

Paediatric Airway Scenario

Oopsy Daisy

General description

This is a paediatric airway scenario involving a child with an 'at risk' airway from facial trauma and closed head injury. It involves the need for good assessment skills and timely decision making. The child will need endotracheal intubation because of a falling level of consciousness along with oral bleeding.

The scenario creates the opportunity for the team to discuss the timing of interventions, a safe approach to the traumatised airway and paediatric intubation/sedation/paralysis issues.

The emotional and high stress aspects of this scenario highlight the importance of supportive team working within a setting of the need for expeditious assessment and intervention.

A brief note on this scenario description

Vital signs are given as a guide. It is impossible, when writing a scenario, to predict how the scenario will progress, so please feel free to alter them, within reason, to fit the clinical situation. Changing vital signs should not be a way of playing games or 'punishing' actions.

Included are a few useful 'resources' on the bottom right side of the page that relate to this scenario. Also included are resources that provide interesting background information relating to airway care.

Last minute reminders

- Fun
- Fast
- No one 'on the spot' too much
- Never 'punish' an action
- It's about relationships and team working...and team success
- Foster group problem solving
- The written scenario is a 'guide'. The skilled facilitator will adjust it to fit clinical interventions, learners needs, emotion of the moment etc.....success is important!

Resources

- RSI resources in Critical Procedures at theCAREcourse.ca
- Paediatric RSI article: fhs.mcmaster.ca/pediatrics/documents/RSI.pdf
- NODESAT emcrit.org/preoxygenation/

Oopsy Daisy

Background *(read aloud at outset)*

NAME—Oopsy Daisy.

An 8 year old child is brought in by the ambulance. She fell out of a tree that she was climbing with her older cousin. She is said to have hit a branch on the way down and landed at the base of the tree on soft forest ground. She was quiet for about 20 seconds and then started crying gently. The older child fetched an adult and the ambulance was called.

On arrival she is collared, supine on a clam-shell or spine board, the paramedic is suctioning her mouth because of bleeding and her repeated coughing. She is quiet but her eyes are open.

Initial Vitals

Appears	HR 105	BP 106/58	RR 34	Temp 36.6 ax	O₂ Sat 99% on O ₂
	Eyes 4	Verbal 3	Motor 4	Gluc 4.1	

Additional History (info given *if* participants ask)

Symptoms / Story

“What’s going on?”

Allergies Not known

Meds Nil

Past Medical History Unimmunised. Croup (not needing admission) aged 2

Last Meal About 2 hours prior to arrival. Carrot sticks and hummus.....and left over Halloween candy.

Events As above

Initial Assessment

Parent present and distressed.

Laceration to bottom lip and cheek. 2 lower teeth missing.

Airway—'bubbly', secretions and blood.

Breathing—tachypnoea.

Circulation—as per vitals, hands and feet cool.

Repeat Vitals (at about 5 mins)

Appears	HR 106	BP 104/56	RR 34	Temp 36.3 ax	O₂ Sat 98% on O ₂
	Eyes 2	Verbal 2	Motor 4		Gluc 4.4

Repeat Vitals (post-intubation)

Appears	HR 100	BP 102/54	RR –	Temp 36.3 ax	O₂ Sat 100% on O ₂
	Eyes –	Verbal –	Motor –		Gluc 4.1

Developments (depending on management)

1. Lateral position / dependent airway position and/ or gentle suctioning may help with airway control.
2. Supporting ventilation with bag-valve-mask would be difficult because of the facial trauma.
3. Airway management will require sedation and paralysis – and suction because of the oral bleeding.
4. Post intubation care (early recheck of vital signs, deal with hypotension, blood gases or ventilate to end-tidal CO₂).
5. Intubation success is important—assist the learner, if necessary, to ensure that success.
6. If intubation is achieved early, move on to monitoring, bagging technique (rate, volume, and *smooth*), ventilator use (if available)—and transport considerations.
7. Can add an episode of post-intubation hypotension—use of pressors, fluids to rescue this.

Repeat Vitals (if running a post-intubation hypotension episode)

Appears	HR 100	BP 78/40	RR -	Temp 36.3 ax	O₂ Sat 100% on O ₂
	Eyes -	Verbal -	Motor -		Gluc 4.1

These vitals can improve with the use of pressors and a fluid bolus.

Learning opportunities

1. Management of the traumatised airway—sitting forwards often helps (difficult when there is the possibility of spinal injury)—or use of 'dependent' (self draining) lateral position.
2. Early decision making around controlling the airway.
3. Attention to pre-oxygenation—non-rebreather mask with reservoir bag—avoid positive pressure ventilation if possible (so as not to inflate the stomach)—gentle sedation (not in this scenario) may be needed to allow adequate pre-oxygenation.
4. Use of nasal cannulae for apnoeic oxygenation—'NODESAT'.
5. Discussion of cuffed vs uncuffed tubes (cuffed is best but can discuss using least pressure in cuff to achieve prevention of an air leak (to avoid pressure necrosis from the cuff).
6. Mitigating the three main risks of intubation—aspiration (suction, be ready to roll the patient)—can't intubate, can't ventilate (rescue airway tray, good pre-oxygenation)—hypotension (large bore IV, pre-drawn push-dose pressors).
7. Importance of avoiding/noticing post intubation hypotension in head injury (dramatic negative effect on outcomes from a single episode of hypotension in the head injured patient. Cycle the BP monitor as soon as possible after the tube is passed. Use of 'push dose pressors' pre-drawn up.

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Learning opportunities *(continued from the previous page)*

8. Early need for maintenance sedation (rocuronium is a long acting paralytic, etomidate (if used) is a short acting (5-10 minutes) anaesthetic agent).
9. Pros (paralysis, less likely to extubate) and cons (masking of seizures) of maintenance paralytic.
10. Discussion around seizure prophylaxis in head injury.
11. Ventilator settings for this age/size child.
12. Team working in a stressful situation.
13. Team debrief.

Outcomes

- Can be varied to suit participants.
- Good response from opening airway but this will need a definitive airway—intubation.
- Could vomit at the time of IV push of induction agent—need to roll to protect the airway.
- Can vary intubation—from uneventful, to unable to intubate, requiring a rescue airway (King airway / LMA)—easy intubation followed by hypotension, etc.
- A successful final outcome achieves best learning.

RSI medications

- Anaesthetic agent—etomidate or ketamine.
- Paralysis—rocuronium (long acting, non-depolarising) vs. succinylcholine / suxamethonium (shorter acting, depolarising, more serious adverse effects and other issues).