



National Tracheostomy Safety Project



The Faculty of Intensive Care Medicine



Paediatric Working Group

Paediatric Tracheostomy Emergency Algorithm

Outline

Tracheostomy in children

Tracheostomy Emergencies

National Tracheostomy Safety Project

Tracheostomy Package

Emergency Algorithms

Tracheostomy in Children

Increasing complexity of patients

Increase in length of hospital and PICU stay

Increasing numbers of Tracheostomy patients

National demand for LTV

Our mission to keep them safe

National Tracheostomy Safety Project

Dr McGrath (Manchester)

Identified tracheostomy and laryngectomy safety concerns

Early complications due to haemorrhage, blockage or displacement with a high likelihood of harm

NAP4 found that death occurred in up to 50% of patients in these areas when a tracheostomy became displaced

Developed with Resuscitation Council UK – training and guidance documentation


Tracheostomy Package

Tracheostomy website

TRACHE poster

BEDHEAD signs

RESUS algorithm

Patient ID Label Birmingham Children's Hospital  NHS Foundation Trust

Week Beginning: _____

'TRACHE' – ESSENTIAL CHECKS FOR TRACHEOSTOMY PATIENTS


Please tick when task complete and initial during each shift		MON	TUE	WED	THU	FRI	SAT	SUN											
	Date																		
T	Tape change (daily)																		
	Trache change (minimum weekly)																		
	Tube order tracking form (if reqd)																		
R	Resus plan present Bedhead sign complete & Resus algorithm in bedspace																		
	Airway suction present If inner tube - change 4-hourly If cuffed tube – cuff check each shift																		
C	Care of stoma & neck – check any tissue viability issues																		
	Care Plan Documentation																		
H	Humidity present – check should have HME or humidifier in use																		
E	Emergency box identified & content checked – TRACHE case Must ensure checklist completed*																		
	Nurse/Carer to initial each shift	E	L	N	E	L	N	E	L	N	E	L	N	E	L	N	E	L	N

v.1.0.1 26/08/14 SB, YH, RN PICU Safety Team/Tracheostomy Group

Tracheostomy Care


T

Tapes: Keep tube secure
Ensure the tension on the tapes is tight enough to support the tube. ONE finger should fit comfortably between the child's neck and tapes. Velcro tapes may be used (by exception only) but must be risk-assessed.




R

Resus – Know the resuscitation process
Safety. Stimulate. Shout for help. Provide oxygen to face and over tracheostomy. SUCTION airway – the tube may be blocked or displaced Follow the Tracheostomy resuscitation algorithm and give BLS




A

Airway clear – Use correct suction technique
Use correct catheter size and length of suction. Know the length of the child's tube and only suction to this length. Keep a pre-cut measure at the bedside. The catheter size should be 'double the size of the tube'; e.g. 8 FG catheter for a 4.0 ID tube.




C

Care of the site – Stoma and neck
Trache site should be cleaned at least daily and any breakdown noted and treated. Don't forget the back of the neck! Escalate concern if evidence of breakdown. Consider cushioned (Marpac) tapes after a risk assessment.




H

Humidity – Essential to keep the tube clear
Must use a wet circuit or a heat & moisture exchanger (HME). Use warmed humidity systems for small babies at risk of heat loss. Use the correct size HME.



E

Emergency Box – Have the box present and visible
Emergency box should only contain the correct equipment. Equipment list inside the lid of the box. No other items should be present. The box should NOT be individualised as this reduces the ease of recognition. Keep basic airway equipment ready at the bedside.





Tracheostomy box list

2 x spare tracheostomies same size in a sealed package/container

Trache name and size _____ Distal length _____ mm

1 x spare tracheostomy size smaller led package/container. Can be a Shiley.

Spare trache name and size _____ Distal length _____ mm

- Cotton Tape (Twill tape)
- Tube fixation holders tapes (if appropriate)
- Round ended scissors
- 2 ml syringes x 2

- Aquagel x 2

- Sleek tape x 1

- HME appropriate for patient

- 0.9 % sodium chloride vials x 2

If cuffed:

-1 x 5ml I syringe

-Water (if balloon inflated with water)

Store at head of bed:

PICU airway bag/Going out bag/community –use appropriate safety checklist list

Oxygen

Guerdel Airway

High Flow Oxygen delivery face mask with reservoir

Self -inflating bag valve mask with oxygen reservoir and tubing

Suction and suction catheters

Gloves Eye protection

Water for cleaning suction tubing

Emergency Paediatric Tracheostomy Management

SAFETY - STIMULATE - SHOUT FOR HELP - OXYGEN

SAFE: Check Safe area, Stimulate, and Shout for help, CALL 2222 (hospital) or 999 (home)
AIRWAY: Open child's airway: head tilt / chin lift / pillow or towel under shoulders may help
OXYGEN: Ensure high flow oxygen to the tracheostomy AND the face as soon as oxygen available
Capnograph: Exhaled carbon dioxide waveform may indicate a patent airway (secondary responders)

SUCTION TO ASSESS TRACHEOSTOMY PATENCY

Remove any attachments: humidifier (HME), speaking valve and change inner tube (if present)
 Inner tubes need re-inserting to connect to bagging circuits

The tracheostomy tube is patent
 Perform tracheal suction
 Consider partial obstruction
 Consider tracheostomy tube change

Can you pass a SUCTION catheter?

Yes

CONTINUE ASSESSMENT (ABCDE)

No

EMERGENCY TRACHEOSTOMY TUBE CHANGE

Deflate cuff (if present). Reassess patency after any tube change
 1st – same size tube, 2nd – smaller size tube
 * 3rd – smaller size tube sited over suction catheter to guide
IF UNSUCCESSFUL – REMOVE THE TUBE

IS THE PATIENT BREATHING? - Look, listen and feel at the mouth and tracheostomy/stoma

No

5 RESCUE BREATHS – USE TRACHEOSTOMY IF PATENT

Patent Upper Airway – deliver breath to the mouth
 Obstructed Upper Airway – deliver breath to tracheostomy/stoma

Yes

RESPONDS:
 continue oxygen, reassessment and stabilisation

CHECK FOR SIGNS OF LIFE ? – START CPR

15 compressions : 2 rescue breaths
 Ensure help or resuscitation team called

Plan for definitive airway if tube change failure

Basic Response

Advanced Response

Primary emergency oxygenation

Standard ORAL airway manoeuvres may be appropriate.
 If so cover the stoma (swabs / hand).
 Use:
 Bag-valve-face mask
 Oral or nasal airway adjuncts
 Supraglottic airway device e.g. Laryngeal Mask Airway (LMA)

Tracheostomy STOMA ventilation
 Paediatric face mask applied to stoma
 LMA applied to stoma

Secondary emergency oxygenation

ORAL intubation may be appropriate with a downsized ET tube
 Uncut tube, advanced beyond stoma
 Prepare for difficult intubation
 'Difficult Airway' Expert and Equipment**

Attempt intubation of STOMA
 3.0 ID tracheostomy tube / ETT
 'Difficult Airway' Expert and Equipment**

**EQUIPMENT: Fiberoptic scope, bougie, airway exchange catheter, Airway trolley

*3-smaller size tube sited over suction catheter to guide: to be used if out of hospital

The resuscitation algorithm

This patient has a
New TRACHEOSTOMY

Patient ID:

Patient Label / Details

Tracheostomy:

Add tube specification
 including cuff or inner tube

____ mm ID, ____ mm distal length

Suction:

____ FG Catheter to Depth ____ cm



Indicate on this diagram
 any sutures in place

UPPER AIRWAY ABNORMALITY: Yes / No

Document laryngoscopy grade and notes on upper airway management or patient specific resuscitation plans

Due 1st tracheostomy change: ____ / ____ / ____ (by ENT ONLY)

**In an Emergency: Call 2222 and request the Resuscitation Team and ENT surgeon
 Follow the Emergency Paediatric Tracheostomy Management Algorithm on reverse**

Bedhead Sign

Essential information

- Patient
- Tracheostomy
- Suction
- Upper airway
- Emergency plan

In an Emergency - call for help!

2222 - ENT surgeon (consultant) & Resuscitation Team

At home - 999

SAFETY, STIMULATE, SHOUT FOR HELP, OXYGEN

Emergency Paediatric Tracheostomy Management

SAFETY - STIMULATE - SHOUT FOR HELP - OXYGEN

SAFE:	Check Safe area, Stimulate, and Shout for help, CALL 2222 (hospital) or 999 (home)
AIRWAY:	Open child's airway: head tilt / chin lift / pillow or towel under shoulders may help
OXYGEN:	Ensure high flow oxygen to the tracheostomy AND the face as soon as oxygen available
Capnograph:	Exhaled carbon dioxide waveform may indicate a patent airway (secondary responders)

SAFETY – ensure you are safe to approach, stimulate the patient ‘hello’

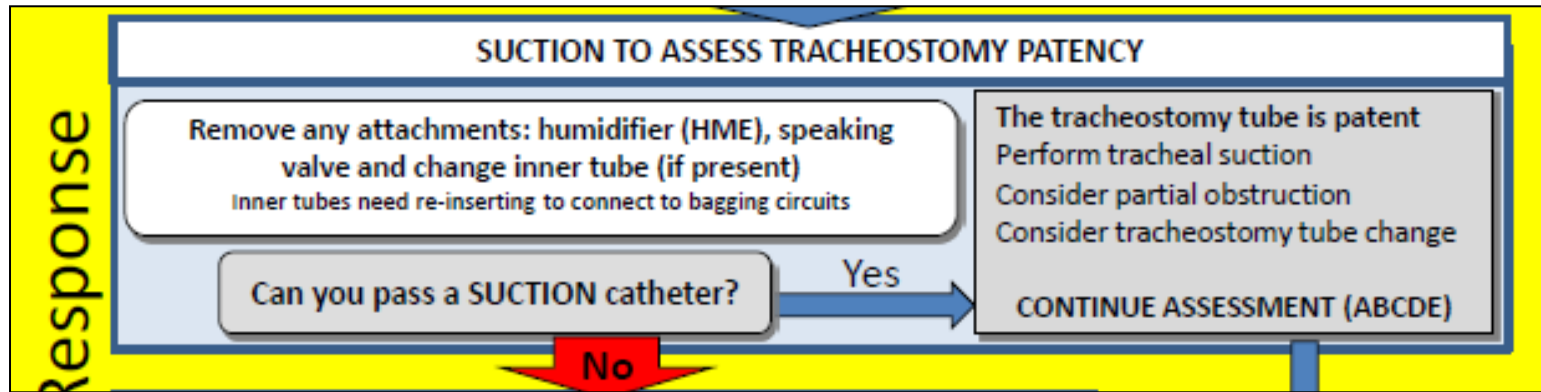
Shout for help

AIRWAY – try to get a position suitable for the child – placing a roll under the shoulders can help to open up the neck and give access to the stoma

OXYGEN – if available, high flow oxygen should be provided to the face and stoma – this will allow oxygen to get in to the lungs if there is any air movement

CAPNOGRAPH – a trained secondary responder may be able to put capnography (CO2 monitoring) in line with the tracheostomy to help assess if it is patent.

SUCTION TO ASSESS TRACHEOSTOMY PATENCY



SUCTION the tracheostomy to assess whether it is patent (unblocked).

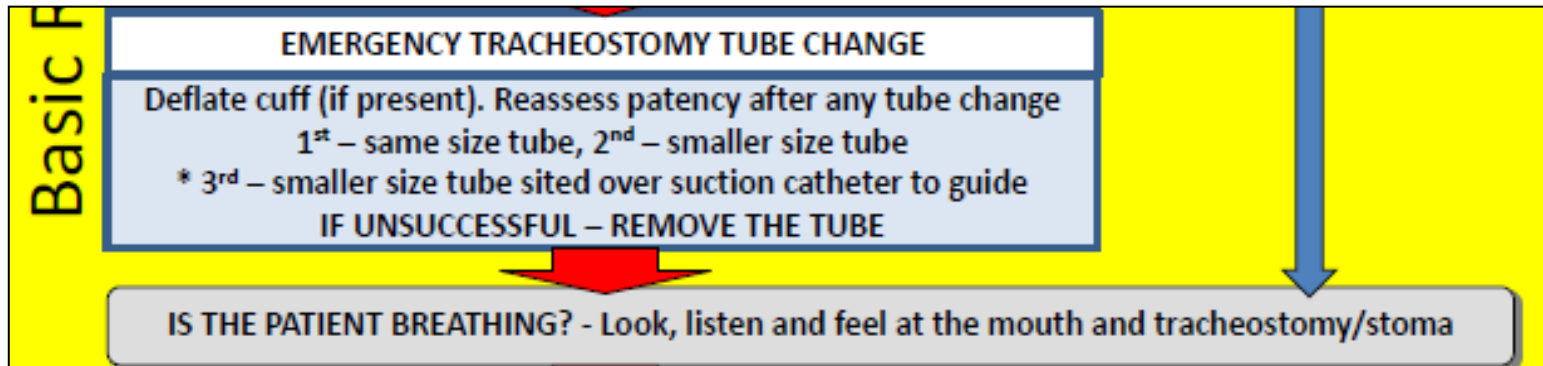
To do the suction, make sure any attachments are removed.

Humidifiers (HME), speaking valves or inner tubes can all become blocked.

Remember – if you remove the inner tube you will need to replace it with a fresh or unblocked inner tube before you can use it to bag-ventilate.

If the suction catheter doesn't pass, assume the tracheostomy is blocked.

EMERGENCY TRACHEOSTOMY TUBE CHANGE



In an emergency, if the tracheostomy is blocked – you must remove it.

Once the tracheostomy is removed, you must then replace it with a suitable tube.

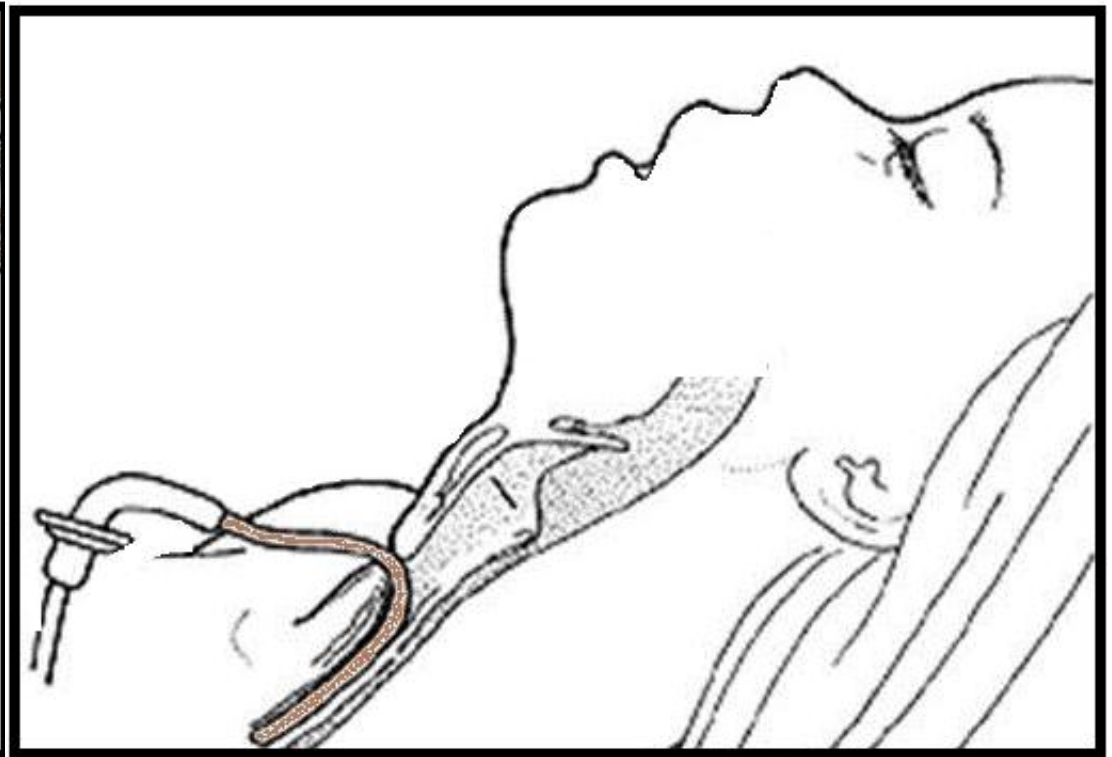
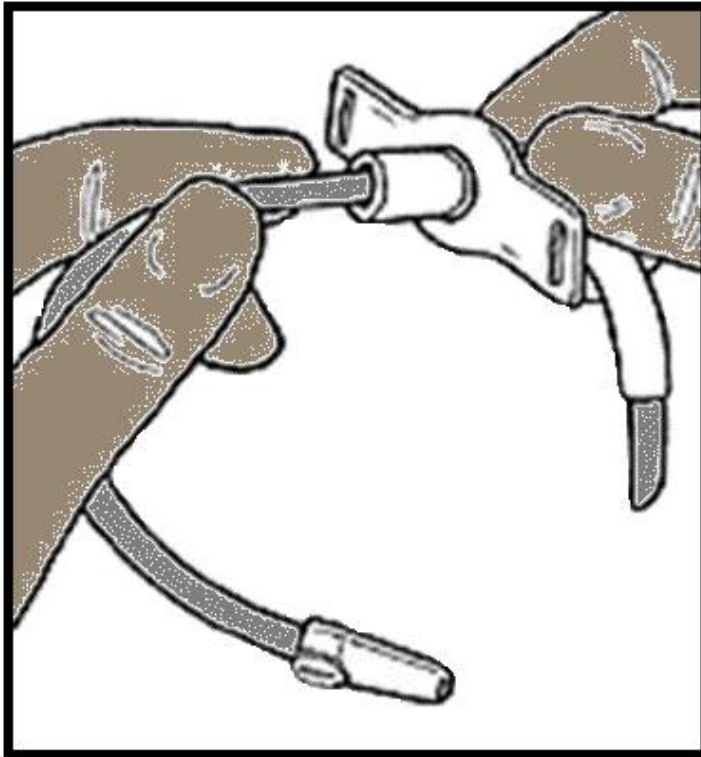
In an established tracheostomy, start by attempting to place the same size tube.

If this won't pass, then try the size smaller from your emergency TRACHE box.

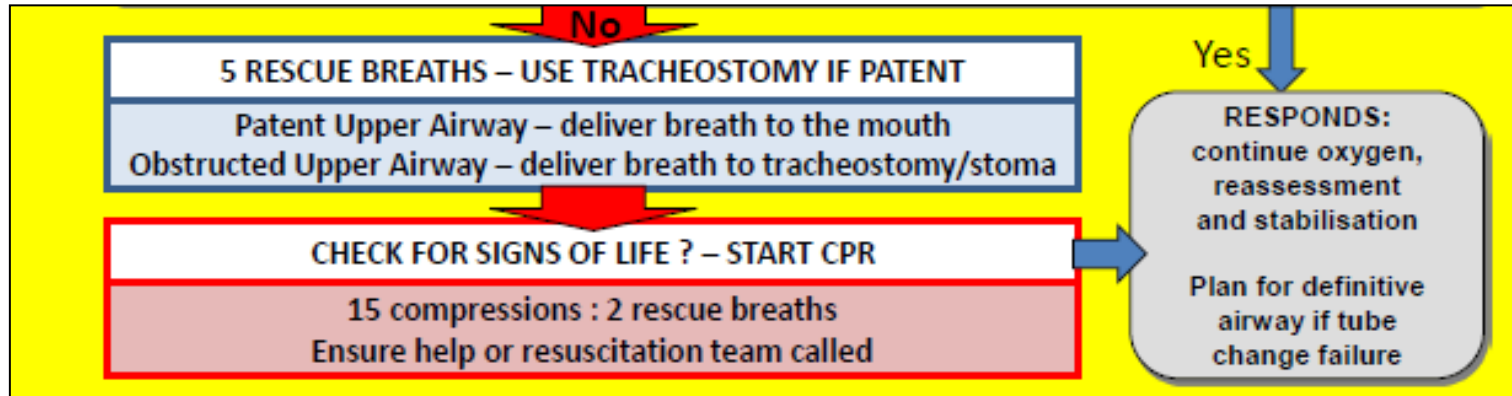
If unsuccessful, you can try passing the smaller tube in over a suction catheter being used as a guide (& try spreading the skin either side of the stoma).

IF YOU CAN'T GET A TUBE IN QUICKLY, DON'T KEEP TRYING, REMOVE THE TUBE AND MOVE ON TO ASSESSING BREATHING

Suction catheter guided tube change



RESCUE BREATHS AND CPR



If the patient isn't breathing adequately, give **5 rescue breaths**

May use UPPER airway (mouth/nose) but if this is ineffective you can also use the TRACHEOSTOMY or DIRECT STOMA with a small face mask / LMA

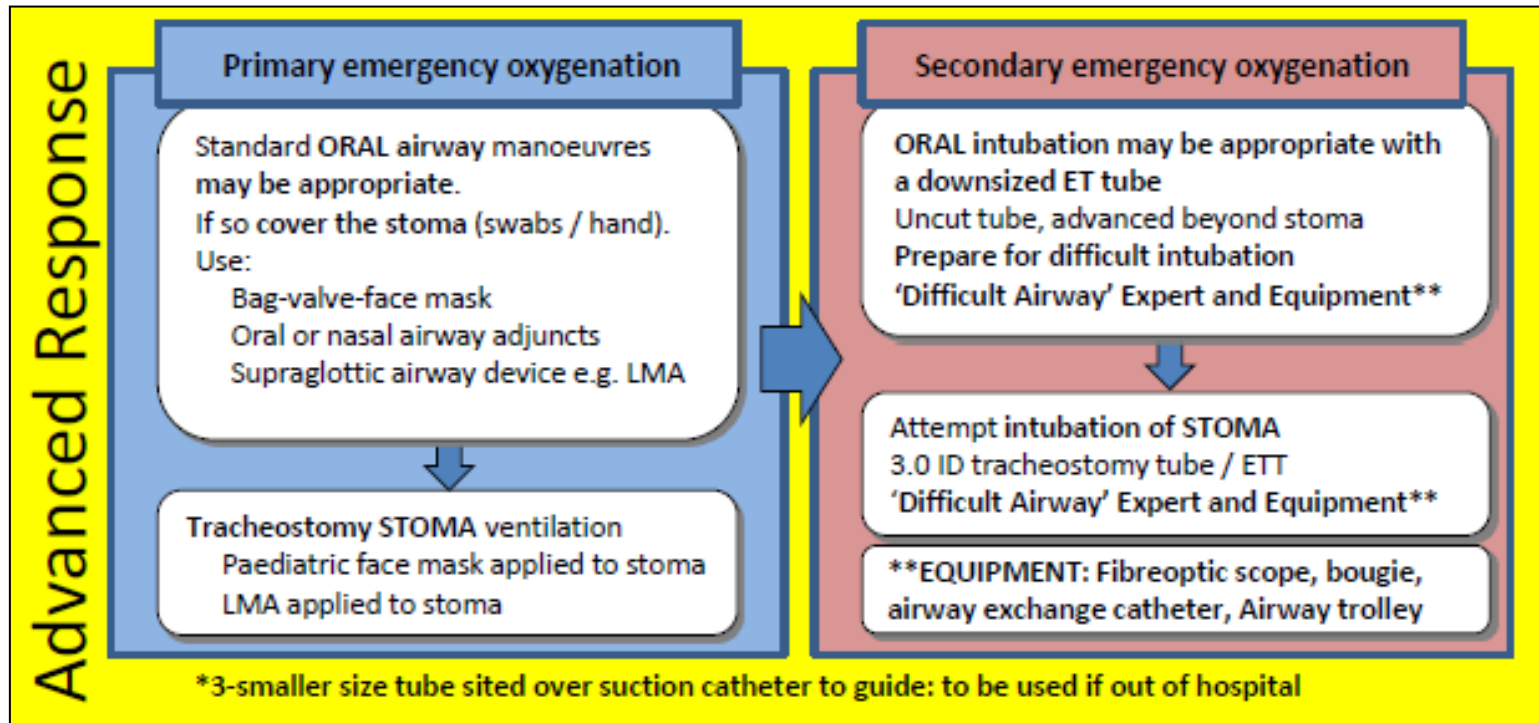
CPR should be started if the child is not showing signs of life or if Heart Rate <60

Continue CPR and make sure the resuscitation team or 999 emergency services are contacted

If the patient responds to the treatments, continue giving oxygen

Observe closely and check for any developing problems.

ADVANCED RESPONSE



The Advanced response **prioritises ways to administer OXYGEN**. This can be to the upper airway or through the stoma. Once a trained assistant attends, the process of intubating the upper airway or stoma can be attempted if safe.

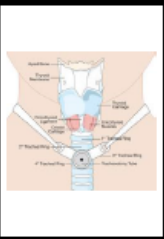
Additional equipment should be available in the Emergency Department or intubating areas in the hospital.

This patient has a TRACHEOSTOMY

Patient ID :

Tracheostomy: Add tube specification including cuff or inner tube
_____ mm ID, _____ mm distal length

Suction: FG Catheter to Depth _____ cm



UPPER AIRWAY ABNORMALITY: Yes / No please give details of any expected difficulty

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 airway if tube
 change failure

Basic Response

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Established Tracheostomy Bedhead Sign

A combined form with a bedhead sign and the Basic Response algorithm in one place which is easy to see and access. A copy of this can be kept in the TRACHE box.