

1. Which is true of a patent airway
 - a) Lack of a gag reflex indicates a high risk of aspiration
 - b) Spontaneous swallowing is not helpful in assessing airway patency
 - c) As a part of an assessment of a patent airway it is important to initiate a gag reflex
 - d) Signs of a partial airway obstruction include anxiety, coughing, stridor and wheeze

2. Regarding laryngospasm which is **not** true
 - a) It can occur post traction on the pelvic and abdominal viscera
 - b) Hypoxia and hypercapnia depress the activity of laryngeal adductor neurons and can self-limit laryngospasm
 - c) Laryngospasm is more common in adults than children
 - d) Laryngospasm and bronchospasm occurs more frequently after a recent URTI

3. What maximal Fi oxygen percentage is correct with respect to its delivery device
 - a) Nonrebreather with reservoir and one way valve – max FiO₂ = 90%
 - b) Simple face mask – max FiO₂ = 40%
 - c) Standard nasal cannula – max FiO₂ = 30%
 - d) Venturi mask – max FiO₂ = 40%

4. Regarding Non-invasive ventilation which is **not** correct?
 - a) Absolute contra-indications include vomiting with aspiration risk and decreased level of consciousness
 - b) There is good evidence for use of NIV in asthma
 - c) BIPAP has not been shown to be superior to CPAP in acute pulmonary edema, although no mortality benefits have been demonstrated
 - d) BIPAP is preferred method of NIV in COPD and NIV reduces mortality by 50%

5. Which situation should BIPAP not be used
 - a) Flail chest in a trauma patient as it worsens mortality
 - b) Immunocompromised patients as it increases inhospital mortality
 - c) Prehospital setting as it makes no difference to intubation inhospital
 - d) Presence of abdominal compartment syndrome as it can over distend the stomach

6. Which physiological characteristic in children is correct
- Extracellular fluid compartment is proportionally smaller so lower doses per kilogram is needed for certain intubating drugs
 - Attempts at intubation should stop once Saturations drop below 80% as this is the level below where pO₂ rapidly drops
 - Children have relatively lower FRC compared to adults so have a smaller oxygen reserve makes preoxygenation less effective
 - Children can develop gastric distention easier as the incidence of aspiration in children is quite high
7. Which anatomical difference in airways between infants and adults is **not** correct
- Infants have a large head and occiput
 - A disproportionately large tongue and small mandible
 - Superior larynx and anterior cords with a long stiff epiglottis
 - Narrowest part of the airway is glottis opening
8. Which advanced airways procedure is easier in a child <10 years old
- Positive pressure Bag Valve Mask ventilation
 - Blind nasotracheal intubation
 - Surgical cricothyrotomy
 - Needle cricothyrotomy
9. Which is **not** an accurate formulation for paediatric airway equipment estimations
- ETT size = $\text{age} / 4 + 4$ for age > 1 years old
 - Broselow weight based measurements
 - Depth of tube from lips = $\text{age} / 2 + 12$
 - ETT size = $(\text{age} + 16) / 4$
10. Which is **not** correct about airway equipment
- Oropharyngeal airways can be measured by length from center of mouth between first incisors to the angle of the mandible
 - Nasopharyngeal airways can be measured from nostril to meatus of the ear
 - Tube depth at lips can be estimated at 4 x ETT size in cm
 - The Pressure relief valve in a paediatric bag valve mask system opens at pressures greater than 35cmH₂O

11. Which induction agent dose is correct
- Ketamine 4 mg/kg
 - Propofol 4 mg/kg
 - Succinylcholine 1.5 mg/kg at all ages
 - Rocuronium 3 mg/kg
12. Which is **not** a contraindication of succinylcholine
- Burns or crush injuries > 3 days old
 - Myasthenia Gravis
 - Duchenne muscular dystrophy
 - Raised intraocular pressure
13. Which is **not** a complication of succinylcholine
- Hypokalaemia
 - Malignant hyperthermia
 - Masseter spasm
 - Prolonged apnea with pseudocholinesterase deficiency
14. Regarding pre-treatment in RSI in children which is correct
- Pre-treatment is routinely recommended in RSI
 - Laryngospasm can cause bradycardia and atropine should be given to treat but not to prevent this
 - Pre-treatment of a non-depolarizing muscle relaxants before succinylcholine is recommended
 - Lignocaine pre-treatment improves outcome in children with reactive airways
15. Which is recommended post intubation in children
- Immobilize head and neck in a neutral position in young children
 - In children <10kg initial rate should be 15-20 breaths/min
 - For children <30kg a pediatric colorimetric end tidal CO₂ detector can be used
 - Initial tidal volumes of 5ml/kg is recommended
16. Which of the following would provide a **false positive** reading on capnography?
- Cardiac arrest
 - Severe pulmonary oedema with copious secretions

- c) Massive obesity
- d) Oesophageal intubation with recent ingestion of carbonated drinks

17. Which is **not** a predictor of difficult bag valve mask ventilation

- a) Snoring
- b) Obesity
- c) Full Dentures
- d) Facial hair

18. Which is a predictor of difficult intubation

- a) Mallampati class 2
- b) Cervical laminectomy
- c) Three fingers distance between mentum and hyoid bone
- d) Two finger distance between hyoid to thyroid

19. Which peri-intubation strategy is not harmful when utilized in a patient with head injury

- a) Trendelenburg position
- b) Aim pCO₂ < 30
- c) Ketamine induction
- d) Increase PEEP to >10 to avoid hypoxia

20. Which statistic is **not** true of c.spine injury evaluations

- a) Nexus Criteria has 5% miss rate of clinically significant c.spine injury
- b) Plain xrays have a 30% miss rate of c.spine injuries
- c) Canadian C.spine rule has <1% miss rate of clinically significant c.spine injury
- d) CT scans have a <1% miss rate of c.spine injuries

Answers

1. D (up to 37% of healthy volunteers do not have a gag reflex, do not initiate a gag reflex if airway may not be protected, patients who do not spontaneously swallow are at high risk for airway compromise)
2. C (more common in children than adults particularly after a recent respiratory tract infection)

3. A (simple face mask 60% at 15 L/min, nasal cannula 40% at 4 L/min, Venturi 60%, CAMERON 4TH EDITION page 24-25)
4. B (Not enough studies to show NIV benefits asthma, Torres et al. Noninvasive Ventilation: Update on the uses for the Critically Ill Patient. *EM Critical Care* 2011)
5. D (Improved mortality with flail chest and immunocompromised patients, reduced intubation rates if used prehospital)
6. C (ECF compartment is larger so need higher dose per kg, sats < 90% has a precipitous drop in pO₂, the incidence of aspiration is quite low even in emergent intubation)
7. D (narrowest part of the airway is cricoid)
8. A (BVM even in airway oedema as inflammation and obstruction due to croup is usually below glottis opening, blind nasotracheal intubation harder due to bleeding from large adenoids and tonsils, surgical cricothyrotomy harder as cricothyroid membrane too small so needle cricothyrotomy preferred but not necessarily easier)
9. B (Broselow is height base measuring tape, from LITFL paediatric airway revised 20/4/2014)
10. C (ETT length = 3 x ETT size)
11. C (Ketamine and propofol 1-2 mg/kg, rocuronium 1mg/kg, succinylcholine <10 yo 1.5-2 mg/kg; >10 yo 1-1.5 mg/kg)
12. B (Myasthenia Gravis resistant to succinylcholine more sensitive to non-depolarizing muscle relaxants but it is not contraindicated, ozemedicine.com/wiki/doku.php?id=suxamethonium)
13. A (Hyperkalaemia rise of 0.5 mmol in normal patients and greater in rhabdo, burns, muscular dystrophies, neuromuscular disease, crush injuries, spinal cord injuries, tetanus, botulism etc)
14. B (pre-treatment with lignocaine, non-depolarizing muscle relaxants and atropine not routinely recommended, lignocaine may be considered in raised intracranial pressure)
15. A (children <10kg should have 20-25 breaths per min, peak pressure 15-20 mmHg, tidal volume of 8-12 ml/kg, use pediatric colorimetric end tidal CO₂ if < 15kg)
16. D (false positive from oesophageal ETT with carbonated drinks with not persist after 6 breaths)
17. C (dentures facilitates BVM)
18. B (Mallampati 3 = 5% chance of poor visualization, Mallampati 4 = 20%)
19. C (Ketamine is safe in head injured patients and may be cerebroprotective, high levels of PEEP will impair cerebral venous drainage due to high intrathoracic pressure, high CO₂ vasodilates cerebral vessels but low CO₂ vasoconstricts)
20. A (Compared to Canadian c.spine rule Nexus criteria had a larger sample size; included pediatric populations; may be less sensitive for older populations and had a sensitivity of 99.6% vs 100% in Canadian c.spine rule for clinically significant c.spine injuries)