

Clinical and scientific letters

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Nasogastric feeding tubes – algorithm for correct placement

The National Patient Safety Agency (NPSA) issued a mandate in 2011 that misplacement of nasogastric (NG) feeding tubes should be a ‘never event’ and that all trusts in the UK (adults and paediatrics) must adhere to this mandate by September 2011.¹ Aside from the issue of staff training and competency checking, the circumstances in which X-ray confirmation of position should be obtained have been clarified. Tube position should be confirmed by measuring the pH of the aspirate as a ‘first line’ guide and if this fails X-ray should be used.¹ Tube position should be confirmed:

- at initial placement
- before administration of feeds, fluids and medication
- following episodes of coughing, vomiting and retching, or other evidence of tube displacement.^{1,2}

At the University Hospitals Coventry and Warwickshire NHS Trust the nutrition team undertook measures to avoid such complications and to comply with the NPSA mandate. First, we analysed three different brands of tube to determine which gave the best possible radiological image for clinicians to visualise the tube and ascertain its correct position. Second, we developed a radiological protocol on our picture archiving and communication system (PACS), which included a training module as well as aiming to improve overall processes for detection of tubes.

Confirmation must be possible with the tube alone; therefore we assessed the radio-opacity of several brands of tube once

guide wires had been removed. Of note, NG tube radio-opacity quantification has been shown to vary across a range of NG tube manufacturers³ and therefore visibility of the tube and tip should be noted in determining tube position. The brand of tube that was most consistently radio-opaque was chosen for ongoing use. In addition to radio-opacity, tubes had distance markers at 1 cm intervals to enable accurate measurement and interpretation, thereby reducing misplacement risk.¹

We developed an algorithm to guide clinicians in determining correct placement of nasogastric tubes (Fig 1). Next, the trust’s PACS browser tool (Centricity PACS) was used to help identify NG tubes that were deemed challenging. The first stage is to manually adjust the contrast and brightness settings. If this failed to readily identify the NG tube the ‘region of interest (ROI) window tool’ was employed as a second line strategy (Fig 2). This is an automated function that selectively changes the

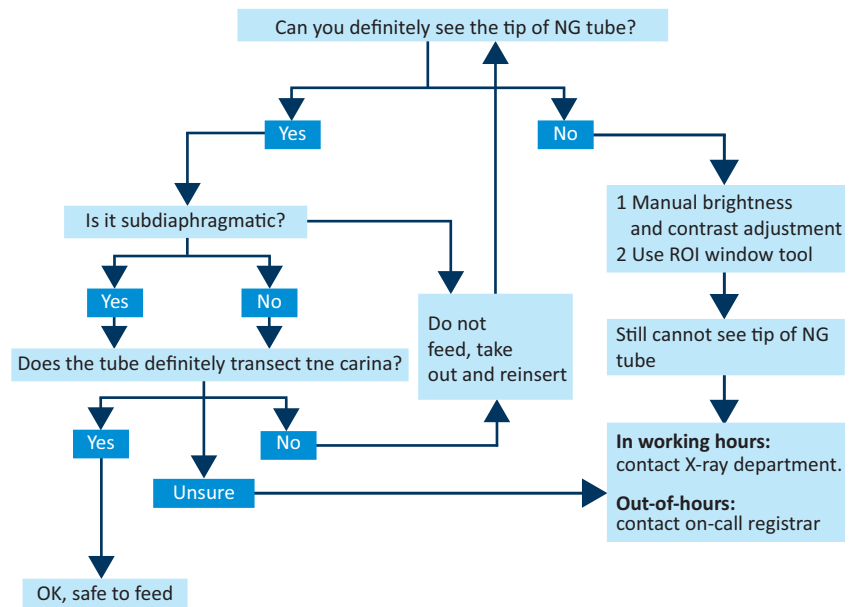


Fig 1. Algorithm to guide clinicians in determining correct placement of nasogastric tubes. NG = nasogastric; ROI = region of interest.

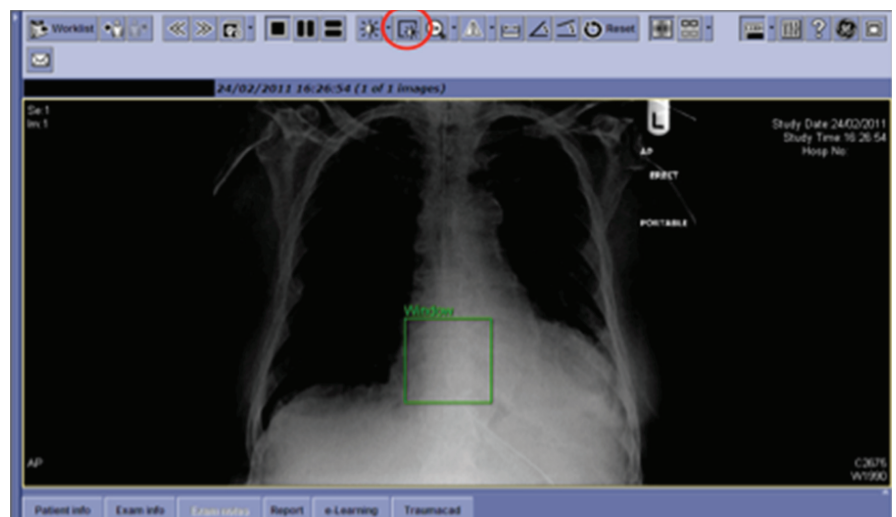


Fig 2. ROI Window tool on PACS. An algorithm (Fig 1) is used to aid clinicians in identifying the NG tub. If the NG tube tip was under the left hemidiaphragm and that NG tube bisected the carina, it could be assumed, without doubt, that the NG tube was within the stomach. NG = nasogastric; PACS = picture archiving and communications system; ROI = region of interest.

differential contrast settings within the manually drawn region. Consequently the NG tube frequently appeared much more prominent in relation to its adjacent structures and was more easily traceable.

In summary, these measures enabled us to ensure that tubes are adequately radio-opaque to X-ray and a clear protocol is in place to confirm position.

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