure in patient notes</td>
<td>• Articulates the importance of clear documentation of insertion date and time</td>
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</tr>
<tr>
<td>• Demonstrates saving CORTRAK placement in account mode</td>
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<tr>
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<td></td>
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<tr>
<td>• Documents size of tube and the measurement of the visible tube from tip of the nose</td>
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</tr>
<tr>
<td>• Demonstrates accurate record keeping and is aware of the legal implications of poor documentation</td>
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<td></td>
</tr>
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<td></td>
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<tr>
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<td>Can articulate:</td>
<td>YES/NO</td>
</tr>
<tr>
<td>• The complications that can arise due to incorrect placement</td>
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</tr>
<tr>
<td>• How often position checks need to be made</td>
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<td></td>
</tr>
<tr>
<td>• Is aware of the local trust guidelines and the NPSA guidelines</td>
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<td></td>
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## CORTRAK Training Booklet
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<td></td>
</tr>
</tbody>
</table>

**REFERENCES**

5. Elett ML. What is the prevalence of feeding tube placement errors and what are the associated risk factors? Online J Knowl Synth Nurs 1997; 4:5.

CORTRAK, CORPAK logo, CORTRAK, CORTRAK logo, EAS, CORFLO, and the color YELLOW for feeding tubes are either registered trademarks or trademarks of CORPAK MedSystems, Inc. in the United States and/or other countries.
Standard Skills For Health: Insert and Secure Nasogastric Tubes

<table>
<thead>
<tr>
<th>Responsibilities of the HCP according to CHS15</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The current European and National legislation, national guidelines, professional policies and protocols in relation to inserting and securing NG tubes</td>
</tr>
<tr>
<td>2. Your responsibilities and accountability in relation to the current European and National legislation, national guidelines and professional policies and protocols in Clinical Corporate Governance</td>
</tr>
<tr>
<td>3. The duty to report any acts or omissions in care that could be detrimental to yourself, other individuals or your employer</td>
</tr>
<tr>
<td>4. The importance of applying standard precautions to inserting and securing NG tubes and the potential consequences of poor practice</td>
</tr>
<tr>
<td>5. The importance of working within your own sphere of competence when and seeking advice when faced with situations outside your sphere of competence</td>
</tr>
<tr>
<td>6. The conditions and constraints which might dictate who undertakes this procedure and why</td>
</tr>
<tr>
<td>7. What valid consent means and why it must be obtained and confirmed prior to actions being taken</td>
</tr>
<tr>
<td>8. The anatomy of the upper gastrointestinal tract in relation to inserting NG tubes</td>
</tr>
<tr>
<td>9. The physiology of the stomach and small intestine in relation to potential contents of gastric aspirate</td>
</tr>
<tr>
<td>10. The following regarding the stomach/intestinal fluid:</td>
</tr>
<tr>
<td>1. the normal appearance and content of stomach/intestinal fluid</td>
</tr>
<tr>
<td>2. potential abnormal appearance and content of stomach/intestinal fluid depending on the individual’s presenting medical condition</td>
</tr>
<tr>
<td>11. Potential sources of contamination when inserting NG tubes and appropriate measures to reduce or deal with them</td>
</tr>
<tr>
<td>12. The potential consequences of contamination of equipment and materials used for the insertion of NG tubes</td>
</tr>
<tr>
<td>13. How aseptic technique contributes to the control of infection</td>
</tr>
<tr>
<td>14. Why individuals should be supported and told about the nature of the insertion of the NG tube</td>
</tr>
<tr>
<td>15. The concerns and worries which individuals or client groups may have in relation to some clinical procedures</td>
</tr>
<tr>
<td>16. The adverse reactions which may occur during and following procedures and how to identify and deal with these</td>
</tr>
<tr>
<td>17. The importance of offering effective verbal and non-verbal support and reassurance to patients when you insert NG tubes</td>
</tr>
<tr>
<td>18. The effective method of providing verbal and non-verbal support and reassurance to patients</td>
</tr>
<tr>
<td>19. The types of NG tubes that can be used and why you should select that most appropriate for the individual</td>
</tr>
<tr>
<td>20. The topical anaesthetic agents</td>
</tr>
<tr>
<td>21. The importance of maintaining the correct level of cleanliness for the insertion of NG tubes</td>
</tr>
<tr>
<td>22. The importance of following procedures for the insertion of NG tubes exactly as specified, and the potential effects of not doing so</td>
</tr>
<tr>
<td>23. The importance of packing up used equipment and materials and covering new dressings containing NG aspirate prior to leaving the immediate care area</td>
</tr>
<tr>
<td>24. How and where to dispose of:</td>
</tr>
<tr>
<td>1. used equipment and materials</td>
</tr>
<tr>
<td>2. NG aspirate</td>
</tr>
<tr>
<td>25. The importance of immediately reporting any issues which are outside your own sphere of competence without delay to the relevant member of staff</td>
</tr>
<tr>
<td>26. The following regarding records:</td>
</tr>
<tr>
<td>1. the importance of keeping accurate and up to date records</td>
</tr>
<tr>
<td>2. the specific records required for reporting on the insertion of NG tubes</td>
</tr>
<tr>
<td>Reducing the Harm Caused by Misplaced Nasogastric Feeding Tubes in Adults, Children and Infants</td>
</tr>
</tbody>
</table>

Table 1. Standards for Ensuring Correct Placement of Nasogastric Tubes in the United Kingdom

<table>
<thead>
<tr>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Before a decision is made to insert a NG tube, an assessment is undertaken to identify if NG feeding is appropriate for the patient, and the rationale for any decisions is recorded in the patient’s medical notes.</td>
</tr>
<tr>
<td>2. Placement is delayed if there is not sufficient experienced support available to accurately confirm NG tube placement (e.g. x-ray) unless clinically urgent, and that the rationale for any decisions made is recorded in the patient’s medical notes.</td>
</tr>
<tr>
<td>3. NG tubes used for the purpose of feeding are radio-opaque throughout their length and have externally visible length markings.</td>
</tr>
<tr>
<td>4. The importance of offering effective verbal and non-verbal support and reassurance to patients when you insert NG tubes</td>
</tr>
<tr>
<td>5. X-ray is used only as a second line test when no aspirate could be obtained or pH indicator paper has failed to confirm the position of the NG tube and that:</td>
</tr>
<tr>
<td>6. Documentation of the tube placement checking process includes confirmation that any x-ray viewed was the most current x-ray for the correct patient, how placement was interpreted, and clear instructions as to required actions. Any tubes identified to be in the lung are removed immediately, whether in the x-ray department or clinical area.</td>
</tr>
<tr>
<td>7. Any individual involved with NG tube position checks has been assessed as competent through theoretical and practical learning.</td>
</tr>
<tr>
<td>8. ‘Whoosh’ tests, acid/alkaline tests using litmus paper, or interpretation of the appearance of aspirate are never used to confirm NG tube position as they are not reliable.</td>
</tr>
</tbody>
</table>

Skills

1. Apply standard precautions for infection prevention and control and take other appropriate health and safety measures |
2. Check the individual’s identity and confirm the planned activity |
3. Give the individual relevant information, support and reassurance in a manner which is sensitive to their needs and concerns |
4. Gain valid consent to insert the NG tube |
5. Select and confirm all equipment and materials for inserting the NG tube to: |
   1. be appropriate for the procedure |
   2. fit for purpose |
6. Ensure that the individual is positioned in a way that: |
   1. ensures their safety and comfort |
   2. facilitates insertion of the NG tube |
7. Insert the NG tube in compliance with the correct protocols and procedures: |
   1. at an appropriate time according to the individual’s plan of care |
   2. using appropriate techniques |
   3. using equipment in the way that the manufacturer instructs |
   4. in a manner which optimises the patient’s comfort and dignity and minimises pain and trauma |
8. Observe the individual throughout the activity, recognise and report any condition or behaviour which may signify adverse reactions to the activity and take the appropriate action |
9. Ensure the NG tube is correctly positioned in the stomach |
10. Ensure the drainage bag is securely attached in a way that prevents discomfort and promotes dignity of the individual |
11. Ensure the individual is made comfortable following insertion of the NG tube and dispose of waste according to agreed procedures |
12. Observe NG aspirate for any change in appearance and promptly inform the appropriate member of the care team |
13. Measure and record the volume of aspirate and correctly using the required documentation |
14. Seek assistance promptly from an appropriate person should it be required at any stage |
15. Dispose of waste appropriately |
16. Record clearly, accurately, and correctly any relevant information in the necessary records.
### Appendix 2 CORTRAK Insertion Standards

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide the patient with pertinent information and obtain informed consent where capacity is assured.</td>
<td>Reduces anxiety and enables the patient to make an informed choice regarding the forthcoming intervention. In the absence of mental capacity, allowing informed choice allows the best possible treatment for the patient and may reduce distress during the intervention.</td>
</tr>
<tr>
<td>Assemble the required equipment away from the bedside. Bring equipment to the bedside and prepare the CORTRAK device for use.</td>
<td>Minimises disruption and patient anxiety. Allows basic checking in smallest possible timeframe. Reduces risk of infection due to seamless uninterrupted flow.</td>
</tr>
<tr>
<td>Wash hands and put on protective garments in line with local policy (must include eye protection).</td>
<td>Reduces danger to self and others (minimises cross infection).</td>
</tr>
<tr>
<td>Ensure patient is in a suitable position for the procedure:</td>
<td>Improves the chance of successful NG tube placement.</td>
</tr>
<tr>
<td>• Semi-recumbent with head tilted forward and supported with pillows (if conscious/able) or.</td>
<td>Reduces the risk of aspiration in ventilated patients.</td>
</tr>
<tr>
<td>• Supine (head of bed elevated 30 degrees) with head tilted forward and supported with pillows if unconscious or unable to sit up.</td>
<td>Maintain cleanliness of procedure; ensures equipment is at hand and minimizes delays, enhancing patient safety.</td>
</tr>
<tr>
<td>Open paper towel on the trolley and place:</td>
<td>pH 1-5.5 indicates gastric placement.</td>
</tr>
<tr>
<td>• NG tube</td>
<td>Correct receiver unit positioning ensures accurate recording of CORTRAK tube tip pathway in relation to the patient’s anatomical landmarks.</td>
</tr>
<tr>
<td>• NG syringe</td>
<td>Ensures gastric contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Gaj duplex (with water)</td>
<td>Ensures tube easily removed once inserted.</td>
</tr>
<tr>
<td>Have pH testing strips available for use</td>
<td>NEX measurement probably not relevant but need to justify removing it as is a normal standard.</td>
</tr>
<tr>
<td>Prepare the CORTRAK machine:</td>
<td>Ensures NG tube is ready for insertion and that guidewire will be easily removed once inserted.</td>
</tr>
<tr>
<td>• Turn it on, log in and ensure battery is fully charged</td>
<td>Ensures gastric contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Enter patient details</td>
<td>Ensures tube passes freely through nasal cavity into GI tract.</td>
</tr>
<tr>
<td>• Correct position CORTRAK receiver unit</td>
<td>Maintain your safety; reduces cross infection risk.</td>
</tr>
<tr>
<td>Put on gloves and ensure personal protective equipment is secured</td>
<td>NEX measurement probability not relevant but need to justify removing.</td>
</tr>
<tr>
<td>Prepare the NG tube:</td>
<td>This is a normal standard.</td>
</tr>
<tr>
<td>• Perform nose to ear xiphoid (NEX) measurement consistent with NG tube placement</td>
<td>Ensures NG tube is ready for insertion and that guidewire will be easily removed once inserted.</td>
</tr>
<tr>
<td>• Ensure stylet is able to move freely but is fixed for insertion</td>
<td>Ensure positive contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Lubricate the NG tube tip with water</td>
<td>Ensures tube passes freely through nasal cavity into GI tract.</td>
</tr>
<tr>
<td>• Close all the ports</td>
<td>Maintain your safety; reduces cross infection risk.</td>
</tr>
<tr>
<td>• Perform nose to ear xiphoid (NEX) measurement probably not relevant but need to justify removing it as is a normal standard.</td>
<td>Ensure positive contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Place the patient in the correct nare and advance it along the floor of the nose to the nasopharynx</td>
<td>NEX measurement probably not relevant but need to justify removing it as is a normal standard.</td>
</tr>
<tr>
<td>• Occult the nare in turn and ask the patient to sniff (if appropriate)</td>
<td>Ensure positive contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Insert the NG tube into the nare which the patient says has less resistance to sniffing</td>
<td>Maintains cleanliness of procedure; ensures equipment is at hand and minimizes delays, enhancing patient safety.</td>
</tr>
<tr>
<td>• Ensure the NG tube is in the correct nare and advance it along the floor of the nose to the nasopharynx</td>
<td>NEX measurement probably not relevant but need to justify removing it as is a normal standard.</td>
</tr>
<tr>
<td>• Occult the nare in turn and ask the patient to sniff (if appropriate)</td>
<td>Ensure positive contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Insert the NG tube into the nare which the patient says has less resistance to sniffing</td>
<td>Ensure positive contents do not leak during or after insertion.</td>
</tr>
<tr>
<td>• Place the tube in the correct nare and advance it along the floor of the nose to the nasopharynx.</td>
<td>Optimize the likelihood of correct (i.e. gastric) placement of the NG tube.</td>
</tr>
<tr>
<td>• Ask the patient to swallow (this may be aided by allowing sips of water if appropriate) whilst advancing the NG tube gently forward</td>
<td>Expect to see “Out of Range” message until the stylet comes into the 30 cm range of the receiver unit, this will be indicated by a green dot.</td>
</tr>
<tr>
<td>• Tilt the patient’s head forward during this process</td>
<td>Reduces risk of trauma as a consequence of NG tube placement.</td>
</tr>
<tr>
<td>• If any resistance is felt, withdraw the tube and start again</td>
<td>Traces Oesophageal anatomy which is visualised on the CORTRAK screen.</td>
</tr>
<tr>
<td>• Continue passing the tube whilst observing the CORTRAK trace for midline travel.</td>
<td>Allows “visualisation” of the NG tube’s passage past the gapeosophageal junction and seated into the stomach (i.e. not progressing into the duodenum).</td>
</tr>
<tr>
<td>• Once the trace passes the horizontal line, observe for trace movement to the patient’s left / right (as indicated) the tube should finish in the patient’s left lower quadrant as seen on the CORTRAK device.</td>
<td>Calm for the comfort of the patient and respects their right to have some control over the procedure.</td>
</tr>
<tr>
<td>• Observe the patient for undue distress during the procedure – stop the procedure if you consider it to be detrimental to the patient’s wellbeing.</td>
<td>Allows “visualisation” of the NG tube’s passage past the gapeosophageal junction and seated into the stomach (i.e. not progressing into the duodenum).</td>
</tr>
<tr>
<td>• Press STOP on the CORTRAK device or the receiver unit</td>
<td>Optimize the likelihood of correct (i.e. gastric) placement of the NG tube.</td>
</tr>
</tbody>
</table>

### Appendix 3

According to the NPSA 2011, Recommendations to avoid Never Events:

- Before a decision is made to insert a NG tube, an assessment is undertaken to identify if NG feeding is appropriate for the patient, and the rationale for any decisions made is recorded in the patient’s medical notes.
- Placement is delayed if there is not sufficient experienced support available to accurately confirm NG tube placement (e.g. at night), unless clinically urgent, and that the rationale for any decisions made is recorded in the patient’s medical notes.
- NG tubes used for the purpose of feeding are radio-opaque through their length and have externally visible length markings.
- pH indicator paper is CE marked and intended by the manufacturer to test human gastric aspirate.
- NG tubes are not flushed, nor any liquid fed introduced through the tube following initial placement, until the tube tip is confirmed by pH testing or x-ray, to be in the stomach.
- pH testing is used as the first line test, 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.
- X-rays are used only as a second line test when no aspirate could be obtained or pH indicator paper has failed to confirm the position of the NG tube and their.
- X-ray request forms clearly state that the purpose of the x-ray is to establish the position of the NG tube for the purpose of feeding.
- The radiographer takes responsibility to ensure that the NG tube can be clearly seen on the x-ray to be used to confirm tube position.
- Documentation of the tube placement checking process includes confirmation that any x-ray viewed was the most current x-ray for the correct patient, how placement was interpreted, and clear instructions as to required actions. Any tubes identified to be in the lung are removed immediately, whether in the x-ray department or clinical area.
- Any individual involved with NG tube position checks has been assessed as competent through theoretical and practical learning.

<table>
<thead>
<tr>
<th>Security the NG tube by either manufacturer’s tape or other securement device (as indicated)</th>
<th>Ensures the NG tube is not dislodged.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attempt to aspirate the NG tube:</td>
<td>Ensures NG tube is placed within the stomach.</td>
</tr>
<tr>
<td>• pH test all aspirates:</td>
<td>Enhances patient safety by creating no doubt as to the NG tube’s suitability for use.</td>
</tr>
<tr>
<td>– If 1-5.5, confirms correct position</td>
<td></td>
</tr>
<tr>
<td>Document:</td>
<td></td>
</tr>
<tr>
<td>• Date and time of insertion</td>
<td></td>
</tr>
<tr>
<td>• Depth of tube measured at (site)</td>
<td></td>
</tr>
<tr>
<td>• Confirmation of tubes destination:</td>
<td></td>
</tr>
<tr>
<td>– By pH 1-5.5 or</td>
<td></td>
</tr>
<tr>
<td>– X-ray confirmation</td>
<td></td>
</tr>
<tr>
<td>Any special comment related to the procedure</td>
<td></td>
</tr>
<tr>
<td>Print out and attach CORTRAK placement label</td>
<td></td>
</tr>
</tbody>
</table>