# Management of Difficult Airway Scenarios

## Difficult Bag and Mask Ventilation
- Optimise head position / chin lift / jaw thrust
- Try two person bag mask technique
- Use oral / nasal airway (avoid injuries / bleeding!)
- Insert NG/OG tube and use continuous gastric decompression with a 20 / 50 ml syringe
- If relaxant given: laryngoscopy to assess difficulty of intubation
- If cannot intubate and cannot ventilate go to CICV scenario
- See APAGBI guideline for difficult mask ventilation for more details

## Anticipated Difficult Tracheal Intubation
- Abnormal anatomy: micrognathia / midface hypoplasia / macroglossia etc.
- History: difficult intubation / airway problems / stridor etc.
- Discuss with KIDS consultant / local paediatric anaesthetist / local ENT
- Is intubation necessary? (alternatives: high flow O2, CPAP, NIV)
- Consider inhalational induction (discuss with KIDS consultant)
- Prepare team (ENT) / equipment / drugs (sugammadex 16 mg/kg)
- Prepare for rescue plan / CICV scenario
- See the APAGBI guideline for difficult tracheal intubation for more details

## Cannot Intubate Cannot Ventilate (CICV)
- Activate emergency airway call (including ENT) if available
- Use 100% O₂
- Try LMA / two person bag mask technique
- If SpO₂ > 80%: consider reversing muscle relaxation (sugammadex 16 mg/kg if rocuronium / vecuronium used)
- Prepare for surgical airway (ENT available) or Needle cricothyroidotomy (ENT not available)
- Prepare team / equipment / drugs to deliver CPR
- Follow the APAGBI cannot intubate cannot ventilate guideline

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**KIDS hotline: 0300 200 1100**

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**OXYGENATE first; use 100% O₂**
**CALL FOR HELP early**
**MOST EXPERIENCED operator**

**Unanticipated Difficult Tracheal Intubation**
- Oxygenate first, use 100% O₂
- If unable to ventilate and SpO₂ < 90%, go to CICV scenario
- Call for help (local senior anaesthetist / local ENT / KIDS)
- NG/OG tube and use continuous gastric decompression
- Try alternative laryngoscope - blade / stylet / boogie / smaller ETT
- Try LMA (<3 attempts)
- Prepare team / equipment / drugs for secondary intubation (indirect laryngoscopy/fiberoscopy if equipment and expertise available)
- See the APAGBI guideline for difficult intubation for more details

**If intubation succeeds, follow the routine process**
Difficult mask ventilation (MV) – during routine induction of anaesthesia in a child aged 1 to 8 years

Step A Optimise head position
- Consider:
  • Adjusting chin lift/jaw thrust
  • Inserting shoulder roll if <2 years
  • Neutral head position if >2 years
  • Adjusting cricoid pressure if used
  • Ventilating using two person bag mask technique

Step B Insert oropharyngeal airway
- Assess for cause of difficult mask ventilation
  • Light anaesthesia
  • Laryngospasm
  • Gastric distension – pass OG/NG tube

Step C Second-line: Insert SAD (e.g. LMA™)
- Insert SAD (e.g. LMA™) – not > 3 attempts
- Consider nasopharyngeal airway
- Release cricoid pressure

Consider changing:
- Circuit
- Mask
- Connectors
If equipment failure is suspected, change to self-inflating bag and isolate from anaesthetic machine promptly

Call for help again if not arrived

- SpO₂ >80%
  - Good airway
  - Yes
  - No
  - SpO₂ <80%
  - Attempt intubation
    - Consider paralysis

Maintain anaesthesia/CPAP
- Deepen anaesthesia (Propofol first line)
  - If relaxant given – intubate
  - If intubation not successful, go to unanticipated difficult tracheal intubation algorithm

Wake up patient
- Proceed
- Go to scenario cannot intubate cannot ventilate (CICV)

SAD = supraglottic airway device
Unanticipated difficult tracheal intubation – during routine induction of anaesthesia in a child aged 1 to 8 years

**Step A** Initial tracheal intubation plan when mask ventilation is satisfactory

- **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

- **Failed intubation with good oxygenation**

- **Failed oxygenation e.g. SpO₂ <90% with FiO₂ 1.0**
  - 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-depolarising relaxant

**Step B** Secondary tracheal intubation plan

- **Insert SAD (e.g. LMA™) – not > 3 attempts**
  - Oxygenate and ventilate
  - Consider increasing size of SAD (e.g. LMA™) once if ventilation inadequate

- **Failed intubation via SAD (e.g. LMA™)**
  - Consider modifying anaesthesia and surgery plan
  - Assess safety of proceeding with surgery using a SAD (e.g. LMA™)

**Call for help again if not arrived**

- **Succeed**
  - **Safe**
    - Consider 1 attempt at FOI via SAD (e.g. LMA™)
    - Verify intubation, leave SAD (e.g. LMA™) in place and proceed with surgery

- **Failed intubation via SAD (e.g. LMA™)**
  - **Unsafe**
  - **Safe**

- **Failed ventilation and oxygenation**

**Ensure:** Oxygenation, anaesthesia, CPAP, management of gastric distension with OG/NG tube

- **Verify ETT position**
  - Capnography
  - Visual if possible
  - Auscultation

- If ETT too small consider using throat pack and tie to ETT
- If in doubt, take ETT out

- **Postpone surgery**
  - Wake up patient

- **Proceed with surgery**

- **Postpone surgery**
  - Wake up patient

- **Go to scenario cannot intubate cannot ventilate (CICV)**

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*S 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

**Failed intubation inadequate ventilation**

**Step A** Continue to attempt oxygenation and ventilation
- FIO₂ 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 SpO₂ >80%
- If rocuronium or vecuronium used, consider sugammadex (16mg/kg) for full reversal
- Prepare for rescue techniques in case child deteriorates

**Step C** Airway rescue techniques for CICV (SpO₂ <80% and falling) and/or heart rate decreasing
- Call for specialist ENT assistance

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**ENT available**
- Percutaneous cannula cricothyroidotomy / transtracheal jet ventilation (pressure limited)
- Call for help again if not arrived

**ENT not available**
- Call for help

**Succeed**
- Continue jet ventilation set to lowest delivery pressure until wake up or definitive airway established
- Consider:
  - Surgical tracheostomy
  - Rigid bronchoscopy + ventilate / jet ventilation (pressure limited)

**Fail**
- Perform surgical cricothyroidotomy / transtracheal and insertion of ETT / tracheostomy tube*
- Consider passive O₂ insufflation while preparing

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*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

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**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
- Connect to either:
  - adjustable pressure limiting device, set to lowest delivery pressure
  - 4Bar O₂ 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 upper airway patency to aid expiration

**SAD = supraglottic airway device**