EdWISE

Basic and Advanced Airway Management

For on site tutorials as part of the remote simulation program

Paediatrics: 5

This project was possible due to funding made available by Health Workforce Australia

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An Australian Government Initiative

NSW GOVERNMENT Health

Sydney Clinical Skills and Simulation Centre

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Introductions

General Aims

- Learn in a team setting
- Blend clinical skills with team skills
- Reflect critically on practice

Ground Rules

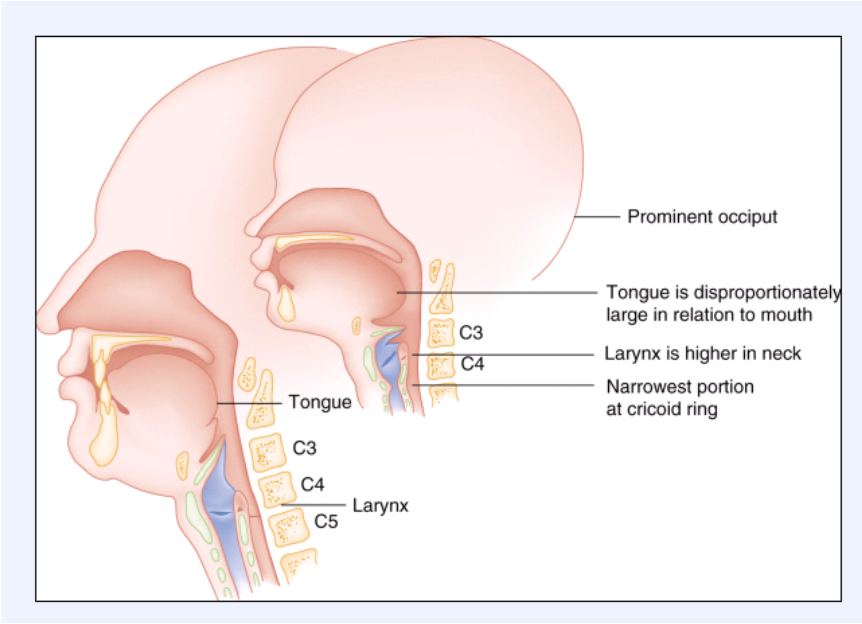
- Participation
- Privacy
- Confidentiality
- Disclaimer
- Debriefing
- Mobile phones

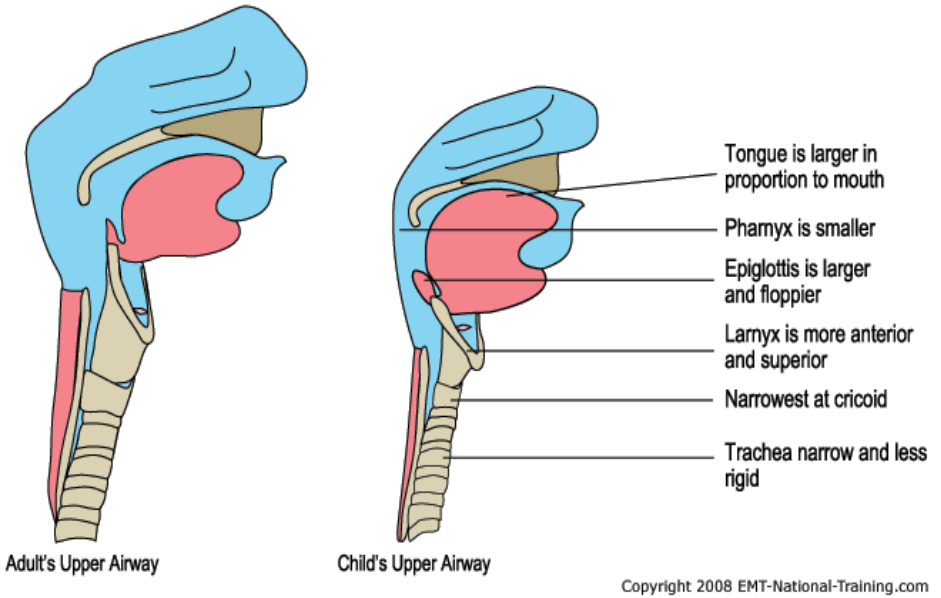
Session Objectives

- Review an approach to the paediatric airway
- Rehearse basic and advanced airway management
- Demonstrate communication and teamwork skills

Scenario

Anatomical & Physiological differences





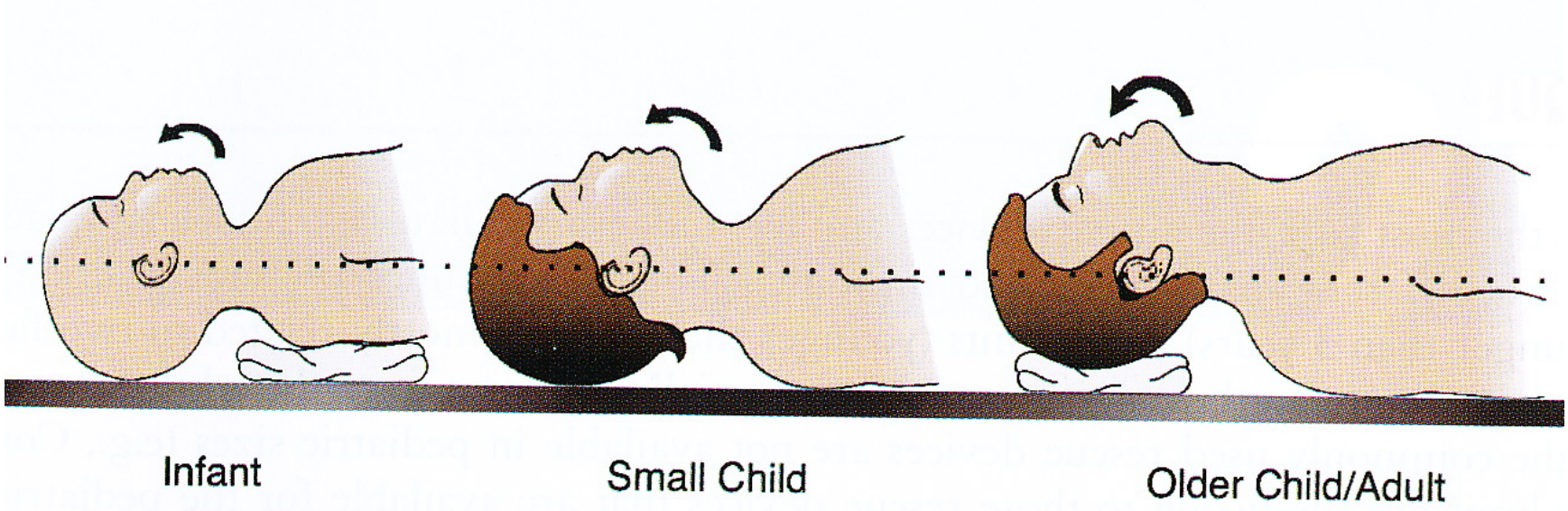
Airway Management

- Position the head/body
- Jaw thrust, chin lift, head tilt
- Apply Oxygen
- Consider foreign bodies and removal steps
- Suction
- Airway adjuncts
- Intubation
- Difficult Airway Plan

Position the Head

- Place a towel under the shoulders will place the airway in a better alignment

Position the Head

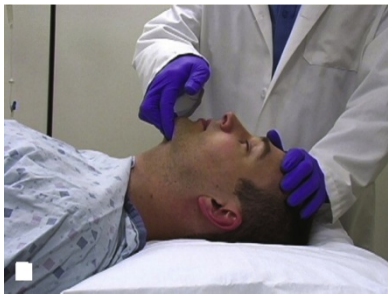


Use a line passing through the external auditory canal and anterior to the shoulder to determine optimal airway alignment

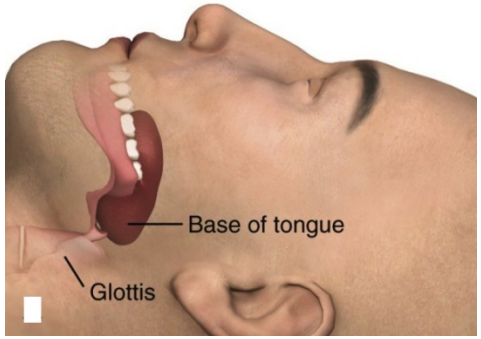
From Ron M Walls, Manual Of Emergency Airway Management 3rd Edition 2008

Open The Airway

- Tongue is the aetiology of the top 5 causes of upper airway obstruction!!!



Chin Lift

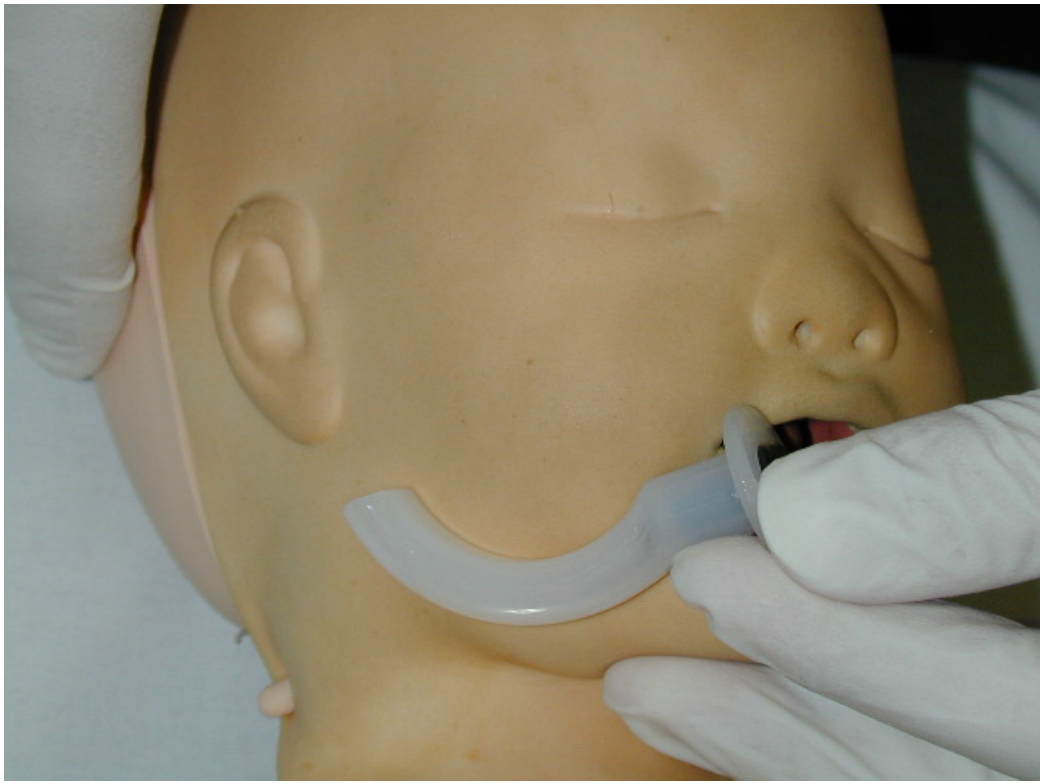


Jaw Thrust

Airway Adjuncts

- Oropharyngeal airway (OPA)
  - Use in unconscious child to keep the tongue from occluding the posterior pharynx
  - Can not use it in patients with an intact gag reflex
  - Insert concave down using a tongue depressor to assist

Centre of the incisors to the angle of the Jaw

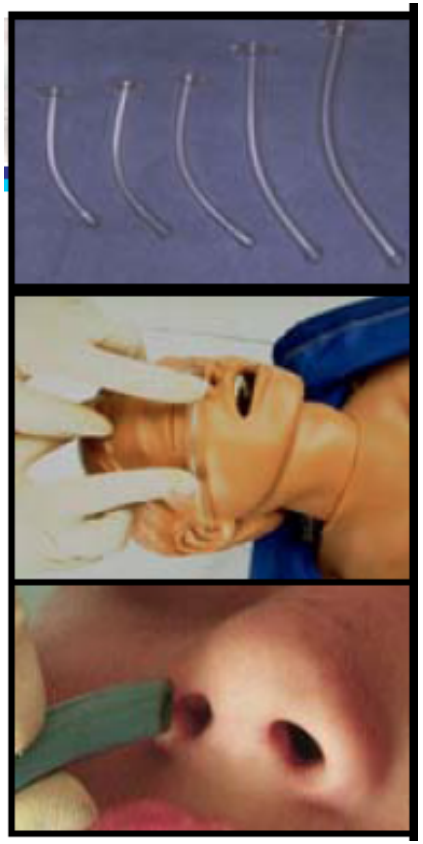


Tongue Depressor

Insert concave down

Nasopharyngeal Airways

- Length: tip of the nares to the tragus
- Width: < size of nostril
- Contraindication : Base of skull fracture
- Very well tolerated, use lots of lubricant and do not force in



Bag and Mask Ventilation

- Measure from the bridge of the nose to the cleft of the chin
- Ensure good seal
- Avoid direct compression of the eyes (vagal)

Bag and Mask Ventilation

- Bag size
  - Adult 800-1200ml
  - Paediatric 750ml
  - Infant 290-500ml
  - Neonatal 80-120ml

EC Clamp hand technique

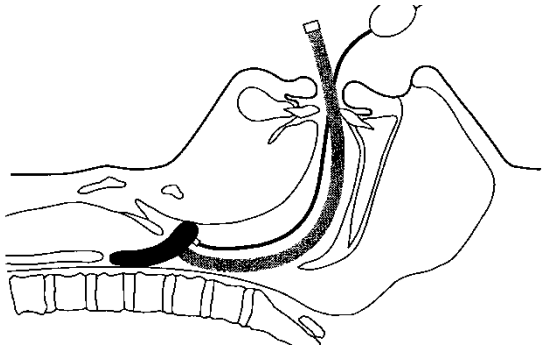
- C holds mask to the face
- E pulls chin into the mask (makes a clamp)
- Beware of too much pressure on the submental area
- Do not be afraid to use 2 hands to hold mask

Bag Mask Ventilation

- Control rate and volume
- Give only amount of air needed to get the chest to rise
- Say Squeeze (just until chest rise is initiated) and then say release, release

Laryngeal Masks

- Forms low pressure seal around larynx
- No protection from aspiration
- Useful in can not intubate can not ventilate scenario, cardiac and respiratory arrests and in novice intubators



LMA sizing

Size	Patient Age/Weight	Max Cuff Inflation
1	Neonates/Infants (<5 kg)	4 mL
1.5	Infants (5-10 kg)	7
2	Infants/Children (10-20 kg)	10
2.5	Children (20-30 kg)	14
3	Children (30-50 kg)	20

When should I intubate?

- Inadequate airway protection
- Inability to ventilate and/or oxygenate
  - Shock
  - Respiratory failure
- To keep small children still
  - Transfer to another facility or for investigation
- Allow safe and adequate analgesia and sedation for procedures
- Predicted deterioration of the child

Rapid Sequence Induction

- Preparation
- Protection and positioning
- Pre-oxygenation
- Paralysis with Induction
- Placement of ET tube in trachea
- Post intubation management

Blade size

- Miller 0 – premature infant or small newborn
- Miller 1 – normal newborn to 12 kg (2 years)
- Miller 2 – 13-24 kg (7 years)
- Macintosh blade may be used after 2 years of age
- Too small a blade can get you into trouble (Miller 2 after 2 (years))

ED Intubation Checklist

Team

- ☐ ED Consultant aware of RSI?
- ☐ Out-of-hours, if difficulty anticipated, anaesthetics contacted?
- ☐ All members introduced by name & role and each briefed in turn by TL
- ☐ Difficult intubation plan briefed?
- ☐ Difficult airway trolley at hand?
- ☐ Anticipated problems – does anyone have questions or concerns?

Patient

- ☐ Pre-oxygenation optimal?
  - Add nasal prongs or NIV
- ☐ Patient position optimal?
- ☐ Patient haemodynamics optimal?
  - Fluid bolus?
  - Pressor?
- ☐ Does it look like it might be difficult:
  - Difficult BVM?
  - Difficult laryngoscopy?
  - Difficult cricothyroidotomy?

IVI/Drugs

- ☐ Fluids connected, runs easily?
- ☐ Spare IVC?
- ☐ Monitor: ECG, BP, SaO2.
- ☐ RSI drugs drawn up, doses chosen?
- ☐ Post-intubation anaesthesia plan - drugs drawn up?

Equipment

- ☐ Suction working?
- ☐ BVM with ETCO2 connected
- ☐ OPA and NPA available?
- ☐ 2 x laryngoscopes working? Correct blade size?
- ☐ Tubes chosen, cuff tested
- ☐ Bougie or stylet in tube?
- ☐ Tube tie or tapes ready?
- ☐ Ventilator circuit available?
- ☐ LMA sized & available?

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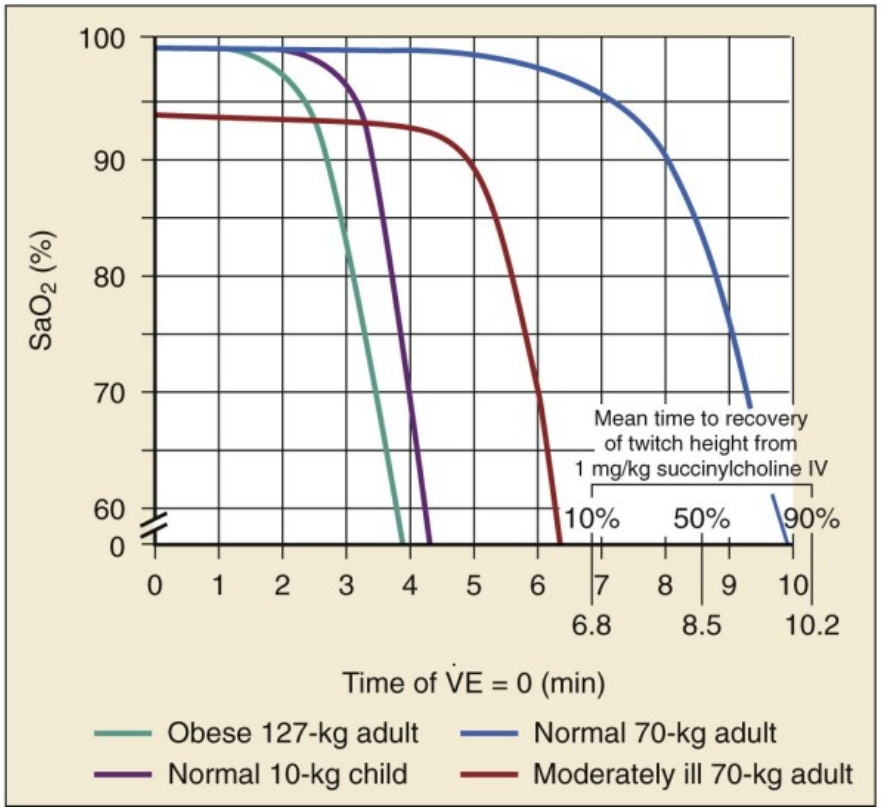
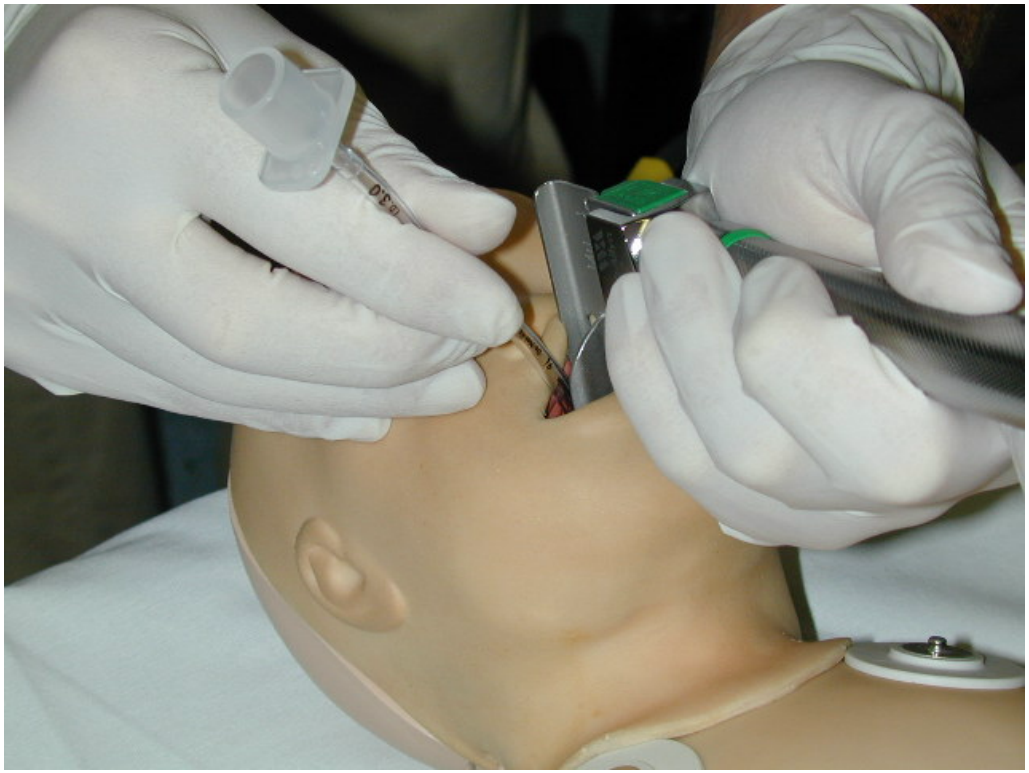
Preoxygenate

- De-nitrogenation
  - Use 100% oxygen
  - Infants become hypoxic quickly
  - This is not the time to practice intubation
  - Avoid positive pressure ventilation

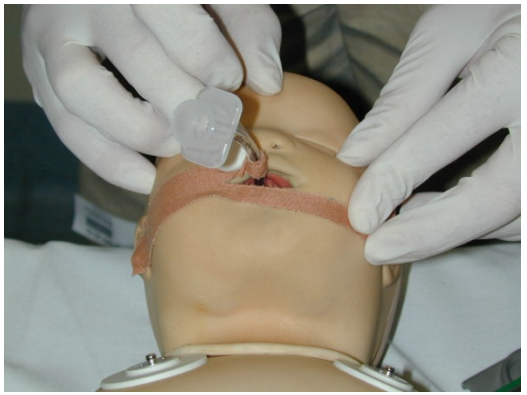


Paralyse and Place



Post Intubation Management

- Confirm position of tube
- Tape tube
- CXR
- Sedatives
- Ventilation strategies
- Ongoing Management



Scenario

Summary

- A calm approach provides structure to airway management.
- Simple maneuvers and positioning should be carefully optimised in children.
- Equipment choices are sized based and can be assisted with charts.
- An early request for experienced assistance is best practice for intubation.

References

- http://www.das.uk.com/content/paediatric-difficult-airway-guidelines
- Weiss and Engelhardt Proposal for the management of unexpected difficult pediatric airway, Paediatric Anaesthesia 2010, 20:454-464
- Advanced Paediatric Life Support Manual, 5th Edition

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