Clinical Guidelines

Cuffed Endotracheal Tubes

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Indications

As a group, the paediatric intensive care population is intolerant of low pressure endotracheal leak;

- Stiff lungs need high positive end expiratory pressure (PEEP)
- Higher peak airway pressures may be required
- Gas consumption for PEEP on transport needs to be minimised

It is also desirable to minimise the number of re-intubations, especially in the early emergency/stabilisation phase.

In general for emergency referrals to CATS we would suggest the use of a cuffed endotracheal tube and if changing a tube we would replace with a cuffed one.

Cuffed endotracheal tube use in children remains controversial.

Sizing

Internal diameter (i.d)

Motyama formula: \( \text{internal diameter (mm)} = \frac{\text{age}}{4} + 3.5 \)

Cuff pressure

Inflate to just obliterates leak (can assess aurally/using intra oral \( \text{CO}_2 \))

Ideally < 20 cm H\(_2\)O

Depth (clinical assessment vital)  \( \text{length (cm)} = \text{Oral} \ (\frac{\text{age}}{2} + 12) \)

Nasal (\( \frac{\text{age}}{2} + 15)\)

Complications and hazards

- The ‘Black line’ as a guide to depth: this may result in inadvertent endobronchial intubation.
- Avoid laryngeal cuff placement
- Monitor cuff pressures (manometer) and consider the relative risks of cuff pressure on tracheal perfusion in low cardiac output states.
Transport considerations

- Aeromedical transports: A climb in altitude will increase cuff pressure and this should be monitored/adjusted until cruise altitude.

Key messages

- PICU children may require higher peak and positive end expiratory pressures than would be routine in elective anaesthesia.
- With a cuffed endotracheal tube it is possible to compensate for a slightly 'small' endotracheal tube or a patient with deteriorating lung compliance and increasing airway pressure requirements.

If in doubt discuss with duty CATS consultant.

References

5. Yoneda I. A simple method to control tracheal cuff pressure in anaesthesia and air evacuation. Anaesthesia 1999; 54:975-980