

Management of the inner cannulae

Most tubes are available with removable and therefore cleanable inner cannulae. Designs and materials are improving all of the time and a tube with an inner cannula does not necessarily mean that the internal diameter (and subsequent resistance to air flow) is as compromised as it perhaps used to be with previous designs. Cleaning aims to remove secretions from the inner cannula to reduce the risk of potential obstruction with sputum and reduce the risk of infection. Secretions can adhere to the internal lumen of a tracheostomy tube and severely reduce the inner lumen diameter over time. This potentially can increase the work of breathing and/or obstruct the patient's airway.

The inner cannula should be removed and inspected at least once per 8 hour shift or if the patient shows any signs of respiratory distress. For a patient undergoing mechanical ventilation, it may not be safe to repeatedly disconnect the ventilator circuit and change the inner tube routinely. Cleaning or changing an inner tube should always represent the best balance of risks to the patient. If an inner tube is not changed, then it should be clearly documented and communicated, along with the rationale.



There is debate within the literature on the most appropriate cleaning solution to be used in the context of inner cannula care. A wide variety of solutions are used across health care including tap water, sterile water, sterile saline and hydrogen peroxide 10w/v (3%). Evidence to support the use of tap, sterile water or other solutions is equivocal and therefore local policies are highly likely to vary in their recommendations. This is acceptable from a patient safety perspective but local practice should be influenced by the available water supply and quality, types of tubes used and patient condition. For most obtunded or acutely unwell hospital inpatients, sterile water would seem more appropriate.



It is important to note that the central rationale for cleaning of inner cannula is to mechanically remove debris which may physically obstruct a patient's airway. A secondary outcome of mechanical cleaning is a reduction in the numbers of microbes present.

Inner cannulae can be cleaned at the patient's bedside.

It should be noted that there can be significant differences between the different manufacturer's tubes. Kapitex and Shiley tubes commonly require an inner cannula to be in place so that the tubes can be connected to a 15mm standard anaesthetic breathing circuit. It is therefore essential that patients with these types of tubes in situ have a spare inner tube with them at all times. Videos demonstrating these differences can be accessed by [clicking here](#).

Disposable inner cannulae are also available from some manufacturers and can improve the ease and subsequent compliance with inner tube care. There is an associated cost and environmental consideration but this may be expected to improve with newer material technologies.

Equipment in addition to standard bedside equipment includes:

- Clean, disposable gloves
- Clean and dry replacement inner cannula
- Tracheostomy cleaning devices (sponges or brushes)
- Fragrance free detergent
- Cleaning solution: tap water, sterile water or sterile saline (refer to local guidelines from infection control department)
- Clean and dry covered container for spare inner cannula

Procedure

Cleaning an inner tube is a relatively straightforward procedure. The inner cannula is removed and inspected. If clean, it can simply be replaced. If it needs to be cleaned then a spare tube should be inserted at this point. Patients will therefore have one inner tube in situ and one at the bedside being cleaned or drying. Dedicated cleaning packs are commercially available which makes cleaning quicker and easier (and often more likely to occur).

The tubes should be visibly clean and this can usually be achieved with saline and a foam brush or gauze. Abrasive wire brushes may cause scratch marks on the inside of the tubes and risk colonisation. The tubes are then left to dry in a suitable container. It is essential that the tubes do not sit in water as this may lead to bacterial growth.

Disposable inner tubes are increasingly available and affordable.

Videos demonstrating changing an inner cannula can be accessed by clicking the links below, or by visiting the e-learning section of the website www.tracheostomy.org.uk.

- [YouTube video of inner tube changes](#)
- [Narrated e-learning link](#) (requires flash player)

Documentation

Documentation should include accurate records of inner cannula care in the required format within the patient's record as per local guidance. Ensure handover of all information, reporting any problems in changing the inner cannula or missing inner cannulas.

Summary

The table below summarises key actions related to stoma care and their rationales (adapted from NPSA expert working group)

Action	Rationale
Explain and discuss procedure with the patient as appropriate	To relieve patient anxieties and gain patient consent and co-operation.
Clean hands and apply appropriate PPE	To reduce the risk of cross infection
Perform tracheal suction if necessary	To ensure airway is clear prior to procedure commencing
With one hand stabilise the outside of the tracheostomy tube. Remove inner tube with the other hand	Removal of the inner tube with minimal movement of the tube on inner cannula removal
If the inner tube is clean and clear of secretions, simply reinsert	No further cleaning required
If there is difficulty in removing the inner tube call for help from an appropriately trained healthcare professional.	Dry tenacious secretions or granulation may prevent the inner tube from being removed which requires prompt attention
If inner tube requires cleaning, replace with clean/spare inner cannula whilst cleaning is taking place	The tracheostomy tube should always have an inner cannula in place to prevent tube blockage.
If the inner tube is fully or partially blocked with secretions, flush with locally agreed cleaning solutions and if necessary use a tracheostomy cleaning sponge or brush	To remove debris that may block the tube this may become a source of infection. Cleaning devices should be used with caution and care not to cause abrasion to inner surface of inner cannula.
If tube is coated with dried- on secretions, it may need to be disposed of and a	Excessive cleaning can damage the cannula and they

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replacement cannula placed at bedside	should not be left to soak as it is an infection risk.
Rinse the inner cannula through with sterile water	To remove secretions and reduce infection risk
Shake excess water off inner cannula and place in covered clean container to dry prior to re-use	To ensure a clean and dry inner cannula is available for use.
Ensuring the cannula is locked into place as per the manufacturer's instructions	To prevent the cannula dislodging
Observe secretions amount and consistency	To observe for signs of infection or inadequate humidity