



## Clinical Guidelines

# Upper airway obstruction (UAO)

### Document Control Information

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## Assessment

The most pertinent clinical sign is stridor, which is usually an inspiratory noise, but sometimes can be both inspiratory and expiratory.

### Not to be confused with:

- Wheeze: a sign of lower airway obstruction and narrowing.
- Stertor: signifies upper airway collapse in children with decreased conscious state, pharyngeal hypotonia or swallowing problems.

Causes of stridor in the UK population:

Common	Uncommon	Rare
Viral laryngotracheobronchitis (croup)	Epiglottitis	Angioneurotic oedema
	Bacterial tracheitis	Diphtheria
	Laryngeal foreign body	Retropharyngeal abscess
Superimposed infection on subglottic stenosis or laryngomalacia	Inhalational injury (burns)	
	Anaphylaxis	
	Severe bilateral tonsillar enlargement	

### Key message

Identify and treat serious upper airway obstruction. Once the airway is secure, time can be spent on identifying the specific cause for UAO.

### Specific points in history:

- Is this a first presentation?
- Is there history of previous intubations or previous difficulty with intubation?
- Is the airway stable?

### Danger signs and useful pointers to the cause of UAO:

- Sudden or rapid onset – *foreign body, epiglottitis, tracheitis, anaphylaxis*
- Soft or low pitched stridor – *epiglottitis, tracheitis*
- Toxic appearance and high fever - *epiglottitis, tracheitis, retropharyngeal abscess*
- Drooling, open mouth, sitting forward - *epiglottitis, retropharyngeal abscess, severe tonsillar obstruction*

## Initial management

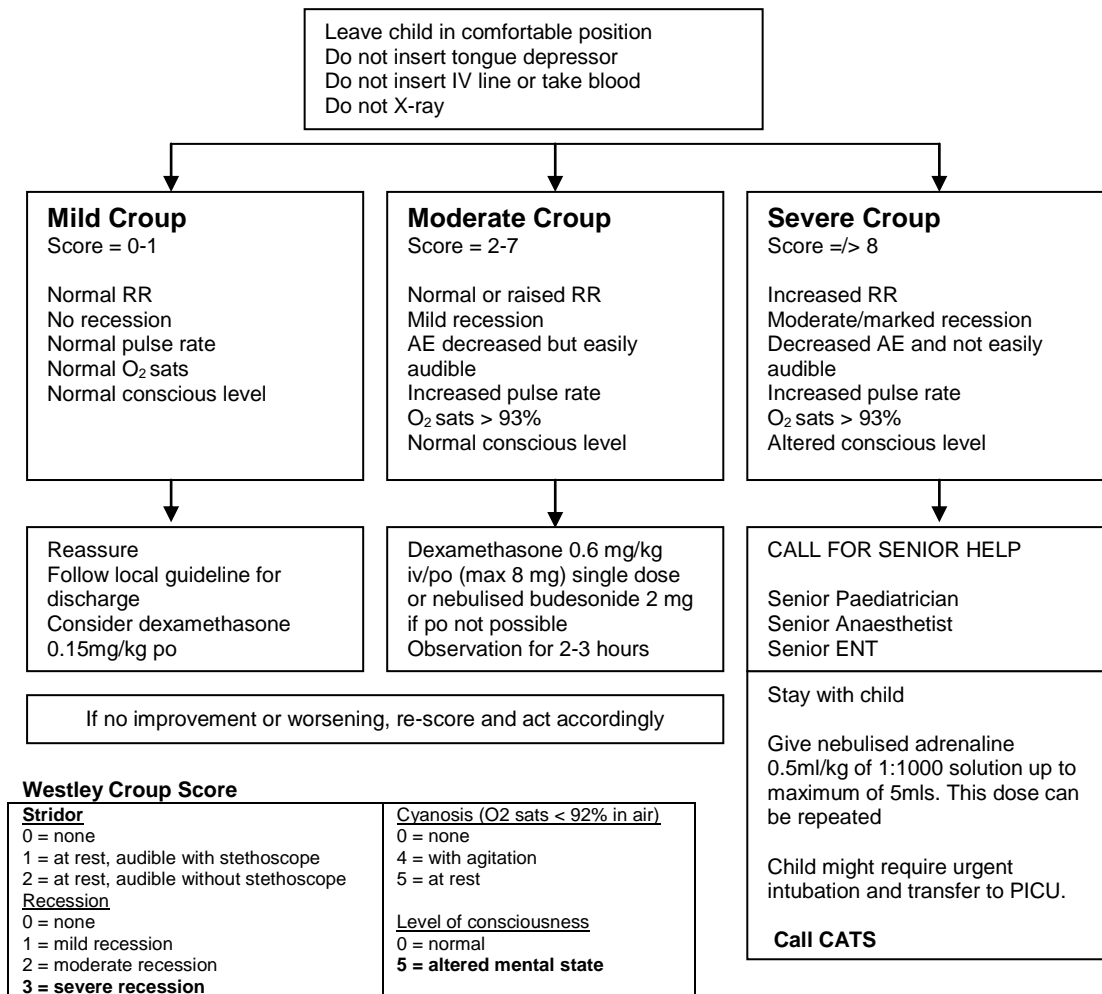
Irrespective of the cause for UAO, some general management guidelines apply:

### 2.1 General management: AVOID UPSETTING THE CHILD

- 2.1.1 Leave child with parent in a comfortable position
- 2.1.2 DO NOT insert tongue depressor
- 2.1.3 DO NOT attempt IV access or blood tests
- 2.1.4 DO NOT ask for a Chest or lateral neck X-ray
- 2.1.5 DO NOT force an oxygen mask over face.
- 2.1.6 Adrenaline nebulisers may temporarily relieve severe airway obstruction, usually in a dose of 0.5 ml/kg of 1:1000 solution, up to a maximum of 5 ml. The effect of adrenaline is temporary.
- 2.1.7 Pulse oximetry is a poor guide to severity when oxygen is delivered
- 2.1.8 Consider Heliox

### 2.2 Specific management of selected conditions:

2.2.1 **Viral croup:** summarized in flow chart.



Croup score 0-1: Mild croup  
 Croup score 2-7: Moderate croup  
 Croup score >=8: Severe croup

### 2.2.2 Epiglottitis:

DO	DO NOT
<p>Call for senior help</p> <ul style="list-style-type: none"> <li>• Paediatric SpR/Consultant</li> <li>• Anaesthetic SpR/Consultant</li> <li>• ENT SpR/Consultant</li> </ul> <p>Allow the child to remain in its favoured position</p> <p>The child should be constantly supervised by someone skilled in intubation</p> <p>Give humidified oxygen as tolerated</p>	<p>Attempt oropharyngeal examination, since this may precipitate complete obstruction</p> <p>Attempt insertion of an iv cannula or take blood</p> <p>Send the child for neck x-ray or other x-ray</p> <p>Upset the child e.g. removing parents</p> <p>Leave the child unsupervised</p> <p>Rely only on pulse oximetry</p>

- 2.2.3 **Foreign body obstruction:** The management depends on the site and severity of airway obstruction. Intubation may result in further impaction of the foreign body, and should be considered ONLY when there is impending/actual cardio-respiratory arrest. The anaesthetist will then try to visualize/clear the object under direct laryngoscopy. Otherwise, examination under anaesthetic with rigid bronchoscopy by ENT team is the best option.
- 2.2.4 **Bacterial tracheitis:** Stridor may be soft or absent even in severe airway obstruction. Consider early intubation by anaesthetist. After intubation the ET may become blocked with secretions.
- 2.2.5 **Inhalational injury:** Along with the history, other pointers may include soot in sputum, singed nasal hair, soot around mouth and face, and facial burns involving mouth and nose. The airway must be secured at the earliest opportunity. Delay can lead to progressive airway obstruction due to oedema and a situation where intubation becomes impossible. Call anaesthetic team and intubate electively.

### Indications for intubation

- Suspected epiglottitis
- Inhalational injury
- Fall in conscious level
- Increasing respiratory failure
  - Rising pCO<sub>2</sub>
  - Exhaustion
  - Hypoxia (SpO<sub>2</sub> <92% despite high-flow O<sub>2</sub> by mask >5 L/min)

## Management at Intubation

The most experienced anaesthetist must be present at the intubation. Most anaesthetists would favour a gas induction. The resuscitation team should have a back up oxygenation strategy prepared.

Anticipate a difficult airway. [Refer to the difficult airway guidance from APA/DAS]

It may be necessary to use croup tubes rather than standard ETT. These are longer than standard ETT, but come in similar sizes, and may be necessary in situations where severe airway narrowing mandates a much smaller ETT than indicated by age.[e.g. a 4.0 mm ETT for a 6 year old].

## Management following intubation

- Once the airway obstruction is bypassed, most children are easy to ventilate. Exceptions might be in case of bacterial tracheitis (pulmonary involvement), inhalational injury (ARDS), or anaphylaxis (bronchoconstriction).
- Ensure that the ETT is securely taped.
- **Use sedation and paralysis to ensure safety of ETT.**
- Following a difficult intubation, an ETT should only be changed if there is a clear clinical reason which justifies this risk.
- Start adjunctive treatments such as iv dexamethasone (0.15 mg/kg QDS) in case of croup; or ceftriaxone (80 mg/kg) in case of epiglottitis or tracheitis.
- Blood cultures must be taken in suspected cases of infection.
- In case of inhalation injury and burns, start fluid replacement as per burns guidance.
- Patients with bacterial tracheitis may become septic, requiring fluid resuscitation and inotropic support.

## Transport considerations

- Children with an unstable airway should not be transported without detailed discussion with the CATS consultant.
- ETCO<sub>2</sub> monitoring is mandatory during transfer to maintain continuous correct ETT placement.
- Use continuous muscle relaxation during retrieval to ensure safety of ETT.
- If transporting an un-intubated child with suspected foreign body obstruction, avoid unnecessary delay and transfer immediately to ENT centre (directly to theatres if necessary). The team must have a strategy to manage unexpected obstruction or hypoxia.