Suggestions for use of the C-MAC D blade

Tim Cook

1 When to use?

I would encourage folk to get used to using the D-blade. It requires a completely different technique to the Macintosh blades. It needs practice.

I now use it

- If I have a grade 3 view
- If I have to use anything above normal force
- If I think intubation may be difficult or safe apnoea time will be short and I wish to succeed first time (eg obesity)
- I consider it first up if patient has crowns at the front

2 Preparation

Choice of tube

Consider a smaller tube

Using a smaller tube is generally beneficial. Size 6.0, 6.5 and 7.0 mm ID are suitable for small, medium and large adults respectively. A medium stylet is needed.

If intubation may be difficult consider a tube with a bevelled end – eg Parker tipped or ILMA TT

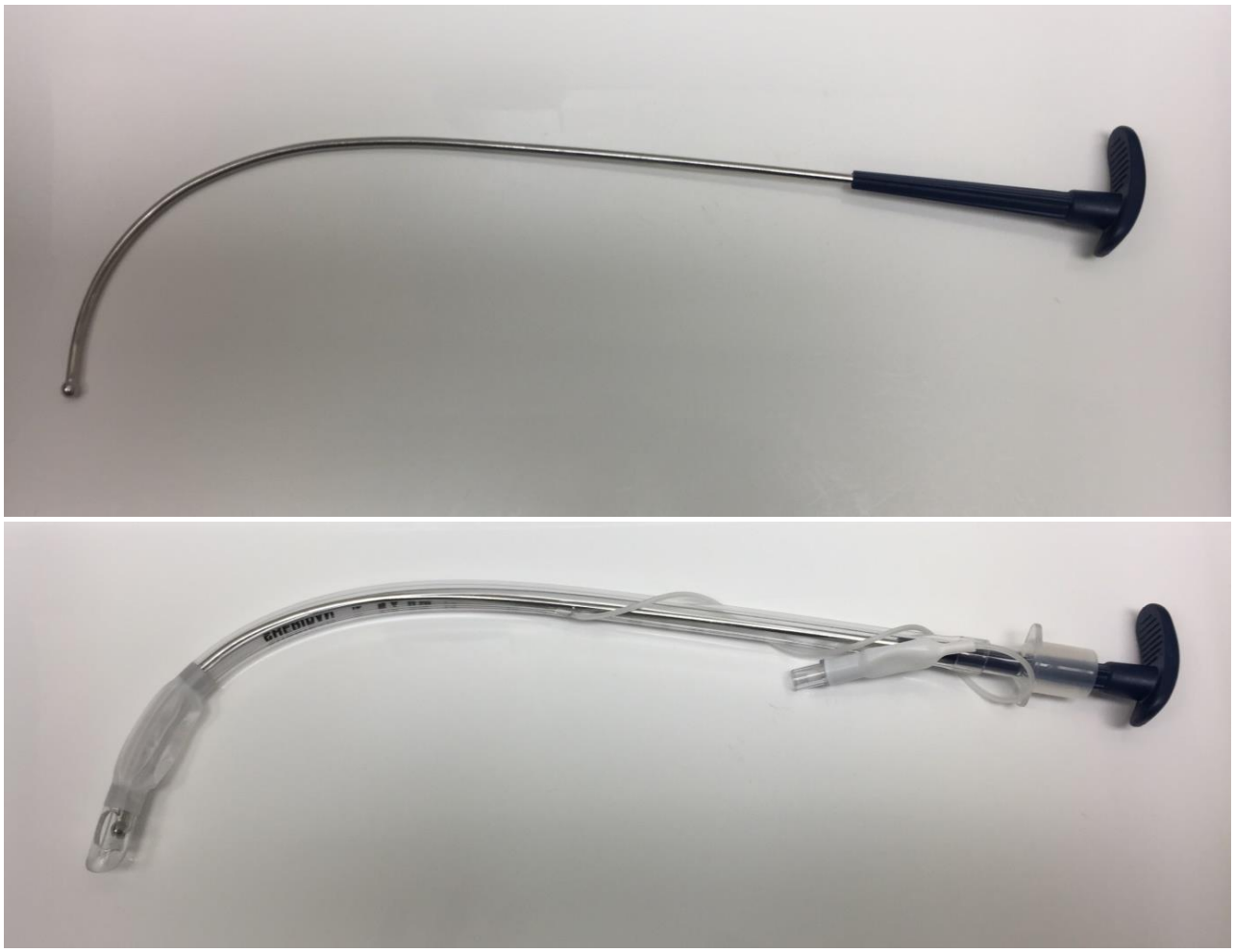
Choice of curving device

For all stylets, Put stylet in TT – advance only as far as the last 2cm of TT.

Generally I use a C-Mac stylet but can use others

1 C-MAC stylet

These are pre-formed.
Lubricate before inserting inside tracheal tube.



Do note these are REUSABLE.
Please do not dispose of but send for sterilisation.

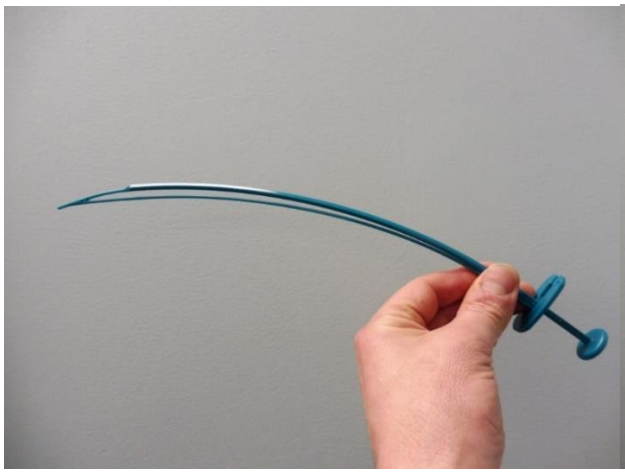
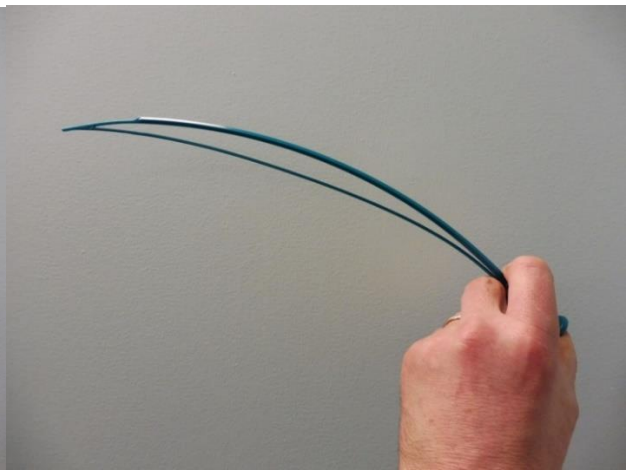
2 Malleable STYLET

Generously lubricate the stylet. This is essential as it must slip in and out of the TT – including when the tube is curved – it slips far less well when tube is curved. If you don't lubricate the technique fails.

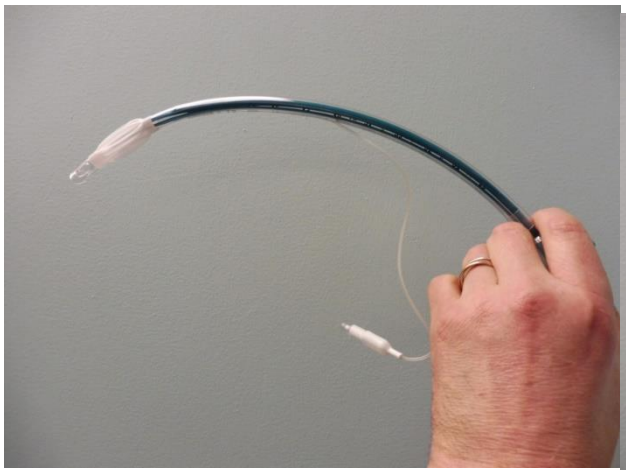
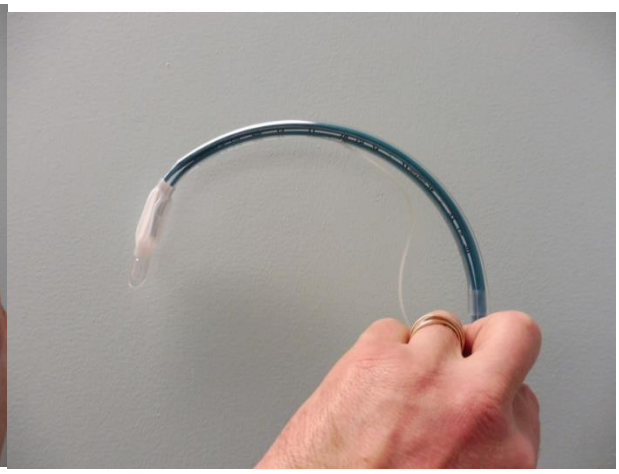
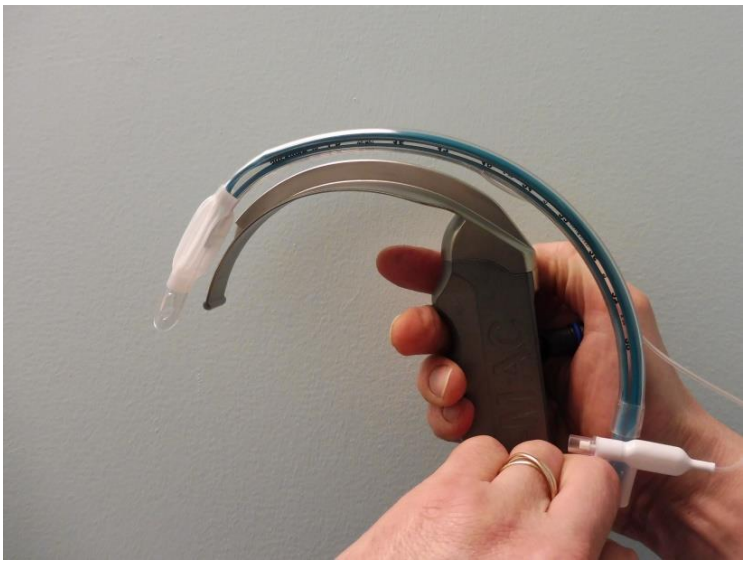
Curve the tube and stylet to the exact shape of the D-blade. I put a slight extra anterior curve at the distal end.

3 PARKER FLEX-IT

This is basically a plastic bow. When the tip is squeezed the bow is bowed.

If this is done inside a tube it curves the tube.

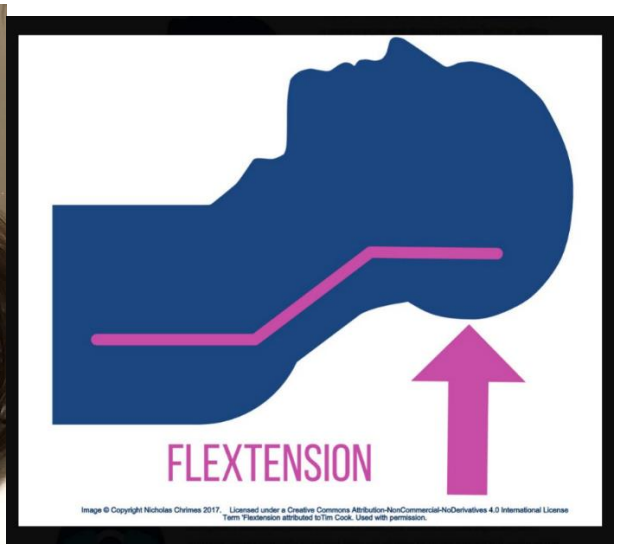
BUT – will not work for a rigid cold tube. AND the devices are one use only and very fragile. They break once used!
They cost £2 (compared to £5 for stylet and £5-7 for bougie so may be the cheapest option)

3 Technique

The key difference with a D-blade is that you cannot use direct laryngoscopy. The curve is such that it is not possible for the operator to see where the tip is. Therefore the operator must use it as a VL – i.e. use the screen.

- Step 1

Get the patient in the right position.
This is ‘sniffing the morning air’ or as I prefer, ‘flextension’ with flexion of the lower cervical spine and extension of the upper cervical spine. Most intubators forget the flexion!”



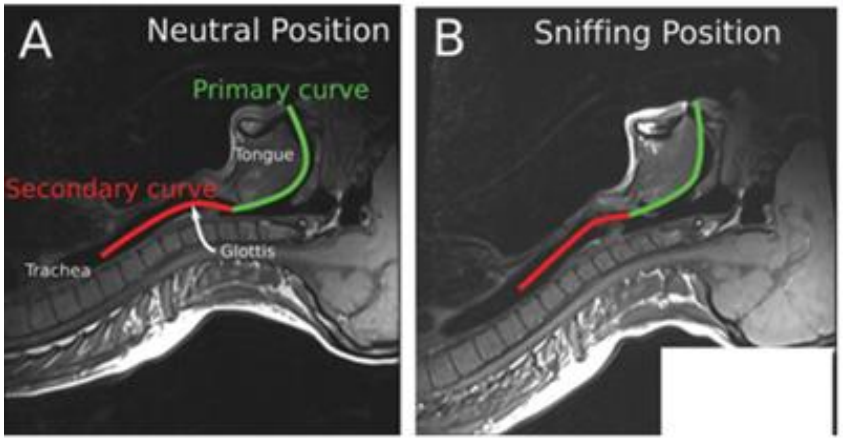


Figure 14.1 Airway passage (solid curved line) superimposed over MRI scan showing primary (solid green line) and secondary (solid red line) curves. (A) ‘Neutral position’ (no pillow): small radii of curvature of both curves. (B) ‘Sniffing position’: head lift (flexion of lower cervical spine) and head extension (extension of upper cervical spine) causes flattening of both curves.

Flextension flattens the airway curves and makes both access to the airway AND tube delivery easier

- Step 2 Insertion of the blade

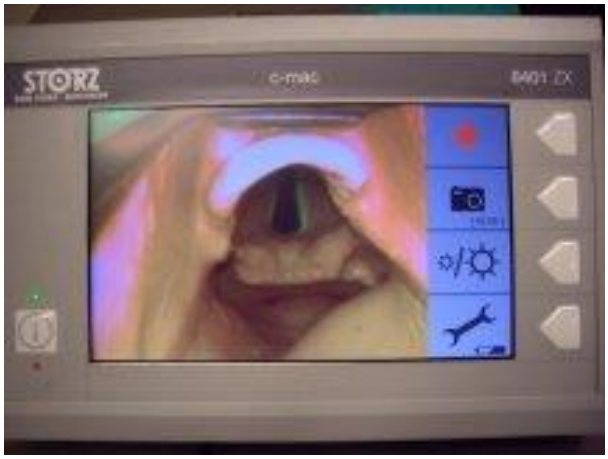
Slightly more awkward to get the blade into the mouth. It may be useful to insert it sideways and then move into position.

- Step 3 Advancing the blade.

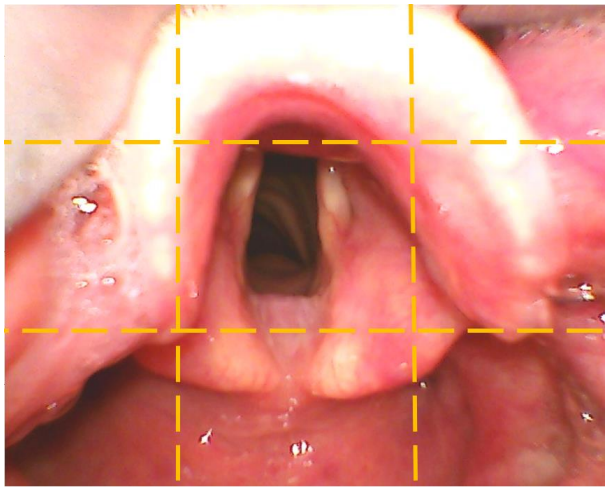
Storz recommend inserting as a normal laryngoscope down right side of tongue.

In contrast the Glidescope folk tell users to insert over middle of tongue – as both are angulated blades both are ok.
I insert it over middle of tongue.

- Watch the blade as it enters the mouth.
- Once the tip starts to go around the ‘corner’ switch to observing on the screen.
- As you advance use the curve of the blade to rotate along the tongue.
- You generally need almost no force. Watch the screen.
- Place the tip into vallecula (do not go beyond epiglottis as this makes tube insertion more difficult).
- Try to get the tip right into the middle of the vallecula and engage the hyo-epiglottic ligament to elevate the epiglottis and improve the iew.
- You should almost always get a grade 1 view. If you need to improve view pull directly upwards – i.e. vertically. Use BURP and OELM as necessary.
- Get the best view. Aim to have the glottis in the MIDDLE of screen.



Think of the screen as a 3 x 3 grid and get your target in the middle of the grid



It is a common complaint that with VL ‘you get a better view but struggle to intubate’. In my opinion this is due to *poor technique*. Certainly, good technique will make this a rarity.
The key is that you need to place the tube where the camera is pointing.

When inserting the TT please watch it into the mouth until it disappears then watch it appear on the screen. There is a brief ‘blind spot’ but doing this will reduce the risk of pharyngeal trauma.

- STEP 4 Advancing the tube

Bath technique:

- Insert TT/stylet into mouth from right and as it reaches the posterior oropharynx bring it to lie on the laryngoscope blade.
- Slide it along the curve of the blade, keeping the tube tip in contact with the blade. This will ensure the tip of the TT goes exactly where the camera is looking and also avoids the TT hitting or traumatising the posterior pharyngeal wall.
- If you have the larynx in the middle of the screen *physics dictates that the TT should go straight into the laryngeal inlet*.
- As the TT reaches the larynx you may lose the view a little, but provided blade and tube remain in place the intubation should be easy. Withdraw the stylet as you advance the TT. If you don’t do this a) you may struggle to advance the TT as the anterior curve prevents the TT advancing down the TT and pushes it against the anterior tracheal wall b) you may injure the anterior wall of the trachea.

Note:
If there is any impingement a 90 degree anticlockwise rotation may well help.
Use of a small tube and a bevelled tube make this an unlikely problem.
Use of the flextension position minimises the risk of difficulty with tube delivery.

Alternative techniques
North American technique ’Staying high and dry’
In this technique the blade is pulled back a bit until the epiglottis falls creating a 2b view. The proponents of this suggest this gives a wider view and that the tube can be brought in from the side and can be seen all the way into the glottis.
My problems with it are twofold

- It means you are intentionally making the view of the glottis less good than it could be
- It seems unnecessary as the Bath technique works very well and provides precision intubation
- A fair few people talk about ‘can see cannot intubate’ and they mostly seem to be using this technique!! I wonder if they are also not using the flextension position, which will optimise tube delivery below the glottis.

Bougies- A technique to avoid?
I would avoid a standard bougie completely.
The bougie CAN be hyper-curled and then used with the D-blade. However, the only bougie with any chance of retaining the shape (i.e. with memory) is the old fashioned GEB. The modern bougies (blue) have poor memory and uncurl rapidly.

This means the bougie is the same curve as the blade only for a fraction of a second. This promotes a rushed technique and a high likelihood of the bougie entering the oesophagus.
I would not do it.

Advanced bougies
Flex tip bougie and more semirigid introducers may have role but this has not yet been properly explored.

Good luck –but your luck will improve with good technique.
Of course, I suggest practice on a manikin to hone the technique before use on a patient.

Tim Cook Updated 18 Jan 2023