

NHS CATS
Children's Acute Transport Service



Clinical Guidelines

Upper airway obstruction (UAO)

Document Control Information

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Assessment: Call senior clinicians immediately

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.

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 assessment

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

Prevalence in UK	Diagnosis	Key Features
COMMON	<i>Viral laryngotracheobronchitis (croup)</i>	Peak incidence in second year of life Barking cough, stridor, low-grade fever, hoarse voice Symptoms often at night
UNCOMMON	<i>Epiglottitis</i>	Peak incidence 1-3yrs Acute presentation High fever, soft stridor, drooling, open mouth "Toxic"
	<i>Bacterial tracheitis</i>	Average age 4-6yrs Preceding URTI Stridor, hoarse voice, high fever, respiratory distress "Toxic"
	<i>Laryngeal foreign body</i>	Peak incidence age 1-2yrs Acute onset Coughing, choking, stridor Respiratory distress
	<i>Inhalational Injury</i>	History of exposure to smoke Carbonaceous deposits around mouth, sputum
	<i>Anaphylaxis</i>	Acute onset Exposure to triggers Itching, urticaria, facial swelling Cardiovascular compromise
	<i>Severe bilateral tonsillar enlargement</i>	Neck pain and swelling Dysphagia
RARE	<i>Angioneurotic oedema</i>	Acute onset Localised angioedema Can affect any part of body
	<i>Diphtheria</i>	Recent travel



		Low grade fever Neck pain and swelling Greyish adherent pseudo membrane
	<i>Retropharyngeal abscess</i>	Neck pain and swelling, dysphagia, trismus Inspiratory stridor, fever

Initial management

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

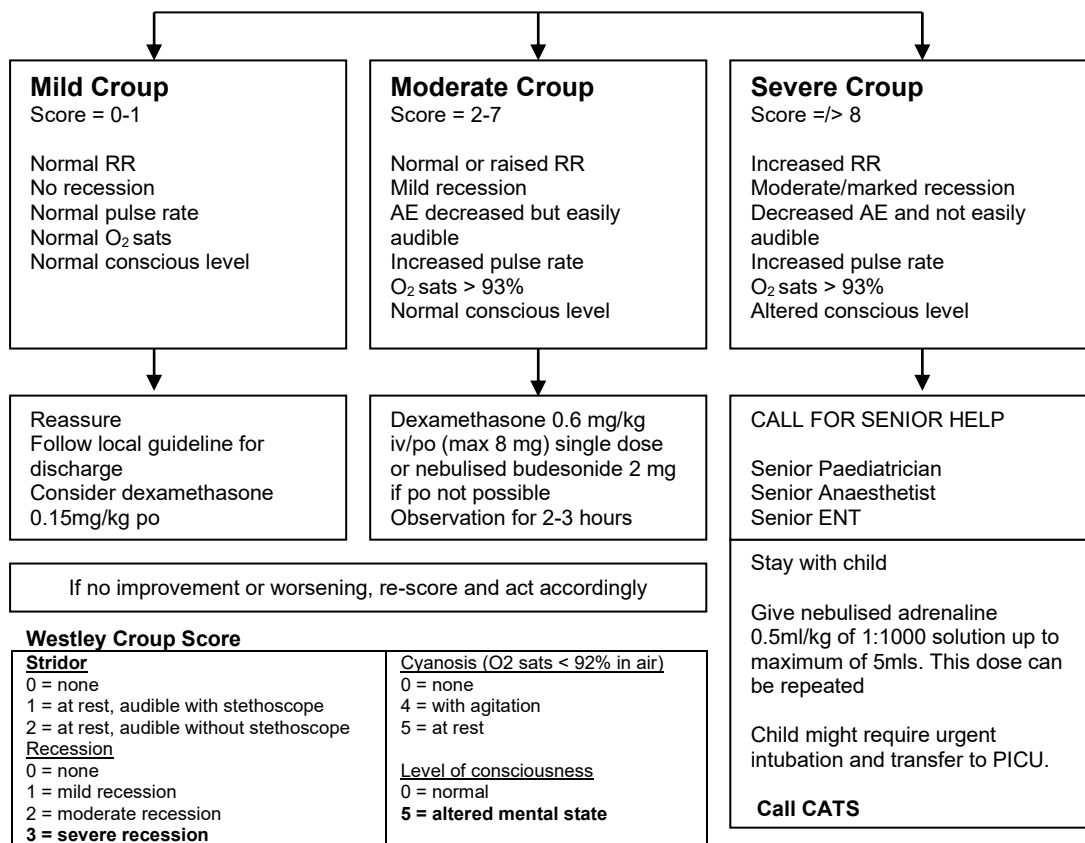
General management: AVOID UPSETTING THE CHILD

- Leave child with parent in a comfortable position.
- DO NOT insert tongue depressor.
- DO NOT ask for a chest or lateral neck X-ray.
- DO NOT force an oxygen mask over face.
- Adrenaline nebulisers may temporarily relieve severe airway obstruction. Dose is *0.5 ml/kg of 1:1000 solution, up to a maximum of 5 ml*. The effect of adrenaline is temporary.
- IV access should be considered with caution

Pulse oximetry is a poor guide to severity when oxygen is delivered.

Specific management of selected conditions

Viral croup: summarized in flow chart.



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

Epiglottitis

DO	DO NOT
✓ Call for senior help • Paediatric SpR/Consultant • Anaesthetic SpR/Consultant • ENT SpR/Consultant ✓ Allow the child to remain in its favoured position ✓ The child should be constantly supervised by someone skilled in intubation ✓ Give humidified oxygen as tolerated ✓ Administer IV antibiotics when airway secured	○ Attempt oropharyngeal examination, since this may precipitate complete obstruction ○ Send the child for neck x-ray or other x-ray ○ Upset the child e.g. removing parents ○ Leave the child unsupervised ○ Rely only on pulse oximetry

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 the ENT team is the best option.

Bacterial tracheitis

- Stridor may be soft or absent even in severe airway obstruction.
- Consider early intubation by anaesthetist.
- After intubation the ETT may become blocked with secretions.
- Administer IV antibiotics once the airway has been secured.

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 senior anaesthetic team and intubate early.

Indications for intubation

- Suspected epiglottitis
- Inhalational injury
- Fall in conscious level
- Increasing respiratory failure
 - Rising pCO₂
 - Exhaustion
 - Hypoxia (SpO₂ <92% despite high-flow O₂ by mask >5 L/min)

Management at intubation

- Ensure ENT support sought early.
- Most experienced anaesthetist must be present at the intubation.
- Consider a gas induction.
- Anticipate a difficult airway. (Refer to the difficult airway guidance from APA/DAS)
- Consider video laryngoscopy.
- Ensure a back-up oxygenation strategy is prepared (LMA, front of neck access)

Anticipate a smaller ETT than indicated by age

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 muscle relaxation
- 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 require fluid resuscitation and vasoactive support.

Transport considerations

- Children with an unstable airway should not be transported without detailed discussion with the CATS consultant.
- ETCO₂ monitoring is mandatory during transport to ensure continuous correct ETT placement.
- Use continuous muscle relaxation during transport to ensure safety of ETT
- If transporting an un-intubated child with suspected foreign body obstruction, avoid unnecessary delay and transport immediately to ENT centre (directly to theatres if necessary).
- The team must plan a strategy to manage unexpected obstruction or hypoxia with the CATS consultant.