



Research Article

NG Tube Confirmation by Using the Chest X-ray

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Abstract

We should confirm the placement of the nasogastric tube before using it. One of the way of confirming the placement is by the chest X-ray toll that should be done within the golden hours period (4 hours within its insertion) to use the tube safely as soon as possible.

Keywords: Nasogastric tube; Chest X-rays; Confirmation of the placement of the nasogastric tube; Audit; Two cycles of audit

Introduction

Nasogastric tube is a medical process involving the insertion of a plastic tube through the nose, past the throat and down into the stomach. It is one of the common medical procedures that we perform in the medical or surgical wards. It has many rules and benefits, among them,

- 1- Decompression of the stomach in the case of intestinal obstruction.
- 2- Difficulty swallowing (for feeding).
- 3- 3-Giving medications.
- 4- Protection of the lungs from the gastric acid reflex.

Before we use the nasogastric tube, we should make sure that we are in the correct placement because if we use it and it is in the lung instead the stomach (where it should be), it will cause fatal complications.

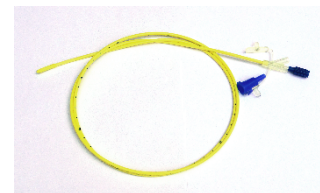


Figure 1: Nasogastric tube [1].

Nasogastric Tube Insertion

Before inserting the nasogastric tube, we should inform the patient about the procedure and the risk and benefit of it. If he cannot decide on behalf of himself (he does not have mental capacity), we should check if he an advance directive or he has appointed a person that has a power of attorney that we should discuss with him the procedure and its benefit and risks. We should take consent from the patient himself or any person has the authority to give consent otherwise we should act upon the patient best interest (all benefit). If we took the consent from the patient, we should prepare our self for the procedure. We should keep in our mind the following:

- 1- Patient dignity and keep his privacy and protect his confidentiality
- 2- We should illustrate the procedure to the patient before performing in
- 3- Tell the patient about the indication of the nasogastric tube
- 4- The risks and benefit of the procedure
- 5- How we will performing the procedure
- 6- If he needs any support or a chaperone
- 7- Taking consent for the procedure

This type of the procedure should be performed by a doctor that has experience of doing it (senior nurse, specialist nurse, junior doctor, senior doctor, and consultant).

We should prepare the following:

- 1- Nasogastric tube
- 2- Lubricant Gel
- 3- Nasal plaster
- 4- Acidity indicator
- 5- Bowel
- 6- Syringe

Performing the Procedure

- 1- We should put the bed of the patient in 45 degree and encourage the patient to relax
- 2- Asking the patient about any history of nasal fracture, surgery of nasal blockage or nasal deviation
- 3- We measure the length from the ear to the nasal tip then from the nasal tip to the stomach area (directly under the xiphoid process of the sternum)
- 4- We put a lubricated gel on the tip of the tube to facilitate its insertion
- 5- Inserting the tube into the nasal orifice down to the stomach till the length that we measured before
- 6- Put the syringe in the tube orifice and we try to aspirate a gastric fluid

If we managed to aspirate a fluid then we put the fluid on the acid paper in the bowel to see the acidity of the fluid, if it is acidic (PH 1.5-3.5), then this is gastric fluid and we are in the correct placement see Figure 2.

If we cannot aspirate a fluid, we should send a chest x-ray to confirm the placement of the nasogastric tube.

Note: There is a test called (Whoosh test) that include inserting an air through a syringe to the tube then we should hear a bubbling sound in the stomach by the stethoscope, this test nowadays is not confirmatory test and we cannot depend on it to conform the nasogastric tube placement anymore.

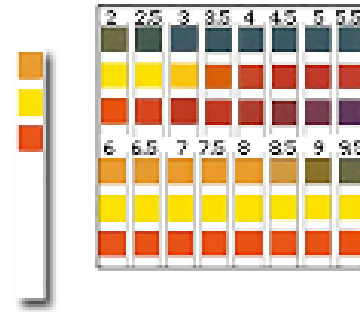


Figure 2: Graphic representation of a generic pH strips and colour scale for NG-tube placement [2].

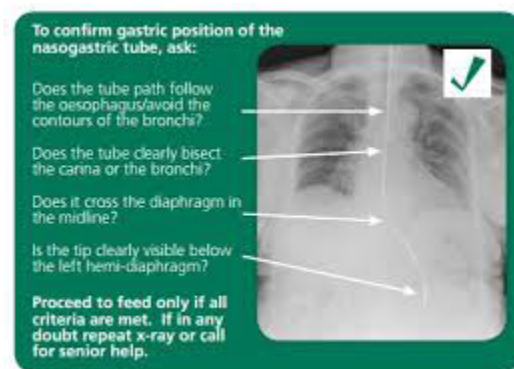


Figure 3: The chest x-ray is the best toll modality to confirm the nasogastric tube [3].

The Risks of the Nasogastric Tube are:

- 1- Trauma to the nasal bone or nasal mucosa
- 2- Dryness of the nasal and oral cavities
- 3- Damage to the teeth and dentures
- 4- Damage to the oesophageal mucosa
- 5- If incorrect placement, it will cause aspiration to the lung
- 6- Discomfort to the patient

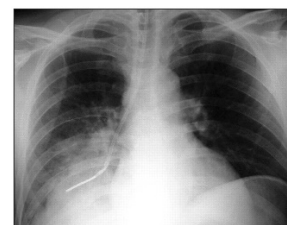


Figure 4: Incorrect placement of the nasogastric tube [4].

Methodology

I have done an Audit of 2 cycles with doing a local presentation in the monthly meeting of the elderly medicine department.

Nottingham University Hospital (NUH) Guideline:

According to the NUH guidelines, the CXR should be performed as a high priority (within 4 hours of inserting the tube) to conform the placement of nasogastric tube. Part for the clinical governance is to do AUDIT to compare our performance with the local guideline.

What has been done?

I have collected a random data of 100 patients in the August/2022 in the Stroke and Gastroenterology and HCOP wards that had a chest x ray to confirm the placement of the NG tube. I collected the data within 6 weeks' time and it includes male and female patients with different ages, different reason of admission and different indication of a nasogastric tube. Some patients in stroke they needed the nasogastric tube because they have difficulty swallowing and to give them medications such as (aspirin, direct oral anticoagulants, Parkinson medications.....). In the gastroenterology ward, most of the patients needed the nasogastric tube because they had small intestinal obstruction, to decompress the gastric system and to give medications to patients having difficulty swallowing.

It revealed that only 70% of the allocated patients had the CXR within 4 hours of the insertion to confirm the nasogastric tube location. But the entire patient had the chest X-ray within 24 hours.

The Reasons of the Delayed Chest X-ray Performance:

I spoked with the radiology doctors and the radiographers and they said the reasons are:

- 1- The request is out of hour and in very late time when the staffs are few in number so it is hard to get the patient to the x-ray department within 4 hours
- 2- Most of the time, the X-ray department is busy with the patients that hardly to secure an X-ray to all patients within 4 hours

- 3- The doctor sometime forget to request a chest x-ray so this will cause a delay of the process
- 4- There are no enough porters to send the patient to the x-ray department.
- 5- The patient sometime needs portable X-ray so it is hard to secure one especially in the late time or out of normal day hours' time

What should we do?

- 1- If we order a chest x-ray to confirm the NG tube placement, we should call the radiology department if it has not been done with 2-3 hours, so we can make sure it will be within 4 hours. We should report any phone consultation with the radiology team regarding the placement of the nasogastric tube
- 2- Always document the consultation with the senior doctors (Medical or radiology) before using the nasogastric tube
- 3- Book for early porters to send the patients to the radiology department as early as possible
- 4- If possible, the medical or nursing staff could send the patient to the radiography department to have the chest x-ray

I have done an oral presentation in the monthly meeting of the elderly medicine department in the Queens Medical Centre, Nottingham University Hospital NHS Trust to share the data collection result with my colleague and to highlight the importance of following the local guideline of the hospital to help us to use the nasogastric tube as soon as possible safely.

Another Cycle of the Audit

I have done another cycle of the AUDIT and I collected data of another one hundred patients 6 weeks after doing a presentation in the monthly meeting of the elderly medicine in the hospital, it showed that there is improvement in our performance and around 75% of the patients having their X-ray to confirm the nasogastric tube placement within the 4 hours.

Below is part of my data collection in the re audit cycle:

K number	Date of the admission	Date of collecting date	Working diagnosis	Date and time of the CXR request	Date and time of the CXR
K0297733	05/09/2022	26/09/2022	Stroke	05/09/2022 7:06	05/09/2022 9:12
K0314526	18/09/2022	26/09/2022	Stroke	19/09/2022 1:47	19/09/2022 8:35
K1535063	24/09/2022	26/09/2022	Stroke	26/09/2022 13:49	26/09/2022 18:14
K1002512	19/08/2022	26/09/2022	Stroke	02/09/2022 19:49	03/09/2022 1:21
K1168516	02/09/2022	26/09/2022	Stroke	16/09/2022 20:19	16/09/2022 21:43
K0866818	01/09/2022	26/09/2022	Stroke	24/09/2022 8:03	24/09/2022 09:12
K0174602	10/09/2022	26/09/2022	decompression	15/09/2022 15:17	15/09/2022 21:12
K0168702	22/09/2022	28/09/2022	Stroke	26/09/2022 19:00	27/09/2022 00:12
K3560685	23/09/2022	10/05/2022	Abdominal fistula	28/09/2022 22:16	28/09/2022 22:37
K3020251	28/09/2022	10/05/2022	Poor feeding	28/09/2022 18:00	28/09/2022 18:30
K2055126	27/09/2022	10/05/2022	ETOH excess	28/09/2022 12:51	28/09/2022 17:47
K3488002	26/09/2022	10/05/2022	GB syndrome	28/09/2022 16:00	28/09/2022 16:24
K3570951	26/09/2022	10/05/2022	Brain Injury	28/09/2022 7:35	28/09/2022 15:40
K0174602	10/09/2022	10/05/2022	Hepatic encephalopathy	15/09/2022 21:00	15/09/2022 22:42
K0670882	14/09/2022	10/05/2022	feeding	15/09/2022 17:30	15/09/2022 20:20
K3570918	29/09/2022	10/05/2022	stroke	29/09/2022 00:27	29/09/2022 00:55
K3566800	22/09/2022	10/05/2022	cancer	29/09/2022 00:00	29/09/2022 00:46
K3571473	27/09/2022	10/05/2022	trauma	28/09/2022 22:30	28/09/2022 23:02

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