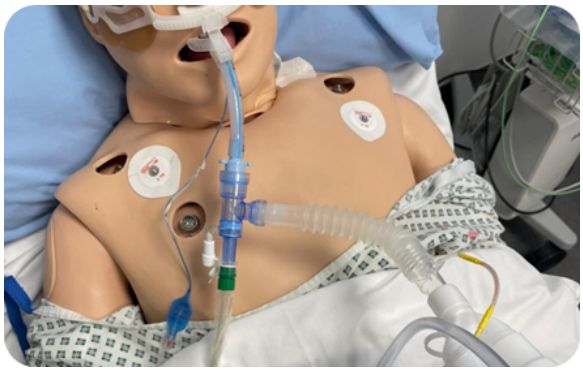
In-line suction



AKA - “closed suction”

What is it?

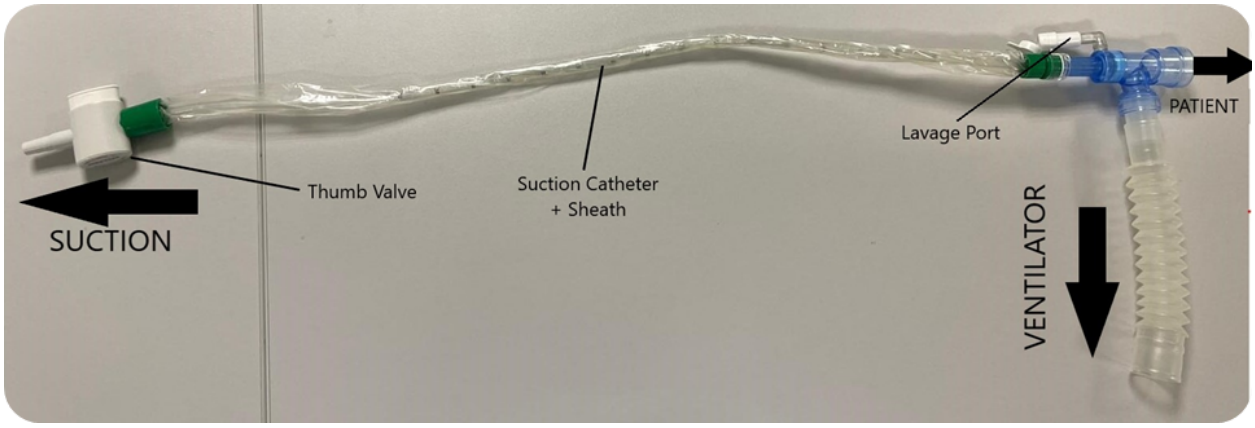
A catheter mount that turns at a right angle and allows for constant connection to ventilator and a suction catheter with wall suction, within a closed system.

How does it work?

It is a completely airtight, T-shaped device that connects directly to an ETT or tracheostomy. The tubing that attaches to the ventilator comes off at a right angle from the airway. In the same direction as the airway, is a suction catheter covered by a clear plastic sheath. This suction catheter is constantly attached to wall suction which is turned on, but a valve at the bottom of the suction catheter (thumb valve) allows the system to be airtight until the valve is opened. The suction catheter is ‘hung’ outside the airway from the junction piece, and is able to be pushed into the airway by hand.

There is also a lavage port that can be used to inject saline down the tube, or to clean the suction catheter.

What does it look like?



What does it do?

Allows for easy access down the ETT/tracheostomy predominantly for secretion clearance, but also for lavage, without disconnecting from the patient from mechanical ventilation. To perform suction, the catheter is passed down the airway up to the hilt, or until it meets resistance, and then the suction valve is opened and the catheter is simultaneously pulled out. The withdrawal

should be slow and at a gradual pace, normally between 3-5seconds. This can be combined with physio techniques like shakes and percussions to allow for greater secretion clearance.

What can go wrong?

The most **common** complications and how to deal with them:

- Disconnection
    - Usually occurs when rolling/moving
    - → Both ends of the device simply push together either to the ETT or to the ventilator.
- Unable to pass catheter
    - Occasionally due the positioning and angle of the airway in the patient, the catheter can get stuck when going down the airway
    - → This can normally be solved by carefully repositioning the airway or changing the direction of the catheter into the airway (often, pushing the suction more superiorly can help it go round the corner at the back of the airway)

The most **serious** complication:

- Suction can cause an increase in vagal tone, particularly in patients with high spinal cord injury. This can induce severe bradycardia and hypotension, and in rare occasions cardiac arrest. This can be treated with anticholinergic agents like atropine or glycopyrrolate.

Key safety point

Whilst the suction is ‘engaged’, the patient is not being ventilated and the pressure inside the airways will fall significantly as the gas inside the airways is drawn through the suction. This means that patients who have severe respiratory failure can deteriorate due to suctioning.

Other notes

Suctioning is a technique that is more commonly performed by the nursing staff and physios. They will be more than happy to help advise on how to perform it.

Further reading

- How to perform inline suction - Closed Suction for tracheostomy patients with CoVID -19 - YouTube
- Mathias, C.J. Bradycardia and cardiac arrest during tracheal suction —Mechanisms in tetraplegic patients. *Europ. J. Intensive Care Med* **2,** 147–156 (1976). https://doi.org/10.1007/BF00624607