An overview of opinions on nasogastric tubes as aerosol generating procedures during the Covid-19 crisis.

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The President of BAPEN, Dr Trevor Smith has asked me to look into the debate around nasogastric tube placement as a potential aerosol generating procedure on behalf of BAPEN.

There is clearly some difference of opinion over the relationship between nasogastric tube (NGT) or nasojejunal tubes (NJT) insertion and generation of aerosols with important relevance to the use of personal protective equipment (PPE). The varying views and evidence can be reconciled quite simply in a pragmatic manner by looking at the circumstances under which NGT placement is occurring during the Covid-19 epidemic.

We have been told that to protect ourselves and others, we must practice physical distancing of 2 metres to avoid being caught by droplets from coughing. Droplets containing Covid-19 virus are sized at around 10 microns and do not penetrate the lungs to the same depths as an aerosol of 5 microns or less. However, it seems that even coughing can produce an aerosol as defined in the latest **PHE guidance** (https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/covid-19-personal-protective-equipment-ppe). This states that one of the procedures which creates an aerosol is "Induction of Sputum (coughing)". It is clear from our expert nutrition nurse specialists that NGT placement induces coughing often enough for NGT placement to be regarded as an AGP. Since all patients with Covid-19 undergoing insertion of NGT have a cough unless heavily sedated on a ventilator, insertion of an NGT is most likely to induce further coughing and aerosol production.

Furthermore, Covid-19 patients in hospital are in an environment in which aerosols are being produced as a result of suction, CPAP, ventilation or chest physiotherapy. The spread of aerosols in an enclosed space is much greater than 2 metres and for longer (BSG Endoscopy guidance in Covid-19 crisis).

NGT placement has been regarded as a NON-AGP under ideal conditions with no coughing or sneezing induced by the procedure and until recently that was the view driving advice on PPE requirements during NGT placement. A Canadian systematic review in 2012 found little evidence in favour of NGT generating aerosol and increased risk of transmission to healthcare workers (Tran et al, 2012). I have available to me an opinion from a very experienced Infectious Diseases specialist physician who represents the Royal Medical Colleges on the Academy of Royal Medical Colleges in discussions with the CMO. He regards NGT placement as NON-AGP but he agrees that this is somewhat semantic when the hospital environment in which the procedure takes place during the Covid-19 crisis is taken into consideration.

However, not all authorities regard NGT placement as a non-AGP. **ASPEN** specifically states it is an AGP – "Placement of any enteral access device may provoke coughing and should be considered an aerosol generating procedure". If NNNG guidance (2016) on NGT placement is followed, patients are advised to clear their nose, if necessary, by blowing or sniffing to identify which nostril is preferable. This might create an aerosol.

Opinion from many nutrition nurse specialists and members of BAPEN is that NGT is an AGP and that full PPE must be used during NGT placement for the protection of the nurse. Their views are based

on their clinical experience of placing such tubes and the prevailing environment within hospitals. In addition, the published **NNNG** guidance on NGT during this crisis initially stated NGT/NJT to be non-AGP but this view has now been changed as follows:

"The use of PPE for insertion of nasogastric (NG) and nasojejunal (NJ) feeding tubes

There have been many conflicting opinions regarding the use of PPE and the insertion of enteral feeding tubes in relation to COVID-19. The PHE advice to healthcare professionals should be followed.

You should ensure you keep up to date with regards to any changes to this advice.

https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-contr

The insertion of NG and NJ tubes is considered to be a non-aerosol generating procedure (AGP) by Public Health England (PHE). However, amongst nursing and other HCPs, it is widely acknowledged that there is significant potential for the patient to initiate a cough or may require suction to the oral cavity or upper airway, which is considered an AGP. In view of this, we would deem NG and NJ tube insertion to be an aerosol generating procedure and recommend that the PHE guidelines for AGP are followed.

In addition, as per RCN recommendations, those patients who are non-COVID a risk assessment should take place and any PPE deemed necessary should be worn.

All patients requiring care or interaction within 2 meters undertaking a non AGP:

- *Fluid resistant surgical facemask*
- *Apron*
- *Gloves*
- *Eye protection*

Fluid resistant surgical mask can be worn for a maximum of 4 hours but should be changed sooner if becomes damp or damaged. The mask should not be touched while being worn.

All AGPs or those in high risk areas:

- *Long sleeved gown*
- *FFP3 mask*
- *Eye protection*
- *Gloves"*

The Updated Intercollegiate General Surgery Guidance on COVID-19, 27th March 2020, states "Naso-gastric tube placement may be an aerosol generating procedure (AGP). AGPs are high risk and full PPE is needed. Consider carrying out in a specified location".

The BDA have an unequivocal statement that NGT placement is an AGP:

“The insertion of Nasogastric Tubes (NGT) and Nasojejunal Tubes (NJT) should be categorised as Aerosol Generating Procedures (AGP). As a result, any dietitian (or other healthcare professional) asked or required to undertake this role (in any setting), should be provided with appropriate PPE. If you are asked to undertake duties without sufficient PPE, you should refuse to do so and notify your Union Rep or our TU team. You may try to find an alternative healthcare professional with appropriate PPE to complete duties on your behalf. See the FAQ under Employment Rights below for more information".
From: https://www.bda.uk.com/resource/covid-19-coronavirus.html

It is reported from one nursing member of the BAPEN NGT-SIG that the **RCN Critical Care Forum** is also supportive of NGT as an AGP.

NGT placement in the Community

The same considerations applying to hospital NGT placement are applicable to community NGT placement in patients’ homes or care homes. However, the implications for PPE are less clear due to the lack of available guidelines on use of PPE in the community. The practical constraints on use of PPE in the community are considerable including the non-availability of adequate hand washing facilities (lever arm taps) and suitable places for PPE to be donned, removed and disposed of. The risk of passing on the virus from one patient to another, or to colleagues or family members of the nurses becomes more likely with inadequate facilities for PPE, or inadequate PPE provision which is an ongoing problem at the time of writing. Even if a nurse has recovered from Covid-19, there is still a risk of transmitting the virus via fomites if PPE is inadequate or cannot be used correctly.

NGT (re)placement in the community may be non-AGP if all goes well as most patients will not have active CV-19 induced coughing but the risk of two-way transmission is considerable since all must be considered potentially infected at the present time. The proximity of the nurse replacing a community NGT is also much closer than 2 metres.

Conclusions

The theoretical view that NGT/NJT placement might be non-AGP is outweighed by the more significant risks associated with the type of patient involved, the hospital environment in which the procedure takes place and the importance of protecting the nurses from CV-19. An infected nurse out of action in quarantine or worse will detract from the ability of the NHS to respond to this crisis.

Full PPE must be used in hospital NGT placements in all settings unless there is certainty that the patient does not have Covid-19. NGT must be regarded for all practical purposes as an AGP.

In the community, the risks may not be as great but a fail-safe approach to protect nurses and others from onward transmission is necessary. In the absence of central guidance on the practical aspects of PPE in the community (e.g. in a tower block corridor outside a flat, or front garden), patients may have to be transferred to hospital for NGT replacement although we have major misgivings that appropriate personnel will be available to provide such a service. We also recognise that such a policy would place a greater burden on hospital services so over stretched at this time. There is thus an urgent need for guidance on how to conduct potentially aerosol generating procedures in the community.

Prepared by Dr Barry Jones BSC, MBBS, MD, FRCP on behalf of BAPEN and its Nasogastric tube Special Interest Group, 11/04/2020

References

Practical Advice and Guidance for management of nutritional support during Covid-19. NNNG. Version 1.0, April, 2020 https://www.nnng.org.uk/covid-nnng-document-v1-final/

Good Practice Guideline: Safe insertion and ongoing care of nasogastric (NGT) feeding tubes in Adults. NNNG, April, 2016, Point 10. www.nnng.org.uk

PPE in AGP: https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/covid-19-personal-protective-equipment-ppe

ASPEN, April 1st, 2020: Nutrition Therapy in the Patient with COVID-19 Disease Requiring ICU Care . Martindale et al.
https://www.nutritioncare.org/uploadedFiles/Documents/Guidelines_and_Clinical_Resources/Nutrition%20Therapy%20COVID-19_SCCM-ASPEN.pdf

Updated Intercollegiate General Surgery Guidance on COVID-19 27th March 2020
https://news.rcpsg.ac.uk/wp-content/uploads/2020/03/Updated-Intercollegiate-General-Surgery-Guidance-on-COVID-19-Amended-27-March-2020.pdf

Aerosol Generating Procedures and Risk of Transmission of Acute Respiratory Infections to Healthcare Workers: A Systematic Review.
Khai Tran, Karen Cimon, Melissa Severn, Carmem L. Pessoa-Silva, John Conly. PLoSOne. www.plosone.org. April, 2012;7, Issue 4 e35797. doi:10.1371/journal.pone.0035797

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