Document Conception	
Document type	Clinical Guidance
Document name	STPN Emergency Airway Clinical Guidance
Document Audience	All clinical teams involved in either elective or emergency airway management of paediatric patients across STPN sites, including anaesthetists, ENT surgeons, and multidisciplinary teams in ED, PICU, theatres, and wards.
Summary	This guideline provides structured guidance on recognising, planning for, and managing difficult airways in paediatric patients. It is applicable to all staff involved in airway management, as outlined above. It applies across all STPN acute sites.
Reason for development	To address the challenges in managing unanticipated paediatric airway emergencies, which, although rare, carry high morbidity and mortality risks. The guidance responds to national safety data; The National Audit Project 4 (NAP4), the Health Services Safety Investigations Body (HSSIB), APRICOT Study, and the British Journal of Anaesthesia (BJA) 'Airway management in neonates and infants', highlights from the Pedis registry, and identifies the need for standardisation across STPN sites, including identifying red flags for a difficult airway, early ENT involvement, consistent equipment availability, and structured training.
Document Benefits	
Key Improvements / Benefits	• Standardised approach to difficult paediatric airway management across STPN • Clear criteria for identifying high-risk patients and red flags • Emphasis on oxygenation and early planning for failure • Guidance for the use of video laryngoscopy, supraglottic airways • Early ENT collaboration • Improved team communication, leadership roles, and use of cognitive aids • Inclusion of practical tools (checklists, trolley contents, algorithms) • Recommendations for training and simulation to build workforce confidence
Project Evaluation	
Evaluation	The impact of this guidance will be monitored across the STPN through standardised audit, incident review, and feedback from airway emergency events within participating Trusts.
	Outcome measures will include first-pass intubation success, number of attempts, and complications such as desaturation, aspiration, oesophageal intubation, and airway-related morbidity or mortality.
	Process measures will include first-line use of video laryngoscopy, checklist utilisation, time to intubation, and early escalation for help. Structural measures will include equipment availability, consistently stocked airway and MAST trolleys, and readiness of emergency airway resources.
	Data collated centrally by the STPN Difficult Airway Task and Finish Group will evaluate adherence and variation across the network, with simulation, training feedback, and shared learning informing ongoing system-wide quality improvement and educational priorities.
Implementation / Recommendations: Next Steps	
For the Emergency Airway Clinical Guidance to be effective across the network, it must be widely circulated so that all clinical staff involved in responding to this emergency are familiar with the agreed standards. The network will support this through education and training.	
Step 1	Each Trust should align local guidelines and policies with the principles set in this document.
Step 2	STPN identifies training and workforce needs.
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South Thames Paediatric Network
Emergency Airway Guidance

1. Overview

An unexpected difficult airway in paediatric anaesthesia is a rare occurrence. However, outcomes can be significantly improved by obtaining a thorough history, conducting an appropriate airway assessment and examination, and ensuring adequate preparation of equipment and personnel. Adhering to a structured, stepwise approach is essential. All anaesthetists bear a responsibility to be familiar with recognised airway management algorithms and to understand local resources and expertise, including availability, limitations, and response times, to make informed and pragmatic decisions when necessary. Anaesthetists who do not routinely care for paediatric patients encounter challenges more frequently.

Due to the unpredictable nature of airway emergencies, robust evidence for best practice is difficult to obtain. As a result, many current guidelines are based on expert consensus rather than high-level evidence.

The **Paediatric Difficult Intubation (PeDI) Registry** compiles prospectively collected data on tracheal intubation from 13 children's hospitals in the United States. Among 1018 recorded episodes, the data demonstrated that **more than two attempts at direct laryngoscopy** in children with a difficult airway were associated with a high rate of failure and a significantly increased incidence of severe complications.

Incidence data (from NAP4 and the APRICOT study)

How frequently might we encounter a difficult airway?

Unanticipated difficult intubation occurs in approximately 0.4% of cases. It is more common in emergencies, with the **highest incidence in children under one year** of age.

The incidence of impossible mask ventilation is approximately 0.15%, with **non-paediatric anaesthetists** encountering this more frequently.

Although these occurrences are rare, failed intubation still occurs in 2% of affected cases, with a high associated morbidity rate of 20%.

Adverse Events:

- Predominantly respiratory events (hypoxia)
- Increased likelihood in:
  - Children weighing less than 10 kg
  - Micrognathia
  - When more than three attempts at direct laryngoscopy occurred before an alternative strategy was employed.

The **'Can't Intubate, Can't Ventilate'** (CICV) scenario is exceedingly rare, with an incidence of just 0.045%.

There is limited literature available to guide clinicians regarding appropriate equipment and techniques. It is important to recognise that current DAS (Difficult Airway Society) guidance does not cover infants under one year of age but only applies to the 1-8-year age group.

Out-of-Theatre Intubation Performance

Published data consistently demonstrates that out-of-theatre tracheal intubations (in the Emergency Department and Paediatric Intensive Care Unit) have lower first-pass success rates and higher complication frequencies compared to planned anaesthetic or operating theatre settings.

Across multiple registries, similar findings are reported in both ED and PICU settings:

- Funakoshi et al. (Pediatr Emerg Care, 2022) – 64% success, 17% adverse events (31% with ≥2 attempts)
- Greenwald et al. (Pediatr Emerg Care, 2025; NEAR4PEM) – 72% success, 24% adverse events
- Pande et al. (J Pediatr Intensive Care, 2023) – 67% success, 24% severe adverse events
- Van Damme et al. (Pediatr Crit Care Med, 2024; NEAR4KIDS) – 59–68% success, comparable event rates across clinicians
- Lusby et al. (Anaesthesia, 2024) – UK multicentre non-theatre study – 76% first-pass success overall, falling to 62% in children <2 years, with 31% desaturation <80% and 19% requiring ≥3 attempts
- Kishida et al. (Pediatr Crit Care Med, 2025; NEAR4KIDS) – 70–81% success, 33–40% adverse events

Even in specialist centres, one in three children require multiple attempts, and complications remain frequent.

Implications for Clinical Practice

The evidence indicates that non-theatre airway management is inherently higher risk, even when performed by experienced teams.

Key contributing factors include:

- Variable operator experience and exposure frequency
- Limited access to senior or ENT support
- Environmental and equipment constraints outside theatre

2. Factors Contributing to Poor Outcomes

Evidence from the National Audit Project 4 (NAP4) and the Health Services Safety Investigations Body (HSSIB), supplemented by insights from our expert group discussions, highlighted several factors associated with adverse outcomes in paediatric airway management:

Factors associated with adverse outcomes:

- Inadequate airway assessment.
- Insufficient planning, including lack of contingency plans for failure.
- Cognitive fixation and repeated attempts at intubation using the same technique.
- Inadequate monitoring, such as lack of continuous oxygen saturation and capnography.
- Delayed recognition and response to desaturation and hypoxia, often progressing to bradycardia and cardiac arrest.
- Failure to utilise a supraglottic airway device when appropriate.
- Not seeking earlier senior/ expert help and involving ENT early.

Key concepts:

OXYGENATION must always remain the central focus.

There is a need to PLAN FOR FAILURE - always!

3. Challenges in Paediatric Airway Management

Why does it feel stressful and difficult?

Airway management in paediatric patients is inherently stressful and complex due to a combination of patient-specific, anatomical, physiological, and situational factors.

3.1 Patient-Specific Factors

- The patient may be a neonate, ex-premature infant, young child, or clinically unwell.
- Many cases occur in acute or emergency airway scenarios.

3.2 Anatomical Considerations (aged 0-2 years)

- Prominent occiput: lying flat can cause neck flexion and airway obstruction.
- Anterior and higher-positioned larynx.
- Longer, more compliant ('floppier') epiglottis.
- Relatively large tongue in proportion to the oral cavity.

3.3 Physiological Considerations

- Rapid desaturation due to low functional residual capacity (FRC).
- Increased reliance on type II (fast twitch) respiratory fibres, which fatigue quickly.
- Predisposition to small airway collapse and basal atelectasis.
- Higher risk of gastric insufflation during mask ventilation, which can splint the diaphragm and further reduce FRC.
- These factors may precipitate a rapid deterioration with difficulty in ventilation and oxygenation.

3.4 Environmental and Situational Factors

- Airway interventions often occur in unplanned or emergency contexts.
- Events may take place outside of the operating theatre, in unfamiliar environments.
- Use of unfamiliar or limited equipment.
- Involvement of non-paediatric anaesthetists, particularly when on general on-call rotas.

3.5 Team Experience and Confidence

- Variability in team familiarity and confidence when managing infants and children.
- Experience with Babies, Children, and Young People (BCYP) is essential and impacts decision-making and outcomes.
- Utilise the team experience available to you; this includes Anaesthetists, as well as Neonatal and Paediatric Consultants.
- Paediatric / Neonatal senior members of the team may be more experienced and confident in managing airways in neonates and babies under 3 months of age.

4. Oxygenation and Basic Preparation

The importance of **preparation** for paediatric airway management, with emphasis on **oxygenation** and essential airway techniques cannot be over-emphasised. **The key steps for maintaining oxygenation:**

POSITIONING

- Achieve a neutral head position to optimise airway patency
- Use a head ring and/or shoulder roll in infants and small children

FACE MASK

- Select an appropriately sized face mask to ensure a tight seal and effective ventilation

OROPHARYNGEAL AIRWAY

- Insert a correctly sized oropharyngeal airway to maintain airway patency

NASOGASTRIC TUBE (NGT)

- Insert an NGT prior to induction
- Connect to a 50 ml syringe for constant aspiration to prevent gastric insufflation

VENTILATION

- Use a T-piece circuit with PEEP to support ventilation

5. Assessment of High-Risk Airways in Paediatric Patients

5.1 Recognition of Red Flags
Identifying a high-risk airway is critical for safe and effective paediatric airway management. Key indicators include:

Red Flags

Acute trauma, infection, mediastinal mass, or burns
Congenital neck or airway masses (e.g. cystic hygroma)
Congenital or acquired anatomical abnormalities
History of extreme prematurity with risk of subglottic stenosis
Known Tracheomalacia
Limited cervical spine mobility
Macrosomia (e.g. metabolic storage diseases, mucopolysaccharidoses such as Hunter and Hurler syndromes): associated with both difficult mask ventilation and intubation
Micrognathia (e.g. Pierre Robin sequence, Treacher Collins syndrome, Goldenhar syndrome): associated with difficult intubation
Midface hypoplasia and facial asymmetry (e.g. Crouzon, Apert syndromes): associated with difficult mask ventilation
Obesity
Obstructive Sleep Apnoea (OSA), particularly due to tonsillar hypertrophy
Parental report of known or suspected difficult airway
Presence of a foreign body
Previous documentation of difficult airway in the patient record
Restricted mouth or jaw opening
Signs of respiratory compromise (e.g. stridor, hypoxia, respiratory distress)
Systemic illness (e.g. sepsis, cardiomyopathy, cardiac failure, shock)
Tracheo-oesophageal Fistula (TOF)

Identify red flags early
A thorough history and examination remain the most effective tools for risk recognition.

Questions to ask yourself and to communicate clearly to the team:

1. **Is senior expertise required from the outset?**
   Consider whether you need more experienced hands at the very start of induction and first intubation attempt? e.g. **Consultant Anaesthetist, Consultant ENT Surgeon.**
2. **Is all necessary equipment available and checked?**
   Prepare and check difficult airway equipment, including difficult airway equipment that ENT colleagues may require.
3. **Consider the most appropriate setting for the airway intervention?**
   Determine whether the patient is safe to be transferred to theatre and whether they can be transferred to another centre. Close collaboration with the South Thames Retrieval Service (STRS) is needed throughout.
4. **What is the rescue strategy if intubation fails?**
   Consider whether the child can be awakened or if surgical tracheostomy will be required.

Maintain oxygenation at all times
Always plan for failure
Consider early help from ENT

6. Structured Intubation Planning

Please refer to **Appendix B** for the STPN Paediatric Emergency Intubation Airway Management Algorithm, aligned with DAS guidance.

6.1 Form a plan

1. **Patient assessment**
   Review the child's history and conduct a thorough physical examination.

   Ask yourself:
   - Could this child have a difficult airway?
   - Are there any red flags?
   - Do I need a Consultant Anaesthetist and/or Consultant ENT Surgeon involved immediately or is having them on-site sufficient?

2. **Evaluate local resources**
   - What staff and equipment are available?
   - What additional support or tools are needed?

3. **Develop a Difficult Airway Strategy**
   - Clearly outline Plan A, B, C, and D
   - Ensure all team members understand the plan
   - **Plan for failure**

4. **Oxygenation**
   - Prioritise maintaining oxygenation throughout

Plan A – tracheal intubation

Not > 2 attempts before changing operator or technique
Not > 4 attempts total
Check: Neck flexion and head extension
Laryngoscopy technique
External laryngeal manipulation (remove or adjust)
Vocal cords open (adequate paralysis)

Plan B – rescue oxygenation SGA

Not > 3 attempts
Maintain oxygenation between attempts
Change device, size, operator
If successful and safe, consider FOI via LMA

Plan C – rescue oxygenation facemask

Convert to facemask, oxygenate and ventilate
Optimise head position
2-person bag-mask technique, CPAP, oro/nasopharyngeal airway
Manage gastric distension with OG/NG tube
Reverse non-depolarising relaxant

Plan D – emergency FONA

Airway plan, as per DAS CICV 1-8 years flowsheet; refer to **Appendix B.**

6.2 Core Principles for Paediatric Airway Preparation

- Always assume the potential for a difficult airway and prepare accordingly.
- Take a detailed history and examine thoroughly for red flags.
- Ensure early involvement of appropriate expertise (Consultant Anaesthetist, ENT).
- Implement full monitoring, including oxygen saturation with audible tone, heart rate, blood pressure.
- Use of capnography throughout.
- Establish team roles and leadership clearly.
- Use the HELPKIDS team briefing safety checklist, adapted from the Evelina Paediatric Critical Care Intubation Guideline (**see Appendix B**).
- Prepare airway adjuncts (e.g. oropharyngeal airways, face mask, supraglottic airway device, anaesthetic T-piece with PEEP).
- Optimise head position with head ring or shoulder roll to achieve neutral alignment in infants.
- Insert a nasogastric tube and aspirate continuously pre-induction.
- **Optimise success with adequate anaesthesia and early neuromuscular blockade** (if spontaneous ventilation is not essential e.g. in foreign body, stridor, severe tracheomalacia, mediastinal mass).
- Early paralysis improves intubation success and reduces complications such as laryngospasm.

7. Intubation Attempts and Modifications

- Limit intubation to **a maximum of two attempts per operator** before changing either the operator or the technique, with **no more than four attempts in total.**
- Consider removing cricoid pressure or applying BURP (Backwards, Upwards, Rightwards Pressure).
- Prioritise oxygenation between attempts. **Oxygenation is more important than intubation.**

Use:
    - Supraglottic airway (SGA) as a rescue
    - **or** back to basic airway techniques (mask)
- **If initial approach fails, change technique:**
    - Use video laryngoscopy (VL)
    - Escalate to more senior personnel
    - Consider fibreoptic bronchoscopy and consider seeking ENT support

8. Video Laryngoscopy (VL) Considerations

The STPN endorse Video Laryngoscopy (VL) as a first-line technique.

This recommendation is based on current evidence.

8.1 Direct Laryngoscopy vs Video Laryngoscopy

Consider what are you most familiar with, and what is your plan B? For example, a known difficult airway will have higher success with VL. VL can provide excellent laryngeal views and allow team visualisation but may complicate tube passage.

In cases with known difficult airway (e.g. an anterior larynx in Pierre Robin), consider VL with a hyper-angulated blade as first-line.

Use a stylet, particularly those under 3 months of age to pre-form the endotracheal tube (ETT) when:

- Using hyper-angulated VL
- The larynx is anterior

The STPN support the use of VL, but ensuring a range of blade types and sizes is important, alongside a robust plan for training - an essential prerequisite for the correct use of VL.

Support the routine use of VL in daily practice to improve competence, confidence and familiarity.

Always have a backup plan if VL is unsuccessful.

8.2 Additional Recommendations

- Use a **bougie or stylet** for limited airway views or in smaller ETT sizes.
- Monitor **ETT cuff pressures** carefully- avoid over-inflation.
- Contact ENT **prior to induction** if red flags are identified to confirm their proximity and readiness.
- Engage **STRS early** for consultation and potential transfer arrangements.
- Follow **Difficult Airway Society (DAS) guidelines (see Appendix C) and algorithms** throughout.

9. Essential Equipment for Difficult Airway Management

All clinical sites managing paediatric patients must have immediate access to the following equipment for the management of difficult airways:

- **Video Laryngoscope (VL)** with a variety of **blade sizes.**
- **Hyper-angulated blade** compatible with VL system.
- **Flexible intubation scope** or **rigid/semi-rigid scopes**, including appropriate sizes for the patient's age.
- A full range of **supraglottic airways (SGAs).**
- A full range of **face masks** of varying sizes.
- A full range of **cuffed and uncuffed ETT sizes** and **oropharyngeal airways.**

- A **nasopharyngeal airway** can also be helpful in the case of large tonsils and/or adenoids and can facilitate suctioning.
- Ensure good suction is available.

See **Appendix B** for the Kit Dump: Print this template in A3, laminate, and use as a mat for laying out key anaesthetic equipment. This visual aid supports consistency and helps less experienced team members assisting an Anaesthetist.

9.1 Location of Equipment:

- It is essential **that all staff are familiar with their local site layout** and understand **where key emergency airway equipment is located.** This is often in theatres; however, consideration should be given to how other clinical areas, such as the Emergency Department or paediatric wards, can rapidly access this equipment when required.
- **Every site** that may encounter an acutely unwell child or a child undergoing anaesthesia **must have access to appropriate emergency airway equipment** and ENT equipment, within the Trust.
- The **paediatric emergency airway trolley** must be consistently located (e.g. in theatres, paediatric wards, or emergency departments), and **all staff must be aware of its exact location.**
- In addition, the STPN endorse the use of an ENT trolley with dedicated airway equipment, such as the MAST Trolley. If this is not available, a locally developed ENT Difficult Airway Trolley should be maintained, and its location clearly communicated.

Appendix D provides a practical reference table for airway equipment sizing and assists operators in understanding equipment compatibility and fit.

10. ENT Network and Emergency Airway Support

When a difficult airway is identified, the ENT team should be contacted immediately.

A robust, reliable, and rapid method of reaching the ENT team is essential during any paediatric or neonatal airway emergency. Communication systems must enable immediate access to ENT support without delay. Examples of effective contact methods include:

- Hospital switchboards holding the direct mobile phone numbers of the **on-call ENT Consultant** and **Resident ENT doctor**, allowing rapid and seamless connection for emergency calls **(see Appendix E** for contact details of ENT teams across the STPN).
- A designated **paediatric airway emergency bleep or phone** carried by the **ENT on-call team**, to ensure direct and prioritised contact in time-critical scenarios.

10.1 Recommendations for Hub and Spoke Models

In hospitals operating under a **hub-and-spoke model**, it is strongly advised that **spoke hospitals** maintain direct access to ENT contact details as outlined above. This ensures that a further transfer call to the hub site is not required, thereby avoiding unnecessary delays during a time-critical airway emergency. See **Appendix E** for full contact list.

11. Role of ENT in Airway Emergencies

The extent of ENT team involvement will vary depending on the **underlying cause** of the airway emergency and each unique case. Regardless of the scenario, all required **ENT difficult airway equipment** must be readily available, well-organised, and stored systematically. Refer to **Appendix F** for the STPN's recommended designs, contents, and layouts for both the Emergency Airway Trolley used in general anaesthesia and the ENT Emergency Airway Trolley.

A highly effective example is the **Make Airway Safe Trolley (MAST)**, developed by the paediatric ENT team at Southampton Hospital. This trolley allows scenario-specific drawer access and rapid mobilisation of equipment. The STPN ENT Emergency Airway trolley is based on this design.

11.1 Essential ENT Equipment for Paediatric Airway Emergencies

Airway Visualisation Tools

- **Hopkins telescope**: 2.7 mm diameter, 18 cm length, with compatible light clip and light cable
- **Benjamin Lindholm laryngoscope**: infant and child sizes

Ventilating Bronchoscopy Equipment

- Bronchoscopes: Sizes 2.5, 3, 3.5, 4, 4.5, 5, and 6
- Compatible bronchoscopic bridges
- **Flexible suction** catheter suitable for insertion through bronchoscope
- **Injection cannula**
- **Prismatic light detector**

Foreign Body Removal Kit

- **Hopkins telescope**: 2.9 mm, 36 cm, 0-degree
- **Optical forceps**: including alligator, peanut grasping, 2x2 toothed (suitable for coin retrieval), and standard alligator forceps

Paediatric Tracheostomy Equipment

- No. 10 **scalpel blade**
- **Bipolar diathermy forceps**
- **Surgical scissors** (e.g., baby Metzenbaum or tenotomy scissors)
- **Retractors** (e.g., skin hooks, cat's paws, Langenbeck retractors)
- **Tracheostomy dilatation forceps**
- A full **range of tracheostomy tubes**, including paediatric and neonatal lengths, sizes 2.5 to 5.5
- **Tracheostomy ties** and **foam dressings**

See **Appendix F** for detailed trolley design, equipment list and layout.

12. DAS Guidelines

Management strategies should be based on **Difficult Airway Society (DAS)** algorithms (**see Appendix C**). These should be readily accessible in clinical areas, particularly for:

12.1 Difficult Mask Ventilation *(to access the algorithm, please click on the title)*

Factors contributing to difficult mask ventilation include:

- **Patient Factors:**
  - Poor head positioning (early use of head ring/shoulder roll)
  - Large adenoids or tonsils
  - Obstruction due to cricoid pressure
  - Inadequate anaesthetic depth causing laryngospasm (deepen anaesthesia and use early muscle relaxation)
  - Gastric inflation (insert and aspirate via nasogastric tube)
  - Syndromes

- **Equipment Checks:**
  - Functional mask, circuit, and oxygen supply
  - Always have a **self-inflating bag** as backup

- **Interventions:**
  - Adjust head position (add/remove support)
  - Chin lift/jaw thrust
  - Apply PEEP
  - Adjust or release cricoid pressure
  - Insert oropharyngeal airway
  - Deepen anaesthesia and administer muscle relaxant
  - Use **two-person** mask technique
  - Insert **NGT to deflate stomach**
  - Insert SGA or proceed to intubation

12.2 Difficult Tracheal Intubation *(to access the algorithm, please click on the title)*

- Limit intubation to **a maximum of two attempts per operator** before changing either the operator or the technique, with **no more than four attempts in total**
- Avoid repeating unsuccessful techniques (to prevent trauma and oedema)
- **Oxygenation must be maintained throughout** all attempts

If the first attempt fails:

- Change the intubator or escalate to a more senior clinician
- Reposition the patient
- Change equipment (e.g., switch from direct laryngoscopy to VL)
- Ensure adequate depth of anaesthesia and paralysis
- Use BURP (Backward, Upward, Rightward Pressure)
- Preform the ETT with a stylet; use a **bougie** if view is limited
- **Contact ENT** for bronchoscope assistance
- Use **SGA, facemask, oropharyngeal airway** to maintain oxygenation

See **Appendix C** for full details.

Focus on oxygenation:

- Use SGA, facemask, oropharyngeal airway to maintain oxygenation
- Insert NGT and aspirate to reduce gastric insufflation
- Laryngeal mask airway (SGA) can be incredibly effective at supporting oxygenation
- Utilise existing therapies - continue Opti flow or non-invasive ventilation (NIV) to maintain stability prior to intubation, and even in between intubation attempts or waiting for help to arrive
- If oxygenation can be maintained, take a hands-off approach, and wait for further support to arrive, for example await ENT arrival

12.3 Can't Intubate, Can't Ventilate *(to access the algorithm, please click on the title)*

13. Can't Intubate, Can't Ventilate

Management should follow the DAS and STPN eFONA (Emergency Front of Neck Access) guidance, provided as a separate document (**see Appendix G**), which is a guidance document. An expert group within the STPN has developed this guidance, informed by the most current evidence available. The document includes visual prompts and stepwise actions.

Key Points:

- A thorough history and examination are essential prior to induction
- Consider **early ENT involvement** where red flags are identified
- Be prepared before induction if a **surgical airway may be required**
- Recognise critical signs:
  - **SpO_2 < 80%**
  - **Heart rate decreasing**
- In infants and small children, **surgical tracheostomy** may be more successful than **needle cricothyroidotomy** or other forms of eFONA.

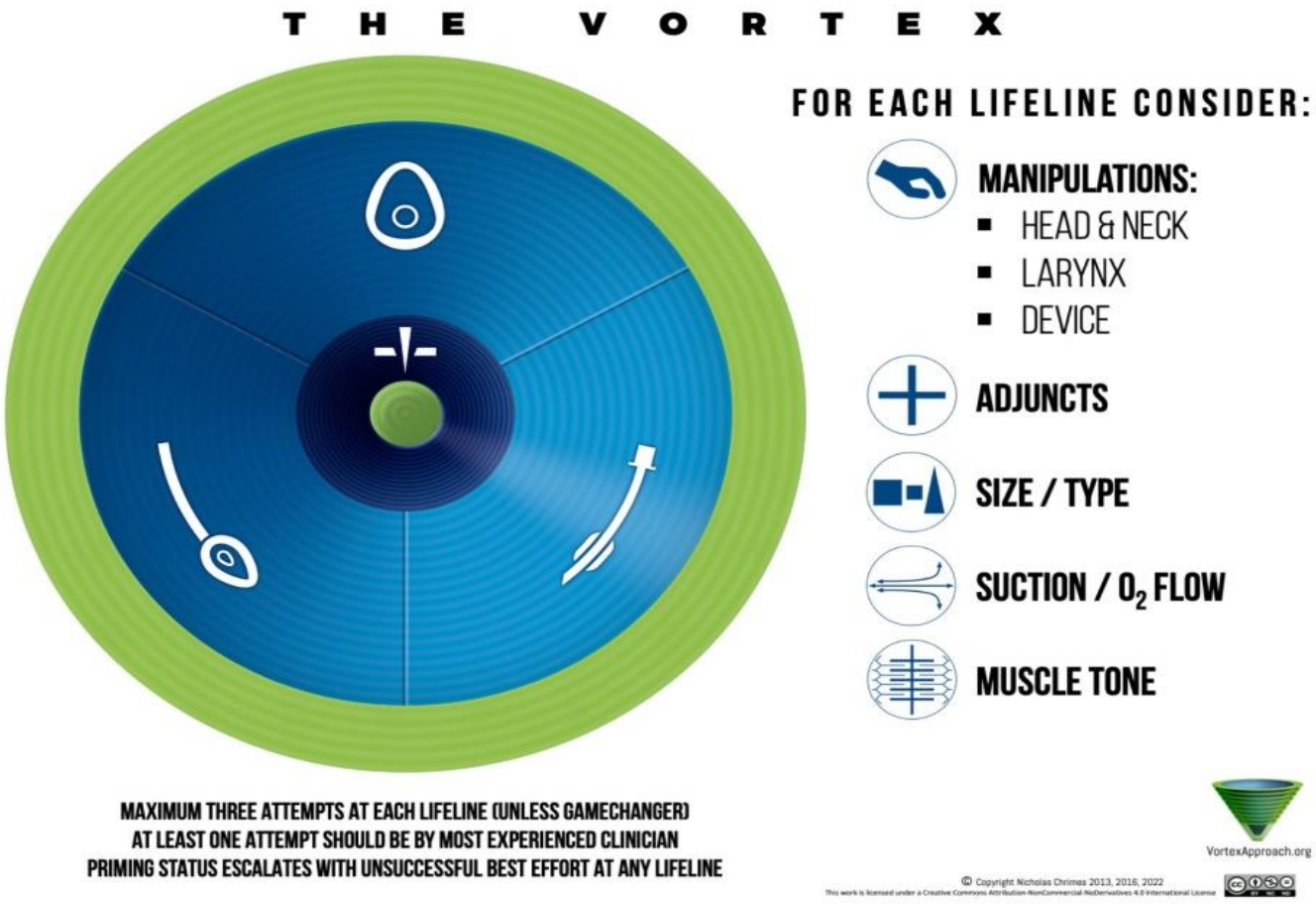
Performing eFONA is a rare and stressful position to be in. Preparation in the form of pre-made packs is recommended. Pack contents labels are provided in **Appendix H**. They should be printed and affixed to the packs placed in the Emergency Airway Trolley, to ensure that, in the event of Emergency FONA, all appropriately sized equipment is readily available.

14. Stabilisation and Transfer

If the child is considered stable for transfer to another hospital for further airway management, or requires transfer after the airway has been secured, the STPN Pre-Transport Checklist (see **Appendix I**) should be used to support stabilisation and optimisation before transfer. Early liaison with STRS is recommended to coordinate a safe onward transfer.

15. Human Factors and the Vortex Approach

15.1 Vortex Cognitive Aid



Source: Chrimes N. *The Vortex Approach to Airway Management.* © Nicholas Chrimes 2013, 2016. Reproduced under Creative Commons Attribution Non-Commercial No Derivatives License.

The **vortex approach** is a visual and cognitive tool that simplifies decision-making during paediatric airway emergencies. It helps teams maintain situational awareness and avoid fixation.

- The **outer green zone** represents three non-surgical airway lifelines:
  - Face mask
  - Supraglottic airway (SGA)
  - Endotracheal tube (ETT)
- If one method fails, the clinician progresses in a **spiral motion** to the next lifeline.
- The **central vortex** (blue) represents failure to oxygenate (CICV), prompting consideration of **eFONA**
- The tool serves to reduce **cognitive overload**, improve **team communication**, and facilitate **timely decision-making** under stress.

15.2 Human Factors Considerations

To ensure effective performance in high-stress scenarios, teams must address the following:

- Clearly defined **team leader**
- Use of a **checklist** (**see Appendix B**)
- **Explicit role assignment** to all team members
- **Strategic pauses**, remain calm and confirmation of each step
- Allow for **stabilisation between steps**
- Conduct a **post-event debrief and clear documentation**
- Regular **simulation-based training** to reinforce learning

15.3 Debrief

Managing difficult airways in emergency situations is inherently stressful. Regardless of the outcome, teams should always be given the opportunity to debrief - both immediately after the event (hot debrief) and at a later stage (cold debrief).

16. STPN Paediatric Emergency Airway Infographic

The **STPN Paediatric Emergency Airway Infographic** (**see Appendix J**) provides a visual summary of the key principles in preparing for and managing a difficult paediatric airway in emergency settings. It is designed to complement detailed guidance by serving as a quick-reference tool for clinicians. QR codes will be included linking to more detailed sections of the document.

The infographic outlines:

- **Risk Identification**:
  - *History red flags*: prematurity, age <12 months and <10 kg, craniofacial syndromes, systemic illness, previous difficult intubation
  - *Examination red flags*: stridor, obstructive lesions, limited mouth opening or cervical mobility, facial asymmetry, obesity, or trauma
- **Preparation**:
  - Focus on oxygenation rather than a single method of intubation
  - Prepare Airway Plans A-D, following DAS guidance
  - Confirm senior support and consider early ENT involvement where risk factors are present
  - Ensure all essential equipment is checked, including appropriately sized alternatives
- **Principles of Management**:
  - Oxygenation must be prioritised at all stages
  - Avoid repeated failed techniques - change intubator, equipment, or positioning
  - Establish a clear rescue strategy, including supraglottic airway or facemask ventilation
  - In the event of “can’t intubate, can’t ventilate,” proceed without delay to front-of-neck access (FONA)

- **Team and Setting**:
  - Establish roles and leadership prior to induction
  - Confirm the appropriateness of the setting (theatre or transfer if required)
  - Liaise closely with retrieval services when relevant.

The infographic acts as a **safety net within the broader guidance**, promoting structured preparation, early escalation, and clear communication in the management of paediatric airway emergencies. Its purpose is not to replace clinical judgement but to ensure a consistent, Network-wide approach that safeguards oxygenation and optimises outcomes in high-risk situations.

17. Training and Education

To ensure clinical readiness and familiarity with key equipment and techniques, SIM and skills-based emergency airway training should be provided annually to all members of the multidisciplinary team who may be involved in emergency airway management:

Yearly updates for all members of the multi-disciplinary team who may be involved with emergency airway management:

- ED department team
- On call paediatricians
- On call anaesthetists
- On call ENT team
- Nursing Team
- Resus Team

Updates should include training on the following topics:

- Basic paediatric airway management
- Advanced paediatric airway management
- Oxygenation principles
- Use of video laryngoscopy
- ENT equipment setup
- Emergency front-of-neck access (eFONA)
- Information about emergency airway management and how to call for help should be included as part of induction sessions for all ED staff

Local in SITU simulated practice is recommended both for staff training and to identify correctable human factors in the clinical setting. Information posters placed in Emergency Departments and relevant clinical areas.

Unless there is no requirement to anaesthetise children, either for elective or emergency procedures, it is expected that the competence and confidence to treat children will be maintained. This may be via direct care, continuing professional development (CPD) activities, refresher courses or visits to other centres. This should be assured through annual appraisal and revalidation (Royal College of Anaesthetists, 2020).

STPN will work to support and supplement local education. The suggested simulation scenarios are to be developed, and once completed, STPN will distribute them:

- Foreign body aspiration
- Ex-premature infant with malacia and bronchiolitis
- Pierre Robin sequence with bronchiolitis
- Paediatric airway emergency in context of sepsis or seizures
- Smoke Inhalation/Burns.

References

This guidance has been updated in accordance with recommendations from multiple sources, including the **Healthcare Safety Investigation Branch (HSIB)**, **European guidelines for neonatal airway management (British Journal of Anaesthesia, BJA)**, and major studies and audits:

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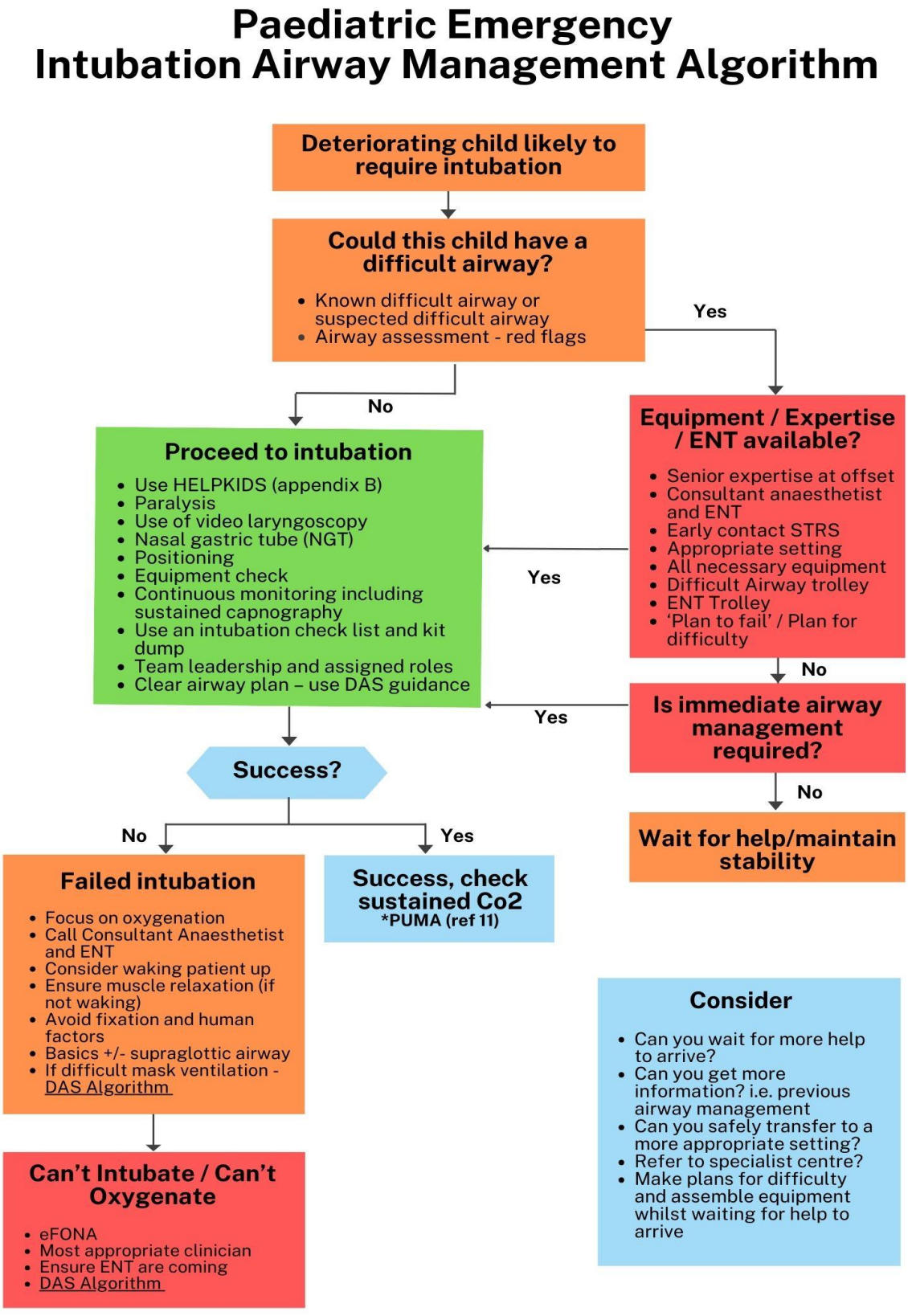
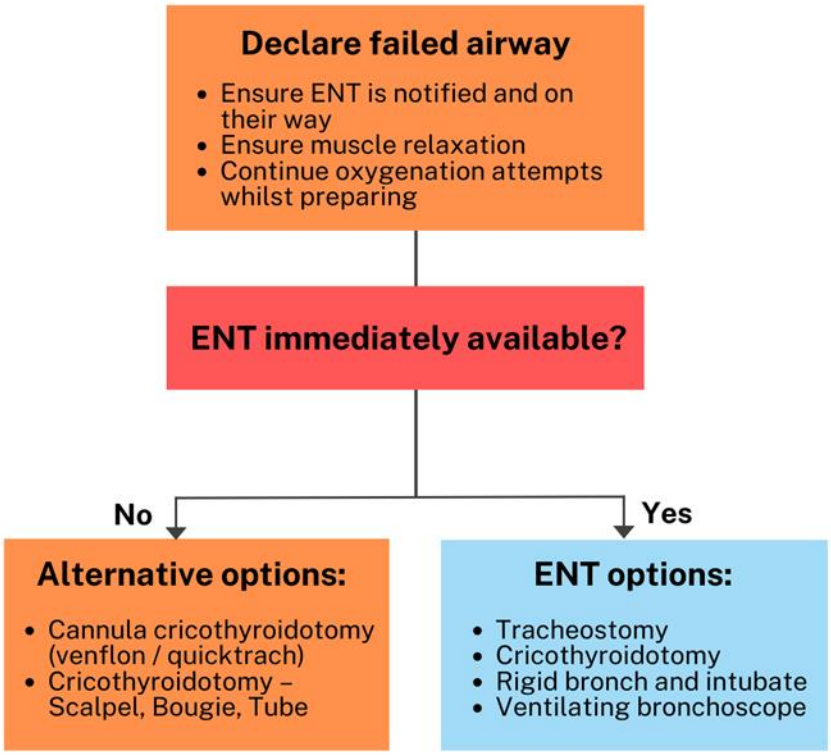
Appendices

Appendix A – STPN Paediatric Emergency Intubation Airway Management Algorithm

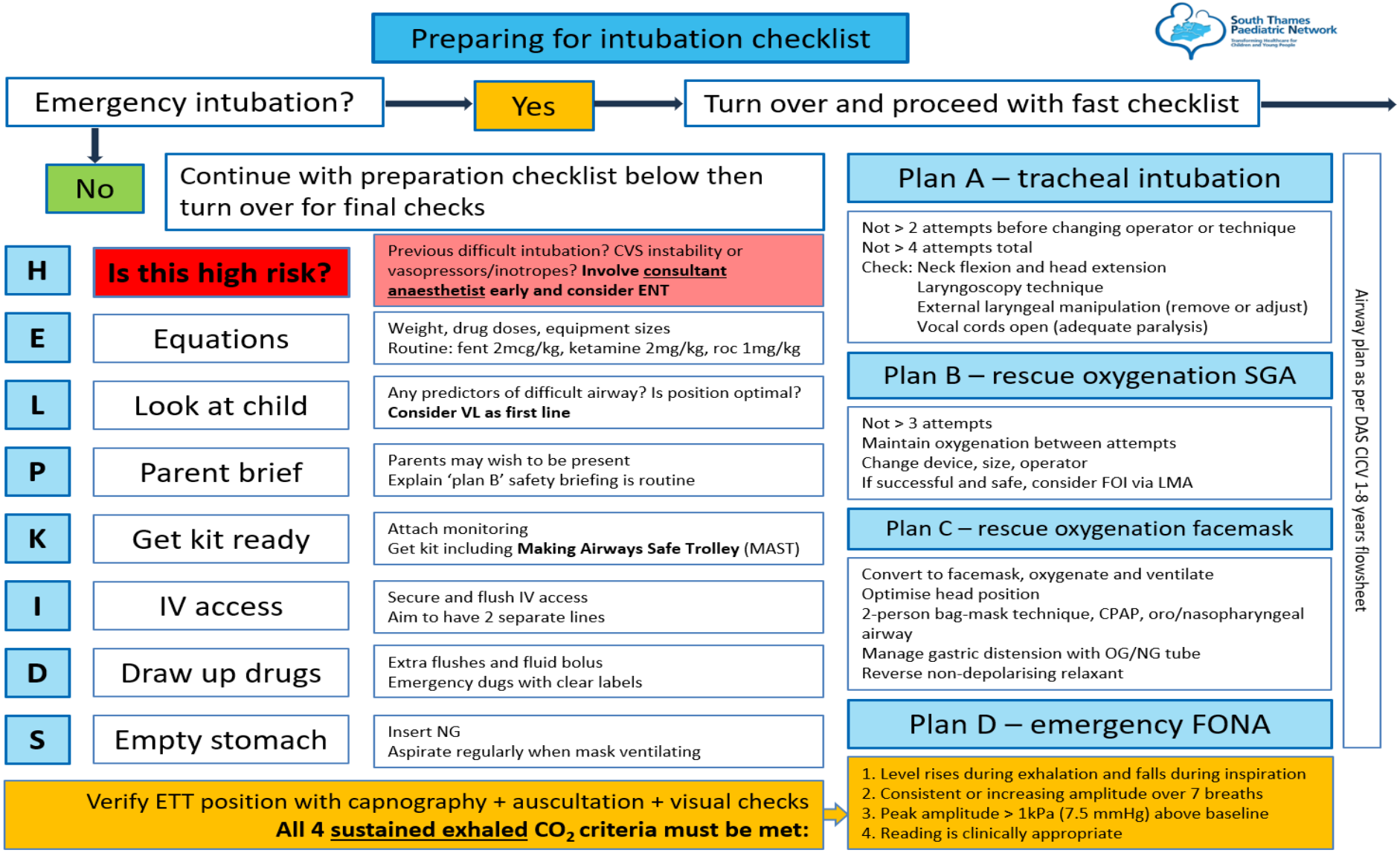


Paediatric Emergency Front of Neck Access (PLAN D)



Appendix B – Checklist and Kit Dump

HELPKIDS acronym and information was adapted from the Evelina's 'Paediatric Critical Care: Intubation Guideline'.



Emergency intubation fast check

Prepare patient

- ❑ Commence pre-oxygenation
- ❑ Optimise position (shoulder roll, head ring, pillow?)
- ❑ Check the cannula is working
- ❑ Attach monitoring
- ❑ Aspirate the stomach
- ❑ Optimise physiology (fluids, vasopressors / inotropes)

Equipment sizes

Uncuffed ETT

- ❑ Term neonate: 3.5 mm ID
- ❑ 5 months 4.0 mm ID
- ❑ >1 year (Age/4) +4

Length Oral ETT

- ❑ > 1 year (Age/2) + 12

eFONA equipment sizes

Age 0 – 2 years

- ❑ Size 10 Scalpel + 8 Fr Bougie + Cuffed 3 & 4mm ID ETT

Age 2 – 8 years

- ❑ Size 10 Scalpel + 10 Fr Bougie + Cuffed 4 & 5 mm ID ETT

Age 8 – Adult

- ❑ Size 10 Scalpel + 14 Fr Bougie + Cuffed 5 & 6 mm ID ETT

Prepare equipment

Check monitoring

- ❑ Audible SpO2 'beeps'
- ❑ BP cuff on 2-minute cycling
- ❑ ETCO2 waveform showing

Equipment to ventilate

- ❑ Anaesthetic circuit with ETCO2, filter and catheter mount
- ❑ Yankauer suction under pillow
- ❑ Face mask
- ❑ OPA/guedel airway

Equipment to intubate

- ❑ Two direct laryngoscopes
- ❑ Bulbs working?
- ❑ ET tube with cuff tested
- ❑ Size below / uncuffed
- ❑ Bougie / stylet
- ❑ Supraglottic airways with syringe to inflate
- ❑ Guedel / nasal airways
- ❑ **Use video laryngoscope as first line if suspecting difficulty**

Check the drugs

- ❑ Consider using ketamine
- ❑ Relaxant
- ❑ Fluid bolus/extra flushes
- ❑ Vasopressors needed?
- ❑ Maintenance sedation

Prepare team

Allocate roles

- ❑ Who is intubating?
- ❑ Who is assisting?
- ❑ Who is giving drugs?
- ❑ Identify other team members present

Plan for difficulties

- ❑ Confirm the primary intubation plan (see overleaf)
- ❑ Confirm the drug doses
- ❑ What is Plan B? C?
- ❑ Is the appropriate size eFONA equipment available?
- ❑ HELP – Who? How to reach them?

Verify ETT position with capnography + auscultation + visual checks

Check for sustained exhaled CO_2

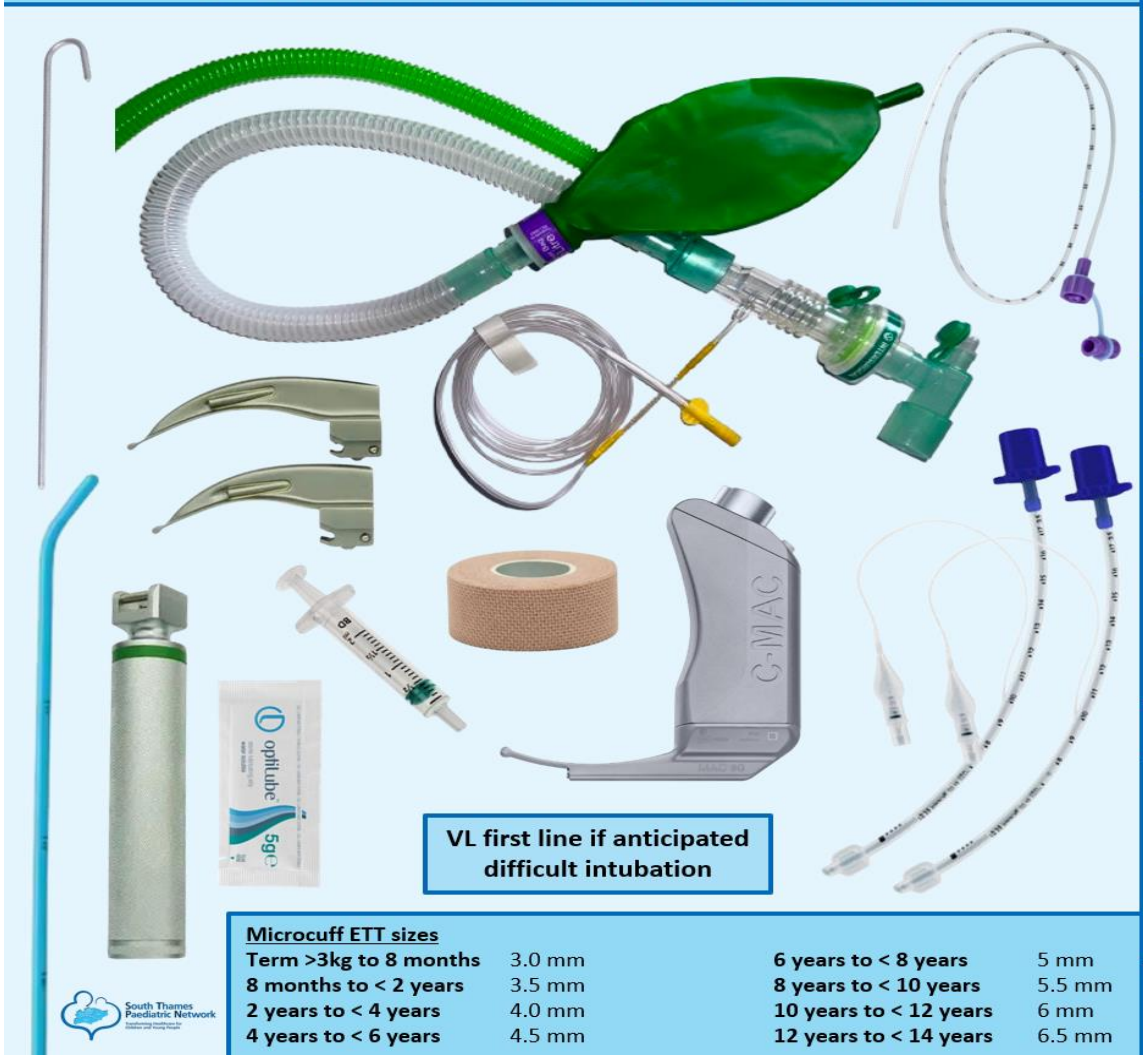
After intubation

- ❑ Tape tube in position
- ❑ Initiate sedation
- ❑ Establish mechanical ventilation
- ❑ Chest x-ray
- ❑ Re stock emergency airway trolley

Please print in A3.

Plan A – tracheal intubation

High risk? **Involve consultant anaesthetist early and consider ENT**



VL first line if anticipated difficult intubation

Microcuff ETT sizes

Term >3kg to 8 months	3.0 mm	**6 years to < 8 years**	5 mm
8 months to < 2 years	3.5 mm	**8 years to < 10 years**	5.5 mm
2 years to < 4 years	4.0 mm	**10 years to < 12 years**	6 mm
4 years to < 6 years	4.5 mm	**12 years to < 14 years**	6.5 mm

Plan B – rescue oxygenation with SGA

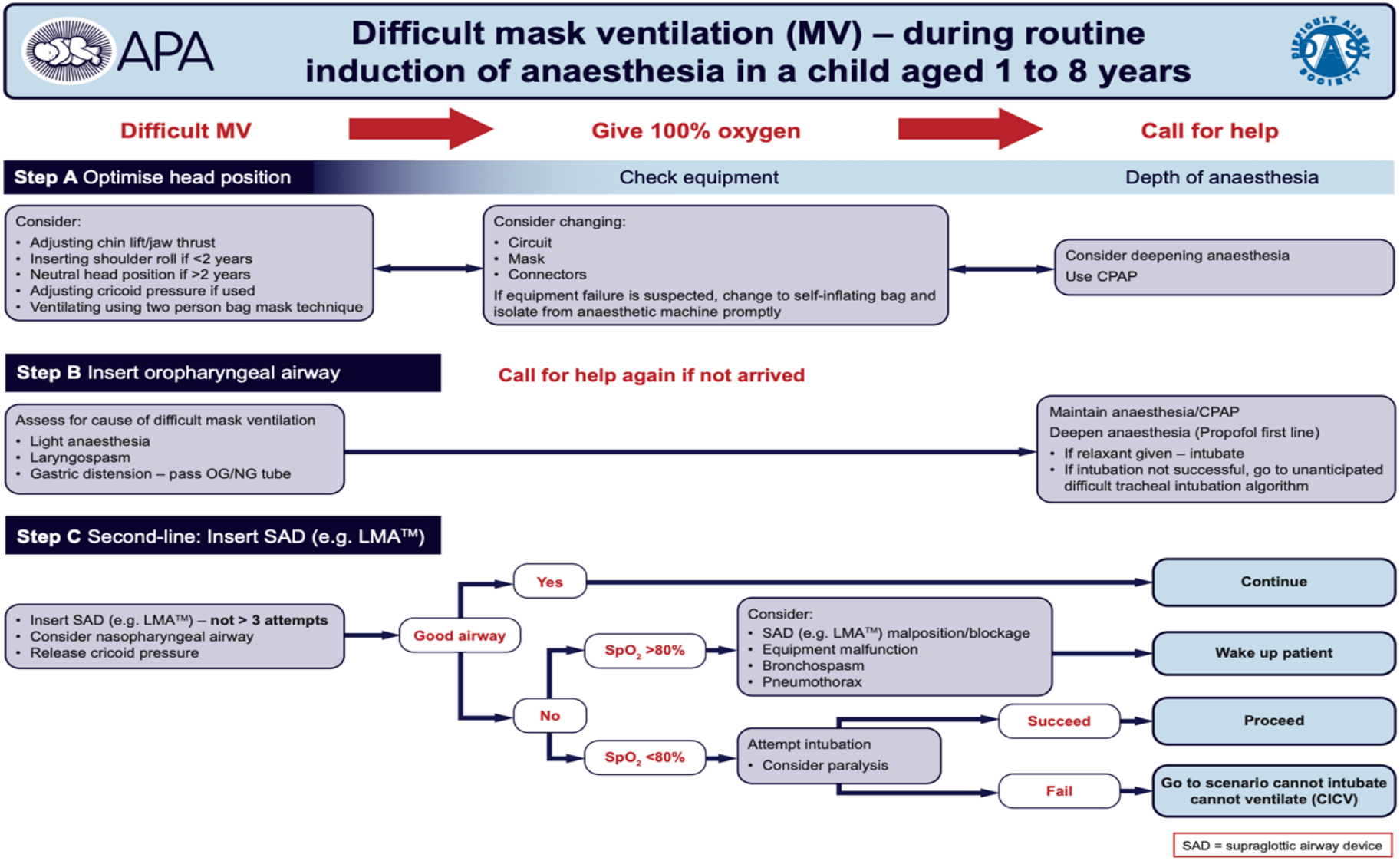
< 5 kg	#1	4ml cuff			
5-10 kg	#1.5	7ml cuff	**20-30kg**	#2.5	14 ml cuff
10-20kg	#2	10ml cuff	**30-50kg**	#3	20 ml cuff

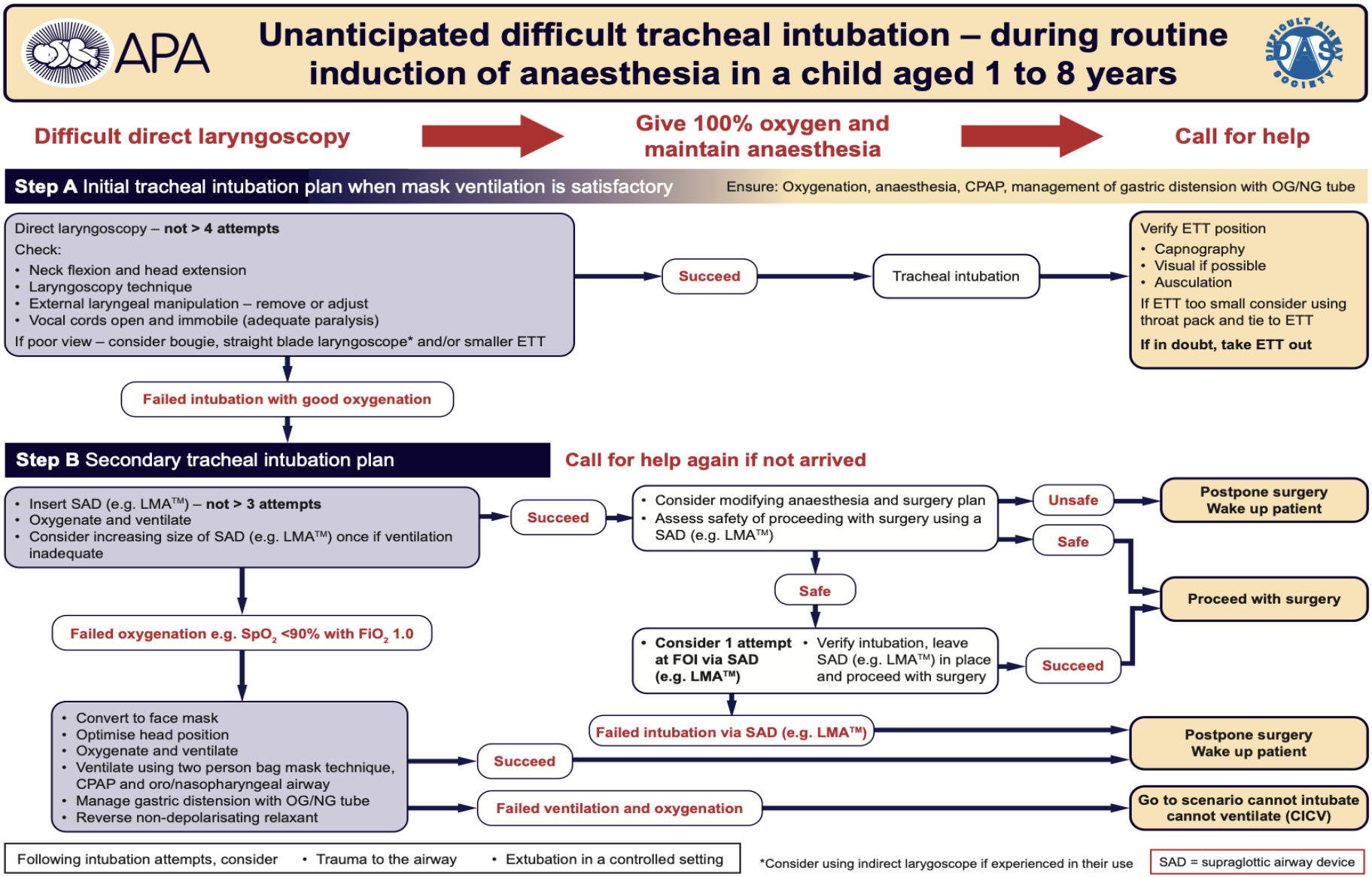
Plan C – rescue oxygenation with facemask

Plan D – emergency FONA

Age 0 – 2 years	Size 10 Scalpel + 8 Fr Bougie + Cuffed 3 & 4mm ID ETT
Age 2 – 8 years	Size 10 Scalpel + 10 Fr Bougie + Cuffed 4 & 5 mm ID ETT
Age 8 – Adult	Size 10 Scalpel + 14 Fr Bougie + Cuffed 5 & 6 mm ID ETT

Appendix C – DAS Algorithms




APA
Unanticipated difficult tracheal intubation – during routine induction of anaesthesia in a child aged 1 to 8 years
DAS
Difficult direct laryngoscopy
Give 100% oxygen and maintain anaesthesia
Call for help
Step A Initial tracheal intubation plan when mask ventilation is satisfactory
Ensure: Oxygenation, anaesthesia, CPAP, management of gastric distension with OG/NG tube
Direct laryngoscopy – not > 4 attempts
Check:
• Neck flexion and head extension
• Laryngoscopy technique
• External laryngeal manipulation – remove or adjust
• Vocal cords open and immobile (adequate paralysis)
If poor view – consider bougie, straight blade laryngoscope* and/or smaller ETT
Succeed
Tracheal intubation
Verify ETT position
• Capnography
• Visual if possible
• Ausculation
If ETT too small consider using throat pack and tie to ETT
If in doubt, take ETT out
Failed intubation with good oxygenation
Step B Secondary tracheal intubation plan
Call for help again if not arrived
• Insert SAD (e.g. LMA™) – not > 3 attempts
• Oxygenate and ventilate
• Consider increasing size of SAD (e.g. LMA™) once if ventilation inadequate
Succeed
• Consider modifying anaesthesia and surgery plan
• Assess safety of proceeding with surgery using a SAD (e.g. LMA™)
Unsafe
Postpone surgery Wake up patient
Safe
Safe
Proceed with surgery
Failed oxygenation e.g. SpO2 <90% with FiO2 1.0
• Consider 1 attempt at FOI via SAD (e.g. LMA™)
• Verify intubation, leave SAD (e.g. LMA™) in place and proceed with surgery
Succeed
• Convert to face mask
• Optimise head position
• Oxygenate and ventilate
• Ventilate using two person bag mask technique, CPAP and oro/nasopharyngeal airway
• Manage gastric distension with OG/NG tube
• Reverse non-depolarisating relaxant
Failed intubation via SAD (e.g. LMA™)
Postpone surgery Wake up patient
Succeed
Failed ventilation and oxygenation
Go to scenario cannot intubate cannot ventilate (CICV)
Following intubation attempts, consider • Trauma to the airway • Extubation in a controlled setting
*Consider using indirect larygoscope if experienced in their use
SAD = supraglottic airway device

Cannot intubate and cannot ventilate (CICV) in a paralysed anaesthetised child aged 1 to 8 years

APA

DAS Difficult Airway Society

Failed intubation inadequate ventilation → **Give 100% oxygen** → **Call for help**

Step A Continue to attempt oxygenation and ventilation

- FiO_2 1.0
- Optimise head position and chin lift/jaw thrust
- Insert oropharyngeal airway or SAD (e.g. LMA™)
- Ventilate using two person bag mask technique
- Manage gastric distension with an OG/NG tube

Step B Attempt wake up if maintaining SpO_2 >80%

If rocuronium or vecuronium used, consider suggamadex (16mg/kg) for full reversal

Prepare for rescue techniques in case child deteriorates

Step C Airway rescue techniques for CICV (SpO_2 <80% and falling) and/or heart rate decreasing

Call for help again if not arrived

Call for specialist ENT assistance

- **ENT available** → Consider:
  - Surgical tracheostomy
  - Rigid bronchoscopy + ventilate / jet ventilation (pressure limited)
- **ENT not available** → Percutaneous cannula cricothyroidotomy / transtracheal jet ventilation (pressure limited)
  - **Succeed** → Continue jet ventilation set to lowest delivery pressure until wake up or definitive airway established
  - **Fail** →
    - Perform surgical cricothyroidotomy / transtracheal and insertion of ETT / tracheostomy tube*
    - Consider passive O_2 insufflation while preparing

*Note: Cricothyroidotomy techniques can have serious complications and training is required – only use in life-threatening situations and convert to a definitive airway as soon as possible

Cannula cricothyroidotomy

- Extend the neck (shoulder roll)
- Stabilise larynx with non-dominant hand
- Access the cricothyroidotomy membrane with a dedicated 14/16 gauge cannula
- Aim in a caudad direction
- Confirm position by air aspiration using a syringe with saline
- Connect to either:
  - adjustable pressure limiting device, set to lowest delivery pressure

  or
  - 4Bar O_2 source with a flowmeter (match flow l/min to child's age) and Y connector
- Cautiously increase inflation pressure/flow rate to achieve adequate chest expansion Wait for full expiration before next inflation
- Maintain uper airway patency to aid expiration

SAD = supraglottic airway device

Appendix D: Airway Equipment Compatibility Guide
University Hospitals Sussex

BRIGHTON ANAESTHESIA

Paediatric Airway Equipment Quick Reference

NHS University Hospitals Sussex NHS Foundation Trust

TABLE 1: AIRWAY DEVICES

Age (years)	Weight (kg)	Guedel	LMA	iGel	Laryngoscope Blade/CMAC	Air-Q (max size uncuffed ETT)
Neonate	1	3.5	1	1	Mac 0 / Miller 0	0 (3)
	2					
	3	5				0.5 (4)
	4					
Infant	5	5.5	1.5	1.5	Mac 1 / Miller 1	1.0 (4.5)
	6					
	7					
	8					
	9					
1 to 6	10	6.5 (for 1-6yr old)	2	2	Mac 1 or 2	1.5 (5)
	11					
	12					
	13				Mac 2	
	14					
	15					
	17					
	20		2.5		Mac 2 or 3	2 (5.5)
6 to 10	25	7		2.5		
	30		3			
10 to 16	35			3	Mac 3	3 (7)
	40	8 (12yrs to adult)				
	45					
	50		4			
	55				Mac 3 or 4	
	60					

TABLE 2: ET TUBES: <1y SIZE ON WEIGHT, >1Y SIZE ON AGE

Age (years)	Weight (kg)	ETT Size (Microcuff)	ETT Size (Uncuffed)	Oral ETT Length (cm)
Neonate	1		2 - 2.5	7
	2		2.5 - 3	8
	3	3*	3 - 3.5	9
	4		3.5	10
Infant	5			11
	6			
	7		3.5-4	11.5
	8	3.5		12
	9			12.5
	10			13
1			4	13.5
2		4	4.5	14
3			4.5-5	14.5
4		4.5	5	15
5			5-5.5	15.5
6		5	5.5	16
7			5.5-6	16.5
8		5.5	6	17
9				17.5
10		6		18
11				18.5
12		6.5		19
13				19.5
14		7		20
15				20.5

ALWAYS HAVE ONE LARGER AND ONE SMALLER AVAILABLE

*** Microcuff ETT should only be used in term neonates >3kg**

Please note: No bars on the LMA to allow passage of a tube through it. Always check that a tube can be passed first.

Dr Andrew Kermode, Dr James Andren, Dr Emma Lillie. 2022

BRIGHTON ANAESTHESIA

Paediatric Airway Equipment Quick Reference

TABLE 3: DIFFICULT AIRWAY/ACCESSORY DEVICES: SIZE BASED ON ETT INTERNAL DIAMETER

ETT Size ID	Stylet	Bougie	Suction Catheter	NGT	Fibreoptic Scope		Video Bronchoscope	Cook Airway Exchange Catheter
3	Small	5 Fr	6 Fr	6 Fr		Olympus 2.2mm	Size 3 (No 162) *SNUG, Remove 15mm Connector*	8 Fr
3.5		10 Fr			Storz 2.8mm		Size 3 (No. 162)	
4			8 Fr	8 Fr				11 Fr
4.5					Storz 4.0mm	Olympus 4.1mm	Size 4 (No. 164)	
5	Medium	15 Fr	10 Fr	10 Fr				14 Fr
5.5								
6			12 Fr	12 Fr				
6.5								
7			14 Fr	14 Fr				
7.5								

TABLE 4: INTUBATING THROUGH 1st GENERATION DISPOSABLE LMA

LMA	Uncuffed ETT	Cuffed ETT
1	3	LMA under size 3 will not allow passage of pilot balloon
1.5	3.5	
2	4	
2.5	5	
3	6	5.5

Dr Andrew Kermode, Dr James Andren, Dr Emma Lillie. 2022

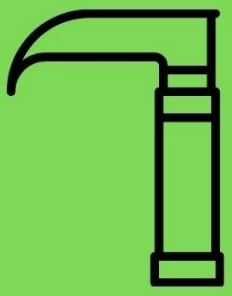
Appendix E – ENT Equipment List and Trolley Design

Please print in A4.

EMERGENCY AIRWAY TROLLEY KIT LIST

Plan A: Tracheal intubation

1. Video Laryngoscope
2. Ayres T-Piece (Mapleson F Circuit) Paediatric/Adult
3. Laryngoscopes: Mac 0,1,.2, 3 and Miller 0,1
4. ET Tubes - 2.5, 3.0, 3.5, 4.0, 4.5, 5.0. 5.5, 6.0, 6.5, 7.0 (X2 of each)
5. Elastoplast x2 rolls
6. Scissors
7. Magill's forceps - Paediatric and Adult
8. Bougie - 5, 10, 15FR
9. 5ml and 10 mls syringes
10. Stylets - small and medium
11. NG Tubes 6, 8,10,12, 14
12. Purple 20 and 50 mls Syringes
13. Suction Catheters Size 6, 8, 10,12, 14
14. Stethoscope and Neonatal/Paediatric CO2 line.



Plan B: Rescue oxygenation

1. Guedal airways size: 000,00,0,1,2,3,4,5,6
2. Igel/LMA Size 1, 1.5, 2, 2,5, 3.0

Plan C: Rescue oxygenation facemask

1. BVM - Neonatal, Paediatric, Adult
2. Masks - Anaesthetic: 0, 1, 2, 3
3. Laerdal Silicone resus masks: Size 00, 0, 1

Plan D: Front of Neck access

Emergency Airway packs:

Pack 1 - Cannula Cricothyroidotomy
- Chlorhexidine wipe
- Cannula Size - Pre-term: 18G / Term baby to 1 year: 16G / Greater than 1 year: 14G
- 5ml leur lock syringe
- 10ml 0.9% sodium chloride
- Oxygen tubing, 3-way tap with extension (attach to O2 1l/min/kg up to 15L/min)
- Rapid Insufflator (attach to O2 1l/min/kg up to 15L/min)
- ManuJet (available outside of pack)

Pack 2 - Scalpel – Bougie – Tube Age 0 - 2 Years
- Chlorhexidine wipe
- Scalpel: 10 Blade
- Bougie: 8 Fr
- Cooks Exchange Catheter: 8Fr
- Frova Intubating Introducer: 8Fr
- Cuffed Oral Endotracheal Tube: 3.0mm /4.0mm
- Syringe for ETT Cuff: 10ml and lubricating jelly
- Oxygen Delivery Device: Ayre's T Piece / Paediatric Anaesthetic Circuit

Pack 3 - Scalpel – Bougie – Tube Age 2 – 8 Years
- Chlorhexidine wipe
- Scalpel: 10 Blade
- Bougie: 10Fr
- Cooks Exchange Catheter: 11Fr
- Frova Intubating Introducer: 8Fr
- Cuffed Oral Endotracheal Tube: 4.0mm / 5.0mm
- Syringe for ETT Cuff: 10ml and lubricating jelly
- Oxygen Delivery Device: Ayre's T Piece / Paediatric Anaesthetic circuit

Pack 4 – Scalpel – Bougie – Tube Age > 8years – Adult
- Chlorhexidine wipe
- Scalpel: 10 Blade
- Bougie: 14Fr
- Cooks Exchange Catheter: 14Fr
- Frova Intubating Introducer: 14Fr (only for 6.0mm and above ETT)
- Cuffed Oral Endotracheal Tube: 5.0mm / 6.0mm
- Syringe for ETT Cuff: 10ml and lubricating jelly
- Oxygen Delivery Device: Water's Circuit / Adult Anaesthetic circuit

Please print in A4.

ENT EMERGENCY AIRWAY TROLLEY KIT LIST

Draw 1: Airway Visualisation:

1. Hopkins telescope: 2.7 mm diameter, 18 cm length, with compatible light clip and light cable
2. Benjamin Lindholm laryngoscope: infant and child sizes

Draw 2: Ventilating Bronchoscopy Equipment:

1. Bronchoscopes: Sizes 2.5, 3, .5, 4, 4.5, 5, and 6
2. Compatible bronchoscopic bridges
3. Flexible suction catheter suitable for insertion through bronchoscope
4. Injection cannula
5. Prismatic light detector

Draw 3: Foreign Body Removal Kit:

1. Hopkins telescope: 2.9 mm, 36 cm, 0-degree
2. Optical forceps: including alligator, peanut grasping,
3. 2x2 toothed (suitable for coin retrieval) and standard alligator forceps

Draw 4: Paediatric Tracheostomy Equipment:

1. 10 scalpel blade
2. Bipolar diathermy forceps
3. Surgical scissors (e.g., baby Metzenbaum or tenotomy scissors)
4. Retractors (e.g., skin hooks, cats paws, Langenbeck retractors)
5. Tracheostomy dilatation forceps
6. A full range of tracheostomy tubes, including paediatric and neonatal lengths, sizes 2.5 to 5.5
7. Tracheostomy ties and foam dressings

Appendix F – Out of hours ENT provision

ICS	Trust	Site	In Hours ENT Provision	Out of Hours ENT Provision	Contact for Out of Hours ENT support in the case of a Difficult Airway	Specialist ENT Provision
SE London	Lewisham & Greenwich Trust	**Queen Elizabeth Hospital**	Lewisham & Greenwich Trust ENT Team	Lewisham & Greenwich Trust ENT Team	**ENT On call SHO bleep is 2270 (based in Lewisham)** **On call ENT registrar or consultant, please ask via switchboard** **020 8333 3000**	Evelina London Children's Hospital
		Lewisham Hospital	Lewisham & Greenwich Trust ENT Team			
	Evelina London Children Hospital	**Evelina London Children's Hospital**	Evelina London Children's Hospital ENT Team	St Thomas' Hospital on call ENT Team	**Switchboard** **020 7188 7188** **Ask for ENT on call and they will make contact with the appropriate person via their mobile** **Paediatric ENT airway mobile, daytime hours 8am-6pm** **07867 140175**	Evelina London Children's Hospital
	Kings College Hospitals	**Kings- Denmark Hill**	Evelina London Children's Hospital ENT Team	St Thomas' Hospital on call ENT Team	**As above** **Switchboard 020 7188 7188** **Ask for ENT on call** *KCH Max fax team can support surgically in extremis*	Evelina London Children's Hospital
		PRUH	PRUH ENT Team	PRUH ENT Team	**On call ENT Team via hospital switchboard 01689 863000**	Evelina London Children's Hospital

Contact details are correct as of August 2025; local confirmation is advised.

ICS	Trust	Site	In Hours ENT Provision	Out of Hours ENT Provision	Contact for Out of Hours ENT support in the case of a Difficult Airway	Specialist ENT Provision
SW London	St. George's Hospital Trust	St. George's Hospital	St George's ENT Team	St George's ENT Team	5pm till 8am 02086721255 Dial 2 to bleep Bleep 6163	St George's ENT Team
	Croydon Health Services Trust	Croydon University Hospital	Croydon ENT Team	St George's ENT Team		St George's Hospital
	Epsom and St Helier Trust	Epsom Hospital	Epsom & St. Helier ENT Team (likely on St. Helier site)	St George's ENT Team		St George's Hospital
		St. Helier Hospital	Epsom & St. Helier ENT Team			
	Kingston Hospital Trust	Kingston Hospital	Kingston Hospital ENT Team	St George's ENT Team		St George's Hospital
	Royal Marsden Trust	Royal Marsden-Sutton	St George's ENT Team	St George's ENT Team		St George's Hospital

Contact details are correct as of August 2025; local confirmation is advised.

ICS	Trust	Site	In Hours ENT Provision	Out of Hours ENT Provision	Contact for Out of Hours ENT support in the case of a <u>Difficult Airway</u>	Specialist ENT Provision
Surrey	**Ashford and St Peter's Hospitals Trust**	**Ashford Hospital**	*Only OPD. No Surgery or ED.* ASPH ENT Team	ASPH ENT Team	**Reg/Consultant via switchboard: 01932 872000** **If this fails then call Ashford site Extn 4636 (only 9am - 5pm weekdays)** **There are no SHOs at ASPH**	St George's Hospital
		St. Peter's Hospital	ASPH ENT Team (occasionally at Ashford site)			
	Royal Surrey County Hospital Trust	**Royal Surrey County Hospital**	Royal Surrey ENT Team	Royal Surrey ENT Team	**Reg/Consultant via switchboard: 01483 571122** **ENT SHO Bleep 0500** **ENT Ward SHO (only till 8am- 5pm weekdays): 4115**	St George's Hospital
	Surrey and Sussex Healthcare Trust	**Crawley Hospital**	*Only OPD. No Surgery or ED.* SASH ENT Team	SASH ENT Team	**East Surrey** **01737 768511** **Dial 0 for Emergency Operator** **Bleep 246**	Evelina London Children Hospital
		East Surrey Hospital	SASH ENT Team			Evelina London Children Hospital

Contact details are correct as of August 2025; local confirmation is advised.

ICS	Trust	Site	In Hours ENT Provision	Out of Hours ENT Provision	Contact for Out of Hours ENT support in the case of a Difficult Airway	Specialist ENT Provision
Sussex	**University Hospitals Sussex**	**Royal Alexandra Children's Hospital**	Royal Alex ENT Team	University Hospitals Sussex ENT Team	**Request the on call ENT Consultant or Registrar via Royal Alexandra switchboard 01273 696955**	University Hospitals Sussex Evelina London Children Hospital- for tertiary support/ level 3 critical care
		Princess Royal Hospital				
	Queen Victoria Hospital Trust	**Queen Victoria Hospital**	QVH Maxillofacial Team *(for any surgical input required in managing a difficult airway)* and/ or University Hospitals Sussex ENT Team	QVH Maxillofacial Team and/ or University Hospitals Sussex ENT Team	*Limited OOH services (Day Surgery Unit)* **Contact Maxillofacial Consultant via switchboard 01342 414000**	University Hospitals Sussex
	East Sussex Healthcare NHS Trust	**Eastbourne Hospital**	East Sussex ENT Team	East Sussex ENT Team	**Request the on call ENT Consultant or Registrar** (as appropriate) **via switchboard 0300 131 4500**	Evelina London Children Hospital
		Conquest Hospital	East Sussex ENT Team			Evelina London Children Hospital

Contact details are correct as of August 2025; local confirmation is advised.

ICS	Trust	Site	In Hours ENT Provision	Out of Hours ENT Provision	Contact for Out of Hours ENT support in the case of a Difficult Airway	Specialist ENT Provision
Kent	**Dartford & Gravesham Trust**	**Dartford Hospital**	Medway ENT Team	Medway ENT Team	**Call Medway switchboard 01634 830000 Ask for the ENT Registrar on call**	Evelina London Children Hospital
	East Kent Hospitals Trust	**Kent and Canterbury Hospital**	East Kent ENT Team	East Kent ENT Team *(Only on site at WHH)*	**Call switchboard 01227 766877 Ask for the ENT Registrar on call**	Evelina London Children Hospital
		William Harvey Hospital				
		Queen Mother Queen Margaret				
	Medway Trust	**Medway Hospital**	Medway ENT Team	Medway ENT Team	**Call switchboard 01634 830000 Ask for the ENT Registrar on call**	Evelina London Children Hospital
	Maidstone and Tunbridge Wells	**Maidstone Hospital**	MTW ENT Team	MTW ENT Team	**Call switchboard 01892823535 Ask for the ENT Registrar on call**	Evelina London Children Hospital

Contact details are correct as of August 2025; local confirmation is advised.

Appendix G – STPN Emergency Front of Neck Access (eFONA)

STPN Emergency Front of Neck Access (eFONA)

1. Background

Difficult airways in children are rare.

Usually, these can be anticipated, as they are due to obvious congenital airway abnormalities or acute airway pathology. When difficulty is expected, expert advice and assistance should be sought before any airway intervention or management.

Difficult ventilation in children without airway abnormality is most often secondary to laryngospasm or upper airway obstruction. These are reversible with appropriate management.

Can't Intubate, Can't Oxygenate (CICO) situations are life-threatening emergencies due to irreversible airway obstruction. They require Front of Neck Access (FONA) to the trachea. Emergency FONA (eFONA) is a potentially life-saving procedure. Even with training, eFONA is difficult to perform, especially in the paediatric population. Equipment required to perform eFONA must be readily available at all locations where intubation and airway management occur.

2. Emergency Front of Neck Access

In practice, there are three available techniques to provide oxygenation and/or ventilation via the front of neck in a CICO situation. These are:

- **Cannula Cricothyroidotomy**
- **Surgical Cricothyroidotomy**
- **Tracheostomy**

The choice of emergency front of neck access will depend on the situation and the expertise available.

If an ENT surgeon is not immediately available, responsibility for the front of neck access falls to the Anaesthetist or the most appropriate senior clinician. Adult literature suggests surgical cricothyroidotomy has the highest success rate, however, evidence in infant, babies and younger children is very limited and a cannula technique may be appropriate. We suggest training in both techniques so that all options may be considered based on the clinical scenario.

If an ENT surgeon is present, tracheostomy is likely to be the option with the highest chance of success.

ENT surgeons may also consider rigid bronchoscopy and intubation or ventilating via a rigid bronchoscope.

2.1 Cannula Cricothyroidotomy

- This technique involves placing a cannula into the trachea and delivering oxygen via one of three methods:
  - Standard oxygen tubing and a 3-way tap
  - Rapid Insufflator Device
  - Jet Ventilator - ManuJet
- Cannula cricothyroidotomy is a temporising solution to provide oxygenation until a more definitive airway can be secured.

- It is associated with a high degree of failure due to cannula misplacement or kinking.
- Jet ventilation carries a risk of barotrauma.

2.2 Surgical Cricothyroidotomy "Scalpel, Bougie, Tube"

- This technique involves accessing the trachea through the cricothyroid membrane, introducing a bougie (or exchange catheter) into the trachea, and railroading an endotracheal tube into the trachea to secure the airway.
- It provides a more definitive airway than a cannula cricothyroidotomy and, when successful, allows for positive pressure ventilation.
- The cricothyroid membrane can be extremely difficult to identify in small children and babies, and the trachea is small, increasing the risk of tracheal injury.

2.3 Tracheostomy

- This technique involves making an incision in the neck, exposing the trachea, and placing an appropriately sized tracheostomy tube into it.
- This technique requires more equipment and set-up than cannula or surgical cricothyroidotomy and may take longer.
- It will, however, be more likely to result in a definitive airway and allow for positive pressure ventilation.

2.4 Choice of Technique and Age

- There is insufficient evidence or expert consensus to provide clear guidance on which technique to choose at which age.
- **In the event of CICO with ENT present, a surgical tracheostomy at any age is likely the most appropriate option.**
- When ENT are not present, the Anaesthetist should choose the option they feel has the best chance of success in their hands and in the situation, they are in.
- Surgical cricothyroidotomy may become less challenging as children get older. The Difficult Airway Society suggests that in children above 8 years; proceed with a surgical cricothyroidotomy and below 8 to use a cannula technique. In this guidance, we will provide suitable equipment sizes for both techniques across all age groups, as the realities of these situations are extremely complex and it is difficult to be completely prescriptive.

2.5 eFONA Packs (Appendix H)

- Pre-prepared packs of equipment for emergency front of neck access are extremely useful for ensuring appropriately sized equipment is available immediately.
- Each Trust should consider the best way to store this equipment and ensure its rapid availability in the event of an emergency.
- When using pre-prepared packs, it may be prudent to have the pack size above and below ready for use, especially for children on the cusp of the age ranges described.

3. Techniques and Equipment

3.1. Cannula Cricothyroidotomy

1. Equipment

- Cannula
  - Pre-term: 18G
  - Term baby to 1 year: 16G
  - Greater than 1 year: 14G

- 5ml luer lock syringe
- 10ml 0.9% Sodium Chloride
- Chlorhexidine wipe
- Means to oxygenate
    - Oxygen tubing, 3-way tap with extension (attach to O2 1l/min/kg up to 15L/min)
    - Rapid Insufflator (attach to O2 1l/min/kg up to 15L/min)
    - ManuJet – stages of set-up:

ManuJet box with instructions

ManuJet set-up

Pull the knob and rotate to adjust desired pressure

Green colour range for Baby

Yellow colour range for Infant

Red colour range for Adults

Squeeze trigger to deliver Jet

2. Procedure

- Ensure muscle relaxation is given
- Ensure ENT are on their way
- Continue oxygenation attempts whilst equipment is prepared
- Stand on the patient's left (for right-handed operator)
- Fully extend the neck (use shoulder roll if required)
- Stabilise trachea with non-dominant hand
- Identify cricothyroid membrane (may be difficult under eight; if so, identify tracheal rings and the space between)
- Insert cannula at 45° angle caudal through cricothyroid membrane
- Confirm position through aspiration of air
- Attach to source of ventilation via Luer Lock
- Oxygenate via chosen source

3. Post Procedure

- Cautiously increase pressure or flow rate to achieve adequate chest expansion or oxygenation.
- Maintain upper airway patency to allow for full expiration.
- Wait for expiration before next inspiration.
- Expect this technique to fail even if initial success at oxygenation.
- Plan for next steps, i.e. tracheostomy when ENT arrive, surgical cricothyroidotomy in the event of further failed oxygenation.

Cannula Cricothyroidotomy

This set-up is for an approximate 6–7-year-old. Smaller equipment will be required in younger children – refer to the guideline for further information. **Cannula Cricothyroidotomy has a high failure rate and if successful should be seen as a temporising method before a definitive airway can be achieved.**

- Assemble equipment
- Cannula:
- Pre-term: 18G
- Term baby to 1 year: 16G
- Greater than 1 year: 14G
- 5ml Syringe with 3ml Saline
- Oxygen Tubing, 3 Way Tap – connected to 1l/min/kg
  OR – ManuJet / Rapid Insufflater
- **Continue oxygenation attempts whilst preparing.**
- **Ensure ENT team have been called.**

- Extend neck.
- Identify Cricothyroid Membrane.
- Stabilise trachea
- Approach at 45 degrees.

- Aspirate as you insert.
- Confirm position through aspiration of air.

- Slide off cannula into trachea.
- Stabilise the cannula.

- Assistant to attach 3 way tap and oxygen tubing / ManuJet / Rapid Insufflation Device.
- Keep cannula stabilised.

- Occlude 3-way tap (increase / pressure flow) to achieve chest expansion.
- Allow for passive expiration.
- Carefully examine neck for signs of incorrect placement (swelling, surgical emphysema).
- Carefully secure the cannula.
- If oxygenation achieved continue, paying careful attention to risk of cannula kinking or dislodgement.
- Plan for more definitive airway.
- **If incorrect placement or failure to oxygenate continue to Surgical Cricothyroidotomy or Surgical Tracheostomy.**

3.2. Surgical Cricothyroidotomy – Scalpel, Bougie, Tube

1. Equipment

There are multiple introducers available that may be used for the “bougie” or introducer part of the procedure. The advantages of the Cook Exchange Catheter and Frova Intubating Introducer are that they come with 15mm adaptors for oxygen delivery through the introducer. Standard bougies have the advantage of familiarity and availability in most settings. It is important to ensure the choice of introducer is compatible with the endotracheal tube size recommended for the patient.

Age Range	**0-2 year**	**2-8 years**	**Above 8 Years**
Scalpel	10 Blade	10 Blade	10 Blade
Bougie	8Fr	10Fr	14Fr
Cooks Exchange Catheter	8Fr	11Fr	14Fr
Frova Intubating Introducer	8Fr	8Fr	14Fr (Only for 6.0mm and above ETT)
Cuffed Oral Endotracheal Tube	3.0mm 4.0mm	4.0mm 5.0mm	5.0mm 6.0mm
Syringe for ETT Cuff	10ml	10ml	10ml
	Lubricating Jelly	Lubricating Jelly	Lubricating Jelly
Oxygen Delivery Device	Ayre’s T Piece / Paediatric Anaesthetic Circuit	Ayre’s T Piece / Paediatric Anaesthetic Circuit	Water’s Circuit / Adult Anaesthetic Circuit

2. Procedure

- Ensure muscle relaxation is given
- Ensure ENT are on their way
- Continue oxygenation attempts whilst equipment is prepared
- Stand on the patient’s left (for right-handed operator)
- Full neck extension (consider shoulder roll)
- Identify cricothyroid membrane
- Stabilise cricoid with laryngeal handshake
- Make a transverse stab incision through the cricothyroid membrane
- Turn blade 90°
- Slide tip of bougie / introducer along blade into trachea
- Railroad lubricated cuffed endotracheal tube into trachea
- Ventilate, inflate cuff, confirm position with capnography
- Secure tube

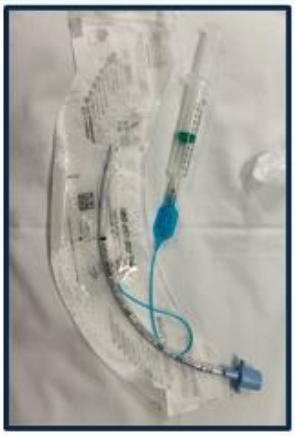
3. Post Procedure

- Positively pressure ventilate on 100% oxygenate and perform full clinical assessment.
- Perform chest x-ray if clinical stability allows.
- Discuss plan with ENT for definitive airway management, i.e. tracheostomy.

Surgical Cricothyroidotomy

"Scalpel, Bougie, Tube"

This set-up is for an approximate 6–7-year-old. Smaller equipment will be required in younger children – refer to the guideline for further information.



- Assemble equipment.
- 10Ch Bougie (11 Fr Cook Exchange Catheter), 10 Scalpel, Size 5.0 COETT, 10ml Syringe, Ayre's T-Piece.
- Have smaller ETT sizes available.
- Check cuff and lubricate bougie.
- **Continue oxygenation attempts whilst preparing.**
- **Ensure ENT team have been called.**
- Either a bougie or an exchange catheter may be used depending on local availability. Exchange catheters can also be used as bougies.

- Extend neck.
- Identify cricothyroid membrane.
- Stabilise cricoid.

- Transverse stab incision through the cricothyroid-membrane.

- Twist the scalpel through 90 degrees.

- Slide the tip of the bougie along the blade into the trachea (exchange catheter).

- Keep bougie stable.
- Load ETT and carefully advance.

- Keeping hold of the bougie advance ETT into trachea.

- Inflate cuff.
- Ventilate and conform position with capnography.

3.3. Surgical Tracheostomy

1. Equipment

- Suction and oxygen setup
- Scalpel (No.15), tracheal hook, artery forceps, tracheal dilator
- Tracheostomy ties, 3/0 silk stay sutures
- These refer specifically to Tracheostomy tubes:
    - Correct size and length (neonatal vs paediatric)
    - Have one size smaller as a backup
    - Generally, uncuffed in infants/children (to reduce mucosal injury)
    - Approximate uncuffed tube sizes:

2. Preparation

Indication:
"Cannot intubate, cannot ventilate" or upper airway obstruction when other manoeuvres fail. *Cricothyroidotomy is challenging in small children; emergency tracheostomy is the preferred surgical airway.*

Position:
Supine with shoulder roll (neck extended - tape can be used to pull the chin and neck in a more extended position and taped to either side of the bed).

3. Landmarks & Incision

- Palpate cricoid cartilage and suprasternal notch
- Target: 2^{nd} - 4^{th} tracheal rings
- Midline incision from between cricoid / suprasternal notch (~2–3 cm)
- A vertical midline incision can allow rapid, safe midline access; a horizontal incision is usually reserved for elective cases where time and cosmetic considerations permit.
- In practice we would recommend the surgeon uses an incision direction that is familiar to them.

4. Dissection & Exposure

- Control bleeding quickly with bipolar diathermy
- Excise or retract subcutaneous fat pad in the midline to expose strap muscles (in an emergency, retraction may suffice, once the tube is inserted and the airway secured, it is important to remove sufficient fat pad to reduce the dead space for tube changes in the future)
- Separate sternohyoid / sternothyroid muscles in midline and retract laterally
- Identify and, if needed, divide/retract the thyroid isthmus
- Clear pre-tracheal fascia to expose tracheal rings.

5. Tracheal Entry

- Identify 2^{nd} - 3^{rd} tracheal rings
- Make a vertical incision in trachea (avoid excising a window)
- Expect air release / bubbling (confirmation)
- Place stay sutures on either side of incision and label "Right" / "Left" (in a time critical emergency, tube insertion may be required first- as below)

6. Tube Insertion

- Withdraw ETT slightly if in SITU
- Gently insert the appropriate tracheostomy tube into the tracheal incision
- If difficult: widen with dilator or artery forceps
- If no trach tube available: insert small ETT temporarily
- Confirm position:
    - Continuous capnography monitoring (CO_2 trace)

  - Bilateral air entry on auscultation
  - Chest rise / SpO_2 improvement
- Secure with cotton tracheostomy ties
- Tape stays sutures to chest and label

7. Immediate Post-Procedural Care

- Transfer to PICU for monitoring and respiratory support or transfer via retrieval service to tertiary centre). Ensure the child is in a safe place, appropriately sedated if required, and kept warm, following the completion of the pre-transport checklist **(Appendix I)**
- A post-operative chest x-ray should be obtained, especially in the context of difficulty and the need for an emergency tracheostomy
- Document: tube size, length, cuff status, and depth at skin
- Complete and display Bed-Head Tracheostomy card (per NCEPOD/NTSP): *Tube make, size, cuff status, depth*
- Airway plan / emergency algorithm
- Key contact numbers (e.g. ENT /anaesthetic teams)
- Keep tracheostomy emergency box at bedside
- First tube change after 7+ days by experienced airway team.

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Appendix H - STPN eFONA Packs

Print on A4 paper; each item should be cut out as an individual label.

PACK 1: Cannula Cricothyroidotomy
Cannula: - **Pre-term: 18G** - **Term baby to 1 year: 16G** - **Greater than 1 year: 14G**
5ml luer lock syringe
10ml 0.9% Sodium Chloride
Chlorhexidine wipe
Oxygen tubing, 3-way tap with extension (attach to O2 1l/min/kg up to 15L/min)
Rapid insufflator (attach to O2 1l/min/kg up to 15L/min)
ManuJet* (available outside of pack)

PACK 2: Age Range: 0-2 years
Scalpel: 10 Blade
Bougie: 8 Fr
Cooks exchange catheter: 8Fr
Frova intubating introducer: 8Fr
Cuffed oral endotracheal tube: 3.0mm /4.0mm
Syringe for ETT cuff: 10ml and lubricating jelly
Oxygen delivery device: Ayre's T Piece / Paediatric Anaesthetic Circuit

PACK 3: Age Range: 2-8 years
Scalpel: 10 Blade
Bougie: 10Fr
Cooks exchange catheter: 11Fr
Frova intubating introducer: 8Fr
Cuffed oral endotracheal tube: 4.0mm / 5.0mm
Syringe for ETT cuff: 10ml and lubricating jelly
Oxygen delivery device: Ayre's T Piece / Paediatric Anaesthetic circuit

PACK 4: Age Range: Above 8 years
Scalpel: 10 Blade
Bougie: 14Fr
Cooks exchange catheter: 14Fr
Frova intubating introducer: 14Fr (only for 6.0mm and above ETT)
Cuffed oral endotracheal tube: 5.0mm / 6.0mm
Syringe for ETT cuff: 10ml and lubricating jelly
Oxygen delivery device: Water's circuit / Adult Anaesthetic circuit

Please print pg.44-47, laminate, and include in the packs, with equipment laid out directly on top of the images.

Cannula Cricothyroidotomy

Attach Maxineb oxygen tubing to 3-way tap

Administer oxygen 1L/kg/min up to 15L/min

Pre-term	18G
Term - 1 year	16G
> 1 year	14G

Scalpel-Bougie-Tube 0 – 2 Years

Scalpel-Bougie-Tube 2 – 8 Years

South Thames Paediatric Network

Scalpel-Bougie-Tube > 8 Years

Appendix I – STPN Emergency Airway Pre-Transport Checklist

Emergency Airway Pre-Transport Stabilisation Checklist

A=Airway		
Airway Type		
Grade of Airway:		
Who assessed the Grade of airway:		
Which team Intubated:		
ETT tube Size:		
Position:	Oral ☐ Nasal ☐	Length:
ETT secured	Yes ☐	No ☐
What is the airway secured with:		
Has the ETT tube been cut	Yes ☐	No ☐
Has the ETT position been confirmed on X-ray:		
Adjuvants used:		
C-spine immobilisation:	Yes ☐	No ☐
Secondary survey undertaken:	Yes ☐	No ☐
Basal Skull Fractures:	Yes ☐	No ☐
NG tube inserted and on free drainage	Yes ☐	No ☐
Has dexamethasone been given:	Yes ☐	No ☐
Brief history of airway management:	Team:	Kit used:
Appropriately sized face mask and BVM:	Yes ☐	Size:
Airway Adjuncts	Yes ☐	Size:
Back up airway plan:		

B=Breathing		
Adequate ventilation via Anaesthetic circuit or ventilator:	Yes ☐	No ☐
Type of ventilation:		
Vent Settings	PIP/PS/PC:	PEEP:
	FIO2	SAO2
O2 cylinders checked	Yes ☐	No ☐
Capnography in place:	Yes ☐	No ☐
Chest movement and equal air entry:	Yes ☐	No ☐
Portable suction checked and functioning	Yes ☐	No ☐

Access		
Iv access	Site 1: Site Checked:	Size:
	Site 2: Site checked:	Size:

IO access:	**Site 1**	**Size & position:**
	Site 2	**Size & position:**
Checked on X-ray	**Yes ☐**	**No ☐**
Central line access:	**Type:** **Site checked:**	**Position and Size:**
Arterial line	**Site:** **Site Checked:**	**Clearly labelled:** **Yes ☐ No ☐**
Fluids		
Fluid resuscitation given:	**Type:**	**Volume mls/kg:**
Maintenance fluid:	**Rate**	**% of fluid allowance:**
Inotropes	**Concentration**	**mcg/kg/min**
Agent 1		
Agent 2		
Agent 3		
Monitoring		
ECG	**Yes ☐**	**No ☐**
B/P	**Yes ☐**	**No ☐**
Sao2	**Yes ☐**	**No ☐**
C02	**Yes ☐**	**No ☐**
Temperature Checked:	**Yes ☐**	**No ☐**
Warming blanket	**Yes ☐**	**No ☐**

D=Drugs	**Allergies**	**Patients Weight**
Drugs Sedation		
Agent 1:	**Rale:** **Bolus amount:**	**Mcg/kg/hr**
Agent 2:	**Rale:** **Bolus amount:**	**Mcg/kg/hr**
Agent 3:	**Rale:** **Bolus amount:**	**Mcg/kg/hr**
Emergency Drugs:	**Pre calculated**	
Adrenaline: **Atropine:** **Suxamethonium:**		
Disability		
Pupils Size	**Reaction**	**Shape**
R L		

Receiving hospital	**Informed and ready**	**Parents updated**	**All equipment secured**
	Yes ☐ No ☐	**Yes ☐ No ☐**	**Yes ☐ No ☐**

Appendix J – STPN Paediatric Emergency Airway Infographic

2026

MANAGING EMERGENCY PAEDIATRIC AIRWAYS

South Thames Paediatric Network
Transforming Healthcare for Children and Young People

ASSESSMENT AND PREPARATION

History Red Flags

- Prematurity
- Age <6 months
- Age <12 months + <10 kg
- Extremes of body weight
- Prescence of craniofacial syndrome
- Obstructive sleep apnoea
- Previous difficult Intubation
- Systemic illness (sepsis, cardiomyopathy, cardiac failure)

Examination Red Flags

- Respiratory distress/stridor
- Presence of foreign body
- Micrognathia
- Midface hypoplasia
- Congenital neck or airway mass
- Facial asymmetry
- Limited mouth opening
- Limited cervical spine mobility
- Obesity
- Trauma/ infection/ burns

Airway Plan

1) Formulate plans A, B, C and D as per the DAS guidelines. (QR1)
   - Verbalise the plan with the team.
2) Prepare for failure
   - Prioritise maintenance of oxygenation throughout all airway interventions.
3) Call for help early
   - In the presence of red flags consider whether you need a consultant or ENT team on site PRIOR TO INDUCTION.

QR1
DAS Guidelines

Before proceeding to intubation ask yourself these critical questions:

1) Is senior expertise required from the outset?
   - *Consider if you need consultant/ ENT presence for induction?*
2) Is all necessary equipment available and checked?
3) What is the rescue strategy if intubation fails?
4) Is this the appropriate setting?
   - *Should/can this child be transferred to theatre/another centre before intubation?*
   - *Close liaison with South Thames Retrieval Service*

INTRA-PROCEDURE

Getting the basics right

Teamworking

- Establish team roles and leaders.
- Use a paediatric checklist. (QR2)

Monitoring

- Oxygen saturation with audible tone
- Heart rate
- Blood pressure
- Continuous capnography

Equipment

- Calculate appropriately sized equipment. (QR3)
- Ensure presence of all necessary equipment (including sizes above and below). (QR4)
- Nasogastric tube – continuous aspiration from beginning of pre-oxygenation.
- Videolaryngoscope first line.

Drugs

- Ensure adequate depth of anaesthesia.
- Use of neuromuscular blockade (unless spontaneous ventilation is essential).
- Ensure maintenance drugs available.

Optimising airway and ventilation

- Correctly sized facemask
- Correctly sized oropharangeal airway
- T-piece circuit with adjustable PEEP
- Consider two-handed technique
- Position fingers on the bone of the mandible - avoid soft tissue compression

<2 years
- Neutral head position
- Shoulder roll & head ring
- Nasogastric tube with continuous aspiration

2-8 years
- Neutral head position
- Lift chin until optimal ventilation acheived

>8 years
- Sniffing the morning air position

Role of ENT in airway emergencies

- Every hospital is covered by an on-call ENT team. (QR5)
- Hospital should have essential ENT equipment available and easily accessible. We recommend use of a MAST (making airways safe trolley). (QR6)
- Examples of ENT roles in difficult paediatric intubation:
  - Airway visualisation
  - Ventilation via bronchoscope
  - Foreign body removal
  - Tracheostomy
- Early contact with ENT in the event of a suspected difficult airway.

Managing failure of plan A

- Oxygenation must be maintained throughout.
- Follow your airway plan to maintain oxygenation via a supraglottic airway or facemask ventilation.
- Once oxygenation has been achieved:
  Avoid repeating unsuccessful techniques
  - Change intubater
  - Reposition the patient
  - Change equipment (consider direct vs video vs fibreoptic)
  - Ensure adequate depth of a anaesthesia/ paralysis
- Contact ENT for bronchoscope ventilation.
- Unable to oxygenate and critical signs present (Sats <80% and HR dropping) declare can't intubate can't ventilate and move onto front of neck access.

QR2
Intubation Checklist
QR3
Equipment Compatibility Guide
QR4
Kit Dump
QR5
Out of hours ENT provision
QR6
Emergency Airway Trolley Kit List

FRONT OF NECK ACCESS (FONA)

Declare failed airway
- Ensure ENT is notified and on their way
- Ensure muscle relaxation
- Continue oxygenation attempts whilst preparing

ENT immediately available?

No → **Alternative options:**
- Cannula cricothyroidotomy (venflon / quicktrach) (QR8)
- Cricothyroidotomy - Scalpel, Bougie, Tube (QR9)

Yes → **ENT options:**
- Tracheostomy
- Cricothyroidotomy
- Rigid bronch and intubate
- Ventilating bronchoscope

Use pre-prepared FONA packs to ensure rapid access to essential equipment. (QR7)

QR7
FONA packs
QR8
Cannula Cricothyroidotomy
QR9
Surgical Cricothyroidotomy

For guidance ONLY, not a substitute for experienced clinical judgement. Always consult local policy where available.

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Appendix K - QR codes to supporting documents

Checklist and Kit Dump

STPN MANAGING EMERGENCY PAEDIATRIC AIRWAYS INFOGRAPHIC

STPN PAEDIATRIC EMERGENCY INTUBATION AIRWAY MANAGEMENT ALGORITHM

STPN EMERGENCY AIRWAY CHECKLIST

STPN EMERGENCY AIRWAY KIT DUMP

DAS Algorithms

DIFFICULT MASK VENTILATION

DIFFICULT TRACHEAL INTUBATION

CAN'T INTUBATE, CAN'T VENTILATE

EMERGENCY AIRWAY EQUIPMENT COMPATIBILITY GUIDE

STPN eFONA packs

EMERGENCY AIRWAY ENT EQUIPMENT LIST AND TROLLEY DESIGN

STPN OUT OF HOURS ENT PROVISION

STPN EFONA PACK LABELS

STPN EFONA PACKS

STPN EMERGENCY FRONT OF NECK GUIDANCE

STPN CANNULA CRICOTHYROIDOTOMY

STPN SURGICAL CRICOTHYROIDOTOMY

STPN EMERGENCY AIRWAY PRE-TRANSPORT CHECKLIST