Percutaneous Needle Cricothyrotomy - Full Paediatric Clinical Guideline – Joint Derby & Burton

Reference no.: CH CLIN C09

1. Introduction

This procedure is only to be carried out in the following clearly defined circumstances by APLS/PALS certificate holders or medical staff.
Standard methods of opening the airway, including repositioning of the head and jaw, the use of oropharyngeal or Nasopharyngeal airways and tracheal intubation MUST all have failed to establish a patent airway prior to consideration of cricothyrotomy and then cricothyrotomy may only be useful if there is complete upper airway obstruction caused by:

* Foreign bodies
* Infection
* Laryngeal fractures
* Severe orofacial injuries

It is an **absolute last resort**, in an emergency 'can't intubate, can't ventilate' situation. When indicated it should be performed without delay.

It is difficult to palpate the cricothyroid membrane in children aged < 5 years. APLS recommends that needle techniques are not considered as first line surgical airways in children under 5 years. Alternatives for infants include emergency tracheostomy, with direct visualisation of the tracheal wall.

The Consultant ENT surgeon and Anaesthetic Consultant should be called to attend urgently if not already present, as a child requiring a needle cricothyroidotomy will need a definitive airway.

2. Main body of Guidelines

Equipment required

14 gauge (orange/brown) or 16 gauge (grey) venflon
Mediswabs
8.5mm Paediatric Y connector (size 3.5mm)
3mm (15 male – 8.5 female) catheter mount
Tape
5ml syringe
Towel
Bag - valve-mask (BVM) device of correct size

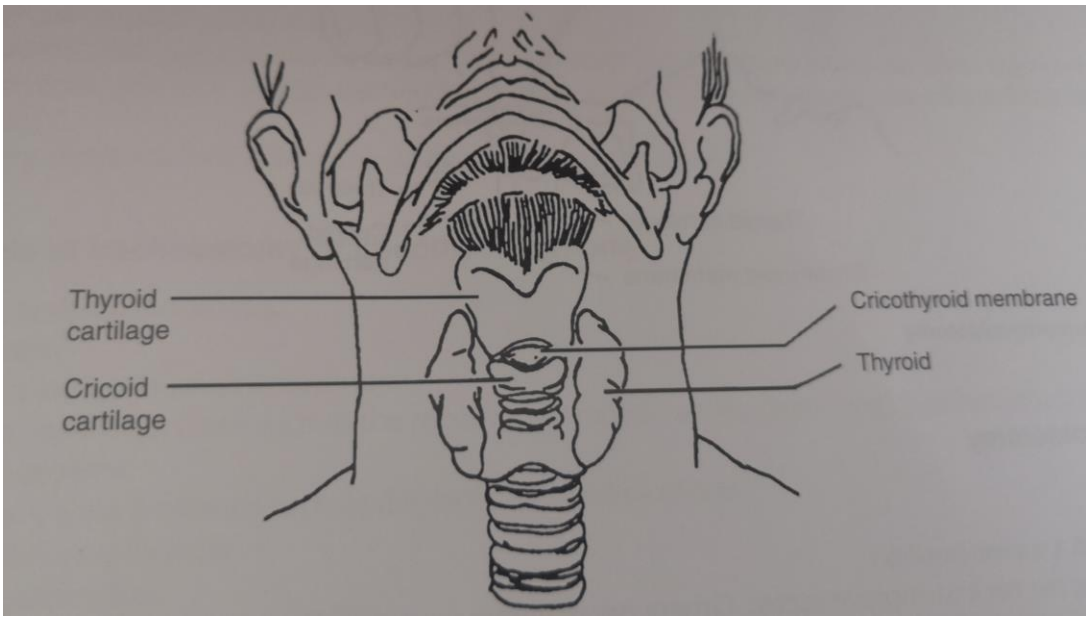

Figure 1 Surgical airway anatomy (APLS, 6th edition)

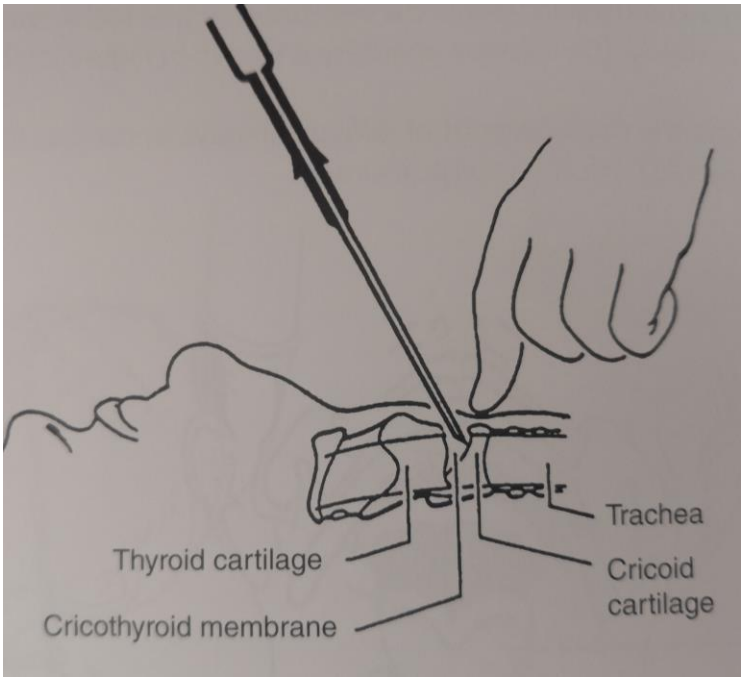

Figure 2 Needle cricothyroidotomy (APLS, 6th edition)

Procedure

1. Briefly explain to any relatives the procedure to be attempted
2. Explain to the child exactly what is to occur, they're likely to be frightened
3. Place the child supine
4. Consider extending the neck to improve access (this procedure is only done in a dire emergency and c-spine protection is of secondary importance)
5. Attach the 14 (or 16) gauge cannula to a 5mL syringe
6. Identify the cricothyroid membrane, between the thyroid and cricoid cartilages (see image above) by palpation
7. Prepare the neck with a 70% alcohol impregnated swab

8. Aim the cannula in a caudal direction, at an angle to the skin of ~45°, aspirating on the syringe while advancing (see image above)
9. Always ensure the needle is advancing in the midline
10. Confirm the position by aspirating air, then advance the cannula over the needle
11. Attach the hub of the cannula to either an oxygen flow meter via a y-connector or a adjustable pressure-limiting device. NB: the pressure release valve on an anaesthetic machine means that the common gas outlet on the machine is unsuitable as the gas supply
12. Set the flow rate, starting with flow in litres/min = age in years
13. Oxygenate by occluding the open end of the Y connector with a thumb for 1sec to direct gas into the lungs. If this does not cause the chest to rise, the oxygen flow rate should be increased by increments of 1L and reassess
14. Observe the chest movements and auscultate to assess for adequate gas entry
15. Allow passive exhalation (via the upper airway) by taking the thumb off for 4 seconds
16. Constantly check the neck to exclude cannula misplacement, i.e. subcutaneous emphysema
17. Secure the equipment to the patient's neck
18. Urgently arrange to proceed to a more definitive airway if more skilled help has arrived

Please follow hyperlink which contains a video on how to do the procedure: Cricothyroidotomy | Paediatric Emergencies

Complications

- Asphyxia
- Aspiration of blood or secretions
- Haemorrhage or haematoma
- Creation of a false passage into the tissues
- Surgical emphysema
- Pulmonary barotraumas
- Subglottic oedema or stenosis
- Cellulitis
- Oesophageal perforation
- Pneumothorax or pneumomediastinum
- Damage to lateral structures, e.g. the recurrent laryngeal nerves, carotid sheath
- Pulmonary oedema

3. Documentation Controls

Reference Number CH CLIN C09	**Version:** 5.0.0		**Status** Final	
Version / Amendment History	Version	Date	Author	Reason
	5.0.0	Jun 2023	Dr G Robinson	Review & update
Intended Recipients: Paediatric ED Consultants & Nursing staff at Derby & Burton				
Training and Dissemination: Cascade the information via BU newsletter and address training				
Development of Guideline: Dr G Robinson, Consultant Paediatrician CED				
Consultation with: Derby and Burton ED Consultants				
Linked Documents: (Nice guidance/Current national guidelines)				
Keywords: Percutaneous, Cricothyrotomy				
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Contact for Review			Dr G Robinson	