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Letter to Editor

Confirmation of Correct Placement of Nasogastric Tube *in Situ*

Sir,

Nasogastric or Orogastric tubes are inserted in various medical and surgical conditions for gastric decompression or enteral feeding. These tubes are inserted frequently without any complications, but may be potentially dangerous if they are misplaced during insertion or later. Complications of insertion include local trauma or irritation to the nose / nasopharynx, epistaxis, esophageal injury, endo bronchial placement (which is hard to recognize in a patient with depressed level of consciousness), sinusitis or otitis media, and unusually, even perforation of stomach (described in paediatric age group, which can be potentially fatal[1]). Administering feeds through a tube, which is inadvertently placed in the tracheo-bronchial tree can be fatal. Hence, correct tube position should be confirmed to prevent any complications.

After the insertion of the Nasogastric tube and before the administration of any medication or feeds the tube must be checked immediately, and at least once daily, in patients on continuous feeds.

The Nasogastric Tube *in Situ* positioning can be confirmed by different methods:

A). *Whoosh test*- As air is injected through the tube (1.5 cc in children and 10 to 20 cc in adults), gurgling sound can be heard by auscultation over the abdomen. (b). *Aspiration of gastric contents*- aspiration of the food particles or gastric juices from the tube indicates presence of tube in the stomach.(c). *Air bubbling* - When the external endof the feeding tube is dipped in a bowl of water, air bubbles are seen with each expiration if the tube is in the respiratory tract. (d).*Testing the pH (acidity/ alkalinity) of the gastric aspirate* : 0.5 ml to 1.0 ml of the aspirate will be sufficient to cover the reagent panels of the pH testing strips. pH indicator strips with 0.5 gradations are recommended. Colour change will occur in about 10 seconds. According to the National Patient Safety Agency (U.K.) guidelines, pH of the aspirate should be less than 5.5 before feeds can be administered[2]. Use of blue litmus paper for detecting pH changes is not reliable as it does not indicate the exact range. (e).*Colorimetric test:* A Colorimetric sensing device (pedicap) which senses CO_2 (change from purple to yellow indicates the presence of CO_2) is used to detect proper feeding tube placement. The test will be positive if the feeding tube is inadvertently placed in the tracheo-bronchial tree[3]. (f).*Capnography*: Capnography, routinely used to monitor the end tidal CO_2 in intubated patients, can be used to monitor the feeding tube placement. Even though accurate, it is difficult to perform this test outside the operating room or ICU settings. (G). *Radiography:* Either fluoroscopy or X-ray can be used for confirmation of tube position. Fluoroscopy can be used in places like catheterization laboratory whereas Chest X-ray (with upper abdomen included) is a reliable method for confirmation otherwise. X-rays should be interpreted by trained personnel. The number of X-rays should be minimized in order to avoid increased exposure to radiation. Fully radio-opaque tubes that have markings should be used. Tube position

in the left costophrenic sulcus is difficult to distinguish from intra gastric placement especially in Antero - Posterior views.

In conclusion, nasogastric or orogastric tubes, frequently inserted for various purposes, must be checked for correct placement immediately after insertion and should be reconfirmed before each feed/ medications. The complications associated with malposition may range from mild to severe, or even be life threatening. Capnography, colorimetric devices, pH testing of gastric aspirate using pH indicator strips are reliable, but the most accurate method to confirm correct positioning is radiography.

REFERENCES

1) Nasogastric Tube Complications Www.sharinginhealth.ca/procedures/ nasogastric_tube.html December 2009.
2) Reducing the harm caused by misplaced Nasogastric Tubes. National patient safety agency, www.npsa.uk/advice nasogastrictube February 2005.
3) Detection of inadvertent airway placement of Gastric tube : Capnography versus colorimetric Carbon dioxide detector. American Journal of Critical Care.2007;16:19

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[11] *Lenox RH, Hahn CG.* Overview of the mechanism of action of lithium in the brain: A fifty year update. J Clin Psychiatry. 2000; *61 (Suppl):* 5-15.

[12] *Jefferson JW, Greist JH, Ackerman DL et al.* Red blood cell/plasma lithium ratio. In: Lithium encyclopedia for clinical practice, second edition. Washington, DC: American Psychiatric Press; 1987. p. 552-557.

[13] *Talati SN, Aslam AF, Vasavada B.* Sinus Node Dysfunction in Association with Chronic Lithium Therapy: A Case Report and Review of Literature. Am J Ther. 2009; *16:* 274-278.

[14] *Waring WS, Laing WJ, Good AM, Bateman DN.* Pattern of lithium exposure predicts poisoning severity: evaluation of referrals to a regional poisons unit. Q J Med. 2007; *100:* 271-276.