

A scenic coastal landscape at sunset. A winding elevated highway bridge with concrete pillars spans across the ocean, curving from the foreground towards the horizon. The sky is filled with vibrant colors of orange, pink, and purple, transitioning into a darker blue at the top. The ocean is calm, reflecting the colors of the sky. In the foreground, there are green and brownish plants on a hillside. The background shows distant mountains and a coastline.

Resuscitation & Critical Care

Single Choice Questions (SCQ) and Extended Match Questions (EMQ)

Emergency Medicine Fellowship Program

- 1) which of the following is true
 - a. 2010 guidelines put emphasis on epinephrine
 - b. rescue breaths are no longer recommended in all age groups
 - c. open chest CPR is shown to reduce ROSC and mortality
 - d. compression:ventilation is 30:2 in adults and children where medical professional is present
 - e. EtCO₂ correlates well with coronary perfusion and survival

- 2) In ALS which of the following is true:
 - a. Adrenaline dose is 1ml (1:10,000) every 2nd cycle
 - b. Commencement of adrenaline timing is different in shockable vs non-shockable rhythm
 - c. Check rhythm immediately after shock and commence CPR if no pulse
 - d. NaHCO₃ should not be used in any arrest situation as it causes myocardial depression
 - e. Lignocaine is contraindicated in ischemic VT

- 3) Therapeutic hypothermia (TH), which is true
 - a. TTM trial recommends cooling to 36
 - b. TTM is endorsed by ARC
 - c. ILCOR recommends TH in all OHCA patients
 - d. Rewarm at 0.5-1 degree per hour over 8 hours and use bear hugger if needed
 - e. TTM failed to show a difference in mortality in two intervention groups (33 vs 36)

- 4) In PALS which is true
 - a. Blood taken from IO route can reliably be used for biochemistry and cross matching
 - b. Drugs given via IO route have slower onset so a bigger dose should be given
 - c. If unstable SVT, dose of electricity is 4J/kg in children
 - d. Age/4 +4 is a good formula to calculate cuffed ETT size
 - e. Airway is best managed in neutral position in children

- 5) In PRBS transfusion
 - a. Compatible with N/S and Hartmann's soln
 - b. Febrile non hemolytic reactions are due to donor antibodies reacting against recipient RBC.
 - c. Transfusion related acute lung injury (TRALI) is due to patient antibodies reacting to donor WBC
 - d. Stored blood has increased Ph and Ca
 - e. APO in TRALI usually occurs after 8 hours

- 6) Regarding inotropes
 - a. Nor-epi causes vasodilation in muscles via B₂ receptors
 - b. Metaraminol causes reflex bradycardia
 - c. Isoprenaline can be used in Mx of TdP
 - d. Ephedrine causes reflex brady
 - e. Dose of epinephrine in anaphylaxis is 0.3-0.5ml (1:10,000) IM

- 7) In assessment of shock
- a. Mortality increases by 10% for every 5 below SBP 110
 - b. R wave in lead 2 correlates with hypovolemia
 - c. Non collapsing IVC on bedside US excludes hypovolemia
 - d. IVC diameter <15mm and >50% collapse with inspiration is a good predictor of fluid responsiveness
 - e. Passive leg raise test is not a predictor of fluid responsiveness
- 8) In Shock
- a. Hypotensive resus is indicated when haemorrhage cannot be controlled
 - b. 10ml/kg PRBC raises HB by 1 in children
 - c. Dopamine is 1st line rx in cardiogenic shock
 - d. Metaraminol has both A and B receptor activity
 - e. Absence of B lines on lung US indicates patient needs more fluid

1. Question

Which one of the following statements is indicative of the correct CPR technique in an adult:

- Compression should comprise 50% of the cycle
- The ventilation : compression ratio should be 2:5
- The depth of compression should be approximately 1/5 of the thoracic diameter
- The rate of compression should be at least 80/min in adults

1

Depth of compression should be 5 – 6cm (>1/3 of the thoracic diameter).
Ventilation compression ratio should be 2:30. The compression rate should be 100-120/min.

2. 2. Question

Which one of the following is the most important in the treatment of cardiac arrest

- Delivery of supplemental oxygen
- Therapeutic hypothermia
- Effective cardiac compression
- Adequate ventilation

3

Effective cardiac compression to maintain coronary perfusion is the most important of the choices given. Oxygenation is important, however coronary perfusion of poorly oxygenated blood is still better than no coronary perfusion of highly oxygenated blood. Ventilation is usually only required to maintain oxygenation, whilst restoration of normal acid base status is probably of no benefit and possibly harmful. Hypothermia may have a role to play following ROSC from ventricular fibrillation, but is never an initial priority.

3. 3. Question

The preferred initial sequence of management of asystole is which one of the following:

- Commence CPR / obtain IV access / administer adrenaline 1mg / repeat adrenaline every 1-3 minutes/perform endotracheal intubation
- Commence CPR / obtain IV access / administer adrenaline 2mg / perform endotracheal intubation /repeat adrenaline every 1-3 minutes
- Commence CPR / obtain IV access / perform endotracheal intubation / administer atropine 1mg / administer adrenaline every 1-3 minutes
- Obtain IV access / perform endotracheal intubation / commence CPR / administer adrenaline 1mg / repeat adrenaline every 1-3 minutes

1

Early intubation is most likely harmful as some interruption of CPR is usually required. It is best deferred until the patient fails to respond to initial CPR and defibrillation attempts or demonstrates ROSC. Chest compressions should only be ceased at the time the intubator is about to insert the laryngoscope into the patient's mouth and intubation should be achieved within 10 seconds. The initial dose of adrenaline is 1mg, repeated every 2 minutes.

4. 4. Question

In relation to palpation of the pulse during cardiac arrest, which one of the following statements is incorrect:

- The femoral or brachial pulse should be palpated in infants
- It should be felt for 10 seconds during a rhythm check in normothermic patients
- It can be felt for every minute during cardiac arrest
- It does not need to be checked whilst performing CPR

4

The pulse can be palpated as often as you like during CPR, however stopping CPR to perform a rhythm and pulse check should only occur 2 minutes after

each intervention in ACLS, and not at all in BLS. The pulse should be felt for no longer than 10 seconds in normothermic patients during a rhythm check.

5. 5. Question

The preferred initial sequence of management of pulseless electrical activity is which one of the following:

- Commence CPR / obtain IV access / administer adrenaline 1mg / check for treatable causes / repeat adrenaline every 1-3 minutes / perform endotracheal intubation
- Check for treatable causes / commence CPR / obtain IV access / perform endotracheal intubation / administer adrenaline 1mg / repeat adrenaline every 1-3 minutes
- Commence CPR / obtain IV access / administer atropine 1mg / check for treatable causes / perform endotracheal intubation / administer adrenaline every 1-3 minutes
- Obtain IV access / perform endotracheal intubation / commence CPR / administer adrenaline 1mg / repeat adrenaline every 1-3 minutes / check for treatable causes

1

6. 6. Question

Regarding basic CPR which of the following statements is incorrect:

- Head tilt is contraindicated in suspected cervical spine injury
- Initially 5 breaths should be given
- Expired air contains approximately 4% carbon dioxide
- The correct location for cardiac compression is over the lower 1/2 of the sternum

2

2 breaths should be given initially. Previous BLS guidelines advocated 5 initial breaths.

7. 7. Question

In cardiac arrest due to ventricular fibrillation, which one of the following management sequences is preferred:

- Commence external cardiac massage / apply monitor to determine rhythm / defibrillate

- Commence external cardiac massage / apply monitor to determine rhythm / perform endotracheal intubation / defibrillate
- Perform endotracheal intubation / commence external cardiac massage / apply monitor to determine rhythm / defibrillate
- Commence external cardiac massage / establish IV access / apply monitor to determine rhythm / defibrillate

1

8. 8. Question

During CPR, the adequacy of the operator performing chest compression usually starts to reduce between

- 2-3min
- 3-4min
- 1-2min
- 0-1min

3

A 10-20% reduction in compression depth occurs by 90 sec., despite operators not necessarily feeling fatigued. This is the reason that changing operators at least every 2 minutes (usually at the time of pulse check) is required.

9. 9. Question

Regarding cardiac arrest in pregnancy which one of the following is correct:

- A postmortem Caesarean section may be considered if the foetus has a gestational age of > 20 weeks / the time from arrest is < 15 min / the cause of maternal death is not haemorrhagic shock or obstetric related
- Displacement of the uterus to the left should occur during (and after) CPR
- Chest compression should occur over the mid sternum to prevent damage to the fetus
- The risk of pulmonary aspiration decreases with advancing gestational age

2

10. 10. Question

Regarding cardiac arrest in severe hypothermia which of the following is incorrect:

- The pulse should be felt for 30 seconds before deciding it is absent
- Active core rewarming techniques should be used until body temperature exceeds 31 degrees then recommence defibrillation as required
- Anti-arrhythmic drugs are usually ineffective in severe hypothermia
- Oxygen consumption is much lower in the hypothermic patient and therefore may be able to survive a more prolonged arrest than a normothermic patient

2

Initial defibrillation should be attempted at any temperature, but if unsuccessful, active core rewarming techniques should be used until body temperature exceeds 30 degrees then recommence defibrillation as required

11. 11. Question

Which of the following statements is incorrect:

- An appropriate tidal volume for a patient in cardiac arrest is 500mL
- The resting O₂ consumption in an adult is 250 mL/min
- An appropriate minute volume for a patient in cardiac arrest is 4 litres / min
- An appropriate respiratory rate for a patient in cardiac arrest is 12/min

3

12. 12. Question

Regarding endotracheal drug delivery which one of the following statements are incorrect:

- It should only be used if IV access is unable to be obtained after 5 minutes
- Amiodarone may be delivered via the endotracheal tube
- Endotracheal drug delivery delivers a significant decrease & delay in peak serum levels compared with IV administration
- 5 - 10 forceful ventilations should be given following endotracheal drug delivery

2

13. 13. Question

Regarding cardiac arrest following poisoning which one of the following statements is incorrect:

- The prognosis for most patients with poisoning is worse than that of older patients with cardiogenic cardiac arrest
- Naloxone is an antidote for clonidine toxicity
- Diazepam and adrenaline are antidotes for chloroquine toxicity
- HCO₃ therapy may be indicated

1

14. 14. Question

Common causes of spurious rhythms may include all of the following except:

- Coarse Parkinsonian tremor can mimic atrial flutter
- Shivering may mimic ventricular fibrillation
- Very fine VF can be misinterpreted as asystole
- Deep breathing may mimic 2:1 heart block

4

15. 15. Question

The actual correct management sequence of BLS in cardiac arrest is as follows:

- DRSCAB
- SDRABC
- DABRCS
- DRSABC

1

The actual correct sequence is Danger Response Send for help Compressions Airway Breathing. The 'S' was added in 2010 but unfortunately the 'ABC' sequence was not changed in the acronym did not change from DRSABC as this was thought to be potentially confusing for people already familiar with the 'ABC' sequence.

Q 7. A 1 year old baby is confirmed to be in cardiac arrest. At the initial rhythm check, the rhythm is confirmed as ventricular fibrillation. Which of the following are the CORRECT next steps in management?

- A) Shock with 4J/kg and then continue CPR for 2 minutes
- B) Shock with 4J/kg and then check for a palpable pulse
- C) Shock with 4K/kg, then continue CPR and give IV adrenaline at 10 mcg/kg dose
- D) Continue CPR and give IV adrenaline at 10 mcg/kg dose

Q 8. In regards to drug administration during resuscitation for cardiac arrest, which if the following is CORRECT?

- A) Adrenaline 1 mg is given after the first shock and then every second loop
- B) Adrenaline 1 mg is given after the first rhythm check
- C) Amiodarone 300 mg is given after the third shock
- D) Amiodarone 300 mg is given after the second shock

Resuscitation measures in ED

- a. DC shock at 150 J biphasic
- b. Adrenaline 1mg IV
- c. Amiodarone 150mg IV
- d. Sodium Bicarbonate 100mmol IV
- e. CPR
- f. Endotracheal intubation
- g. Transcutaneous cardiac pacing
- h. Infusion 20mL/kg crystalloid fluid IV rapidly
- i. Adrenaline 0.3 – 0.5mg IM
- j. Insertion 14g cannula in second intercostal space mid-axillary line

For the following scenarios pick the most appropriate resuscitative measure to perform from the listed options

1. A 66 year old man with a past history of IHD presents with sudden onset fast palpitations. He is pale with altered conscious state, has a faintly palpable radial pulse but no recordable BP. A 12 lead ECG demonstrates a regular wide complex tachycardia at 180/minute
2. A 20 year old woman is brought to your ED with marked wheezing, and facial and tongue oedema of 20 minutes duration. She has no medical past history. She is alert and distressed with a systolic BP of 70mmHg
3. An 84 year old man presents with severe urosepsis and a BP of 80/30 mmHg
4. A visitor to your ED collapses on the floor at her husbands bedside. On examination she is unresponsive and has no detectable pulse.
5. A man is brought to ED for assessment of burns and increasing breathlessness after being caught in a burning building an hour earlier. He is alert with normal vital signs and oximetry, and facial burns.

Answers

1. a

2. i

3. h

4. e

5. f

MCQ Anaesthetics

1.If adrenaline is used with local anesthetic in a finger block, which drug can be used to reverse vasospasm?

- a) aramine
- b) GTN
- c) Hydrallazine
- d) Phentolamine
- e) Theophylline

2.the absorption from highest to lowest is

- a) intercostals, peripheral nerve, subcutaneous
- b) subcutaneous, peripheral nerve, intercostals
- c) peripheral nerve, intercostals, subcutaneous
- d) intercostals, subcutaneous, peripheral nerve
- e) they are all the same

3.The recommended local anesthetic dose for intercostals blocks is what percentage of maximum for peripheral blocks?

- a) 50
- b) 25
- c) 15
- d) 10
- e) 5

4.For a median nerve block at the wrist the needle is inserted

- a) lateral to flexor carpi radialis
- b) directly lateral to palmaris longus
- c) at the medial border of palmaris longus

- d) through palmaris longus
- e) none of the above

5. Which statement is incorrect with regards to ulnar nerve blocks at the wrist

- a) the ulnar nerve lies lateral to the artery
- b) the ulnar nerve lies lateral to flexor carpi ulnaris
- c) the site of needle insertion is directly lateral to flexor carpi ulnaris
- d) lignocaine with adrenaline can be used safely
- e) if lignocaine is used the block lasts for 1-2 hours

6. Which statement is incorrect?

- a) the nail bed of the middle finger is supplied by the median nerve
- b) the nail bed of the fifth finger is supplied by the ulnar nerve
- c) the total anaesthetic agent which should be used in a finger block is 4 ml
- d) the palmar and dorsal digital nerves are superficial to their arteries
- e) the dorsum of the whole hand distal to the DIP is supplied by the radial nerve

7. Which statement is incorrect with regards to the plantar surface of the foot?

- a) it is mostly supplied by the posterior tibial nerve
- b) the saphenous nerve is blocked between the medial malleolus and tibialis anterior
- c) often two nerves need to be anaesthetised for an adequate block
- d) for a posterior tibial nerve block anaesthetic is injected lateral to the posterior tibial artery at the upper border of the medial malleolus
- e) the sural nerve is blocked inferior to the lateral malleolus

8. With regards to local anesthesia of the oral region which is incorrect?

- a) to anaesthetise the chin and lower lip a mental nerve block or an inferior alveolar nerve block can be done

- b) an intra oral mental nerve block is done where the lip meets the gum at the level of the first pre molar
- c) an external mental nerve block can be done in the same region
- d) local anaesthetic with adrenaline should not be used
- e) a midline laceration may need a bilateral block

9. Which is false with regards to intra oral nerve blocks?

- a) the technique is similar to that for a lingual nerve block
- b) and inferior alveolar nerve block will anaesthetise the chin and lower lip
- c) a lingual nerve block will anaesthetise the anterior two thirds of the tongue plus the floor of the mouth and the gums
- d) in such block the needle is inserted two cm along the lateral border of the ramus of the mandible
- e) the site of needle insertion is 1 cm above the third molar

10. which is true with regard to a laceration of the pinna of the ear?

- a) direct infiltration is a safe option
- b) adequate regional block is achieved by injecting LA from both a superior and inferior direction anterior to the ear
- c) adequate regional block is achieved by injecting LA from both superior and inferior directions posterior to the ear
- d) adequate regional block requires both an anterior and posterior block
- e) an intraoral approach provides the longest anaesthesia

11. Which is not true with regional blockade of the infraorbital nerve?

- a) it is found one cm inferior to the mid point of the lower margin of the orbit
- b) anaesthesia by a percutaneous route lasts longer than an intraoral route
- c) it anaesthetises the upper lip
- d) it anaesthetises the lower eyelid
- e) it anaesthetises the lateral side of the nose

12. Which is false with regards to a Bier's Block?

- a) If regional block lasts for 40 – 60 mins
- b) the minimal duration of cuff inflation is 20 mins
- c) bupivacaine can be used at a smaller dose of 1/mg/kg, but the cuff must remain up for at least 40 mins
- d) lignocaine can be used safely
- e) it is contraindicated in patients with sickle cell disease and Raynaud's disease

13. Which is false of methoxyflurane?

- a) it is found in the green sticks used for pain control in the ambulance
- b) it is an ether like substance
- c) it produces good analgesia with no anaesthesia
- d) adverse effects include delirium, hypotension, arrhythmias, and respiratory depression
- e) it is flammable
- f) it is contraindicated if there is a history of jaundice after halogenated anaesthetics

14. Which is a false statement with regards to nitrous oxide?

- a) when supplied as Entonox, it is 30% oxygen and 70% nitrous oxide
- b) it does not cause hypoxia when used as Entonox
- c) it does not cause significant depression or loss of airway reflexes
- d) it is a clear, odourless gas
- e) it supports combustion but is not explosive

15. Which of these induction agents increases ICP?

- a) ketamine
- b) thiopentone
- c) propofol
- d) fentanyl
- e) midazolam

16. Which is not a complication of succinylcholine?

- a) increased intragastric pressure
- b) histamine release
- c) masseter spasm
- d) malignant hyperthermia
- e) hypotension

17. Which is not a feature of the non-depolarising neuromuscular relaxant mentioned?

- a) pancuronium – tachycardia, long half life
- b) atracurium - short half life
- c) rocuronium – short duration of onset (1-3 mins)
- d) vecuronium – brief increase ICP
- e) vecuronium – lack of haemodynamic alterations

18. Which statement is false?

- a) lignocaine 1mg/kg may blunt the increase in ICP with instrumentation of the larynx.
- b) In this setting lignocaine should be given no more than 20 secs prior to other agents
- c) The standard adult blade for intubation is called the Macintosh blade

- d) The straight blade for paediatric intubation is the Miller blade
- e) The adult blade with a hinged tip that lifts the epiglottis is the McCoy blade

19. Which is an incorrect statement with regards to TAC?

- a) it is much more effective on scalp and facial wounds than extremities
- b) application is for 1 hour minutes to achieve sufficient local anaesthesia
- c) It must be kept in a locked cupboard
- d) It should not be used in wounds where adrenaline is contraindicated
- e) Significant toxicity through mucous membranes occurs, though low dose application on mucous membranes can occur safely
- f) LAT is as efficacious, can be used in the same way and does not require special storage

20. With regards to non invasive ventilation, CPAP, which is false?

- a) it recruits collapsed alveoli
- b) it prevents alveoli collapse
- c) it increases FEV1
- d) it improves FRC
- e) it improves alveolar fluid distribution

21. Which is the least likely adverse effect of CPAP?

- a) increase ICP
- b) barotrauma
- c) hypertension
- d) increase CO₂
- e) hypoxia

ANSWERS 1)D 2)A 3)D 4)B 5)C 6)E 7)E 8)D 9)D 10)D 11)B 12)B 13)E 14)A 15)A
16)E 17)D 18)B 19)B 20)C 21)C

MCQ anaesthetics

- 1) RSI
 - a. Diffult airway is a contraindication
 - b. Selective lung ventilation is an indication
 - c. BVM after induction/paralysis helps prevents earlier desaturation
 - d. GCS 3 is an indication for RSI
 - e. Video laryngoscope is shown to be more effective than standard technique in ED
- 2) All of the following are indicated in mnagement of HI patient undergoing RSI except
 - a. Elevate head end to 20-30 degrees
 - b. Keep MAP >80
 - c. Keep ETCO2 in low 30's
 - d. Fentanyl helps blunt spikes in ICP
 - e. Avoid un-necessary suctioning
- 3) RSI in asthma, all true except
 - a. Confusion is an indication of intubation
 - b. Goal is to use low pressures to avoid gas trapping
 - c. There is a risk of cerebral edema with permissive hypercarbia
 - d. Aim low RR, low Etco2 and O2
 - e. Increased expiratory phase time is a maneouver to avoid dynamic hyperinflation
- 4) RSI in obesity, all are true except
 - a. Obesity causes increased O2 demand and Co2 production
 - b. High flow nasal cannula decreases time to desaturation
 - c. Obesity causes decreased TLC, VC and chest wall compliance
 - d. Propofol and roc should be dosed according to actual body weight
 - e. VT is 6-8 ml/kg ideal body weight
- 5) Opioids, which is correct
 - a. Morphine causes IGE mediated histamine release
 - b. Previous allergy to codeine is not a contra-indication to morphine
 - c. Chest wall rigidity caused by fentanyl is not reversed by naloxone
 - d. Morphin 6 glucoronide is an inactive metabolite of morphine
 - e. Sedation score is a better predictor of opioid toxicity than resp rate
- 6) Match the drug with all the correct choices
 - a. Methadone SNRI activity
 - b. Pethidine prolonged QT

- c. Tramadol
 - Abuse potential
 - Serotonin syndrome
 - Longest half life

- 7) neuromuscular blocking drugs, which is incorrect
- a. dose of sux should be reduced by ~25% in pregnancy
 - b. sux is superior to high dose roc in achieving favourable intubating conditions
 - c. suggamadex and neostigmine work by different pathways to reverse NMBD
 - d. atropine helps to prevent cholinergic crisis in NMBD reversal
 - e. sux has shortest time of onset
- 8) which of the following is true
- a. pancuronium has minimal cardiac side effects
 - b. atracurium follows by hoffman's elimination
 - c. patients with MG are more sensitive to sux
 - d. non depolarizing NMBD are drug of choice in MG
 - e. infants <1 month old need higher dose of NMBD
 - f. Sux is the drug of choice in RSI in organophosphate poisoning
- 9) Suxamethonium
- a. 1:60,000 risk of malignant hyperthermia
 - b. in stroke and UMNL, sux is contraindicated upto 6 months
 - c. day 5 after burns is a contra-indication for sux
 - d. rise in K is usually >1mmol/l
 - e. fever is an early sign in malignant hyperthermia
- 10) malignant hyperthermia, outline true and false
- a. more common in males and children
 - b. digoxin, and extensive muscle trauma can cause MH
 - c. masseter spasm and rise in EtCo2 are late signs of MH
 - d. fever is an early sign
 - e. 25% patients will have symptoms >2hr after administration of offending agent
- 11) induction agents, which is true
- a. propofol and ketamine have analgesic properties
 - b. propofol is an antiemetic
 - c. ketamine is CI in head injury
 - d. haemodynamic instability caused by propofol needs inotropic support
 - e. ketamine is an antiemetic
- 12) which is false regarding ketamine
- a. can cause bronchorrhea and laryngospasm
 - b. is a bronchorelaxant
 - c. if administered IM, patient should be observed for atleast 2 hours
 - d. does not cause respiratory depression
 - e. should be used with caution in elderly and IHD patients
- 13) procedural sedation is ED, which is incorrect
- a. goal is to make patient briefly unconscious to do the painful procedure
 - b. a dislocated joint needs urgent sedation in ED

- c. fasting is indicated for procedural sedation in ED
 - d. NO preserves airway reflexes but can cause diffusion hypoxia
 - e. Blood gas co-efficient of NO is 0.47
- 14) Local anaesthetics, choose true and false
- a. Safe dose of lignocaine for a 65 kg male is 13ml of 2% solution
 - b. Safe dose of prilocaine for a 70kg male is 52ml of 1% solution
 - c. A 35kg child can have maximum of 3 ml of 2% bupivacaine
 - d. Adrenaline increases duration of action of LA
 - e. LA with adrenaline should never be used near end arteries
- 15) Local anaesthetics, which is false
- a. Cocaine and mepivacaine are ester local anaesthetics
 - b. Small diameter fibres are affected before larger ones
 - c. Myelinated fibres are affected before non-myelinated ones
 - d. Local penetration of LA is hindered by inflamed tissue due to drug being in ionized form
 - e. Esters are metabolized quicker than amides
- 16) Local anaesthetics, which is false
- a. LET can be used on open wounds
 - b. EMLA makes the veins more visible
 - c. Prilocaine causes methemoglobinemia
 - d. Cocaine is a Na channel blocker
 - e. Cocaine has vasodilatory properties
- 17) Which of the following least affects SpO₂
- a. MRI
 - b. False finger nails
 - c. Nail polish
 - d. Poor perfusion
 - e. Pt. movement
- 18) All of the following cause R shift of O₂-haemoglobin dissociation curve except
- a. Acidosis
 - b. 2,3,DGP
 - c. hyperthermia
 - d. hypercarbia
 - e. CO
- 19) Oxygen therapy
- a. NP 4L delivers ~ 40% oxygen
 - b. Oxygen consumption is 200ml/min
 - c. Spo₂ is a reliable predictor of successful intubation
 - d. Non-rebreating mask can deliver 100% O₂
 - e. Ability of Hudson mask to provide more oxygen concentration is hindered due to a smaller reservoir
- 20) Regarding ventilation, which of the following is incorrect
- a. PEEP should be set slightly higher than auto-PEEP to prevent gas trapping
 - b. PEEP improves oxygenation by decreasing distance between alveolar and capillary spaces

- c. NIV (BIPAP/CPAP) has shown to decrease the rate of intubation and mortality in type 1 resp failure patients
- d. There is a trend for smaller tidal volumes now, to prevent barotraumas
- e. Increasing the PEEP usually has no positive effect on ventilation

21) EtCo2

- a. Bronchospasm produces typical prolonged and slanting phase 2
- b. Phase 3 indicates alveolar plateau phase
- c. Pulmonary embolism causes decreased Etco2
- d. Progressive elevation of baseline indicate a rebreathing pattern
- e. Carbonated drinks can cause false + ve Etco2 tracing in esophageal intubation

22) Biers Block

- a. Dose of prilocaine is 6mg/kg 0.5% solution
- b. Children <10 yrs is a contra indication
- c. Biers block is safe in patients with sickle cell disease
- d. Cuff inflation time should be >20min to <1hr
- e. Lignocaine and prilocaine has similar safety profile so either can be used for biers block

Answers

- 1. B
- 2. C
- 3. B (low pressure doesn't help gas trapping)
- 4. D
- 5. C
- 6. Multiple
- 7. B
- 8. c
- 9. a
- 10. t,t,f,f,t
- 11. b
- 12. d
- 13. a
- 14. t,f,f,t,f
- 15. a
- 16. e
- 17. c
- 18. e
- 19. e
- 20. b
- 21. c
- 22. b

[Opioids for severe pain in ED patients](#)

Opioids for severe pain quiz

July 23, 2013

1. Question

Which one of the following is not an advantage of IV fentanyl over IV morphine?

- 1. It can be used more safely in renal failure
- 2. It is more rapid in onset
- 3. It has less haemodynamic effects
- 4. It has an active metabolite

4

Fentanyl can be used in renal failure due to its extensive hepatic metabolism. It has less haemodynamic effects than morphine and has a slightly more rapid onset than morphine. Unlike morphine, it does not have an active metabolite that can accumulate and cause toxicity with repeated administration. ([Link](#))

2. 2. Question

The most potent fentanyl derivate is:

- 1. Remifentanyl
- 2. Carfentanyl
- 3. Sufentanyl
- 4. Acetyl fentanyl

2

Carfentanyl is the most potent derivative – 30 times that of fentanyl. Sufentanyl is 15 X as potent, acetyl fentanyl is 5 X as potent and remifentanyl is only 2/3 the potency of fentanyl. ([Link](#))

3. 3. Question

Which of the following statements regarding the the presence of local redness or itching around the injection site following morphine administration is correct?

- 1. It is IgE mediated

- 2. It precludes further administration of morphine to that patient
- 3. It can be prevented by dilution of the morphine
- 4. It can be prevented by more rapid administration

3

Local redness or itching around injection site is due to direct histamine release and is not an IgE mediated anaphylactic or allergic reaction, so morphine can be given to the same patient again.

It can be prevented by dilution and slower administration. ([Link](#))

4. 4. Question

The correct initial dose of intranasal fentanyl for analgesia in children is:

- 1. 0.1 µg/kg
- 2. 0.5 µg/kg
- 3. 1.0 µg/kg
- 4. 1.5 µg/kg

4

The correct initial dose is 1.5 µg/kg, repeated 5 minutely to effect.

5. 5. Question

Which one of the following is a benefit of morphine over fentanyl?

- 1. Less histamine release
- 2. Shorter duration of action
- 3. Less likely to cause bradycardia
- 4. Less risk of muscular rigidity

4

Fentanyl is more likely to cause muscular rigidity and dystonia than morphine (although usually only at anaesthetic doses (15µg/kg)). Morphine is longer acting, more likely to cause histamine release or bradycardia. ([Link](#))

6. 6. Question

Which one of the following statements regarding pethidine is not correct?

- 1. It has a potentially severe adverse reaction in patients taking SSRIs

- 2. It causes more sedation than morphine
- 3. Is more likely to cause confusion in the elderly with repeated doses than morphine
- 4. It is more likely to cause bradycardia than morphine

4

Pethidine can cause a neuroleptic malignant type reaction in patients taking SSRIs or MAOIs.

It is more sedating than morphine and, due to its long acting metabolite norpethidine, is a potent cause of confusion in the elderly with repeated doses.

Unlike morphine, it usually increases heart rate a little due to a direct chronotropic action. [\(Link\)](#)

Muscle relaxants for intubation

1. Question

Which is the most rapidly reversed form of muscle relaxation?

- Letting suxamethonium wear off
- Reversing rocuronium with 3 ampoules of suggamadex
- Both of them

2

2. 2. Question

Which agent is the most likely to worsen hypoxia during RSI?

- Suxamethonium
- Vecuronium
- Rocuronium
- Atracurium

1

Suxamethonium is the most likely to cause hypoxia due to muscle fasciculation causing additional O₂ consumption

3. 3. Question

Which agent has the fewest adverse reactions?

- Rocuronium
- Suxamethonium

1

4. 4. Question

Which agent has the fewest contraindications?

- Rocuronium
- Suxamethonium

1

5. 5. Question

At suitable doses, which agent provides the most rapid muscle relaxation suitable for intubation?

- Rocuronium
- Vecuronium
- Suxamethonium
- Suxamethonium or rocuronium

4

6. 6. Question

Which agent is the easiest to tell clinically that muscle relaxation has occurred

- Suxamethonium
- Rocuronium
- Vecuronium
- Pancuronium

1

The end of suxamethonium induced fasciculations (in the small muscles (e.g. eyes), not just the big ones you can see!) indicates that paralysis has been obtained. This is the one advantage of suxamethonium over rocuronium, particularly in the patient with circulatory compromise and slower than normal onset of action. The adequacy of relaxation with the other agents is usually assessed by jaw muscle tone.

CHAPTER 2

Anesthesia/Analgesia

DIRECTIONS: Each question below contains five suggested responses. Select the one best response to each question.

20. All of the following statements regarding the use of TAC (tetracaine, adrenaline, cocaine) are true EXCEPT

- (A) it is most effective on well vascularized areas
- (B) it is contraindicated on mucosal surfaces
- (C) its adverse effects are mostly related to the adrenaline
- (D) multiple applications should be avoided
- (E) standard concentrations of cocaine are usually 11% or 5%

21. All of the following statements about conscious sedation in children are true EXCEPT

- (A) sedation with midazolam HCl alone would be appropriate for a CT scan
- (B) sedation with diazepam alone would be appropriate for an incision and drainage of a peritonsillar abscess
- (C) ketamine has both sedative and analgesic properties
- (D) infants younger than 3 months of age are more susceptible to respiratory depression from morphine
- (E) none of the above

22. A 20-year-old woman fell and sustained a 5-cm laceration over her right forearm. She states that she is extremely afraid of pain and had an allergic reaction manifested by severe rash after receiving procaine HCl from a dentist. What factor is important to consider when anesthetizing the wound?

- (A) Lidocaine or bupivacaine should be safe to administer
- (B) Injecting the anesthetic into the superficial dermis should be less painful than injecting it into the subdermal tissue
- (C) Lidocaine can be buffered with bicarbonate at a ration of 1:1 to reduce the pain of injection
- (D) Injecting the anesthetic through the cut edge of the wound should be less painful and should not disseminate bacteria through the wound
- (E) The maximum dose of lidocaine with epinephrine is 4.5 mg/kg

23. All of the following statements about midazolam are true EXCEPT

- (A) it may be given IV, PO, PR, IM, and intranasally
- (B) its duration of action is around 40 minutes
- (C) children require smaller mass/kg doses than do adults
- (D) children given midazolam are generally drowsy and disinhibited
- (E) none of the above

24. A 3-year-old, 17-kg boy fell into a window and sustained multiple lacerations to both hands. Which of the following is important to consider when treating his wounds?

- (A) The maximum dose of lidocaine without epinephrine is 7 mg/kg (119 mg = 11.9 ml of 1% lidocaine)
- (B) Most toxic reactions secondary to local anesthetics occur secondary to inadvertent intravenous injection
- (C) The earliest symptoms of lidocaine toxicity are respiratory cough, tachypnea, and respiratory alkalosis
- (D) Bupivacaine is safe in children over the age of 5
- (E) None of the above

25. Which of the following statements regarding digital block is correct?

- (A) One may safely use lidocaine with epinephrine for a digital nerve block
- (B) One may block the digital nerves at any point as they run up the finger
- (C) For adequate anesthesia of the thumb and small finger, only the volar branches must be blocked
- (D) A palmar approach is generally less painful
- (E) A compartment syndrome-like problem has never been documented from injection of too much volume of anesthesia

26. A 2-year-old child comes in with a first-time seizure and needs a CT scan and lumbar puncture. A good choice for sedation is

- (A) DPT (meperidine, promethazine, chlorpromazine) because it does not cause respiratory depression in children older than 1 year of age
- (B) chloral hydrate because it has rapid onset and offset
- (C) morphine, because its sedative effects occur at lower doses than required for analgesic effects
- (D) methohexital because it can be given per rectum and has quick onset
- (E) none of the above

Anaesthesia / Analgesia

| | | | | | | | |
|----|---|----|---|----|---|----|---|
| 20 | C | 21 | B | 22 | A | 23 | C |
| 24 | B | 25 | B | 26 | E | | |

- a. LMA
- b. Surgical cricothyroidotomy
- c. Contrast enhanced CT
- d. Awake fibre-optic intubation
- e. MRI
- f. BiPAP
- g. Needle cricothyroidotomy
- h. Immediate rapid sequence induction and intubation
- i. Refer to local dentist

For the following scenarios pick the most appropriate intervention from the listed options.

1. 7-year-old girl presents following a fall from her bicycle with headstrike. She was not wearing a helmet. Examination reveals a large scalp haematoma. Her GCS drops from 14 to 7. You are unable to intubate and cannot pass an LMA. Her oxygen sats are 85% and she is becoming more difficult to BVM.
2. A 66-year-old male presents with a 4-day history of worsening mouth pain and swelling after 'cracking a tooth'. He has been unable to eat for 2 days and is now finding it hard to take fluids due to pain and an inability to open his mouth. On examination, his temperature is 37.9, HR 110, RR 16, Sats 99% air. His mouth opening is around 2cm and he has an obvious L facial swelling. His voice is slightly hoarse.
3. You are in a tertiary hospital ED on a week day. You are handed over a 57-year-old type 2 diabetic with OSA and acute on chronic type 2 respiratory failure in the resus bay. He weighs roughly 180kg. He is on BiPAP @ 30/15 and his most recent ABG shows a pH of 7.25, pCO₂ 85, pO₂ 60. He is on 60% FiO₂ and his respiratory rate is 25 with TV of 250ml. His GCS has deteriorated to 13/15. CXR is impossible to read but bedside USS shows B-lines in the R lower lung field.
4. You are called to a code blue on a medical ward. A 65-year-old who was transferred 3 hours prior from ED after presenting with chest pain is in cardiac arrest. The nursing staff are applying the defibrillator and adequate chest compressions are underway. You notice the anaesthetic registrar is having difficulty achieving adequate chest rise with a BVM.
5. Ambulance calls through a 15-year-old male involved in an MVA within 1km of your hospital. They have scooped and ran. He was an unrestrained passenger sustaining severe facial and injuries. GCS 9/15, HR 140, RR 18, Sats 88% on 15L NRB. He has extensive upper and lower facial injury. His lower jaw has been crushed and is partially obstructing his pharynx. Blood is pouring from his face further obstructing his airway when lying supine.

Answers

1. g (APLS 2011 5th ed – children <12 needle cricothyroidotomy; children > 12 needle or surgical cricothyroidotomy – expert consensus only)
2.
c (<http://onlinelibrary.wiley.com/enhanced/doi/10.1111/17426723.12266/#Survey>)
3. D
4. a
5. b

- a. Fentanyl
- b. Propofol
- c. Suxamethonium
- d. Rocuronium
- e. Cisatracurium
- f. Dantrolene
- g. Midazolam
- h. Bupivocaine
- i. Ropivocaine
- j. Lignocaine
- k. Prilocaine
- l. 20% lipid emulsion therapy

For the following scenarios pick the most appropriate medication from the listed options.

1. You are called to a METCALL in theatres of a small rural hospital in New Zealand. A 25 year-old male of Maori decent is undergoing a washout of a hand wound by the orthopaedic team. A GP anaesthetist is attending and the consultant anaesthetist is out of town. He is being ventilated spontaneously with an LMA. He has become tachycardic (160), hypercapneic (ETCO₂ 55) and tachypneic (30). He is not responding to usual measures including adequate analgesia. VBG shows a HAGMA.
2. As part of a large trauma team, you decide to intubate a 35 year-old male semi-electively for pain and pre-operative management of a macerated R upper limb, which was caught in a mixing machine. He is on a propofol infusion for ongoing sedation. The nurse comes to you to tell you he is fighting the ventilator and is tearing. He needs to go to CT and theatre within the next 30 minutes.
3. A are asked to assist in an the semi-elective intubation of a burns patient who has presented to the ED 48hours after 10% BSA lower limb burns due to a delay in finding him after an explosion on a rural property. He has been without food or water for this entire period of time. He has developed multi-organ failure, has made no urine in the 6 hours in ED and is mounting a significant SIRS response. You are asked to draw up a muscle relaxant.
4. A 55 year old female is undergoing a Bier's block for reduction of a Colles #. She is accidentally given bupivocaine and when the cuff is released rapidly develops a seizure and unresponsive to usual treatment and has been ongoing for 10 minutes. Her temperature is 38.
5. Maximum dose 2mg/kg or 3mg/kg with adrenaline.

Answers

1. f

2. a

3. e

4. l

5. e

Anesthesia and Analgesia

Each question below contains five suggested responses. Select the ONE BEST response to each question.

02-16 Which of the following agents is LEAST likely to cause hypotension at standard doses?

- (A) Morphine
- (B) Meperidine
- (C) Fentanyl
- (D) Midazolam
- (E) Propofol

[Show Answer](#)

02-17 Which of the following agents may cause truncal and jaw muscle rigidity?

- (A) Morphine
- (B) Meperidine
- (C) Ketamine
- (D) Fentanyl
- (E) Etomidate

[Show Answer](#)

02-18 Which of the following agents may precipitate bronchospasm in patients with reactive airway disease?

- (A) Midazolam
- (B) Etomidate
- (C) Ketamine
- (D) Propofol
- (E) Methohexital

[Show Answer](#)

02-19 Which of the following statements regarding local anesthetics is FALSE?

- (A) Lidocaine and bupivacaine are both amide anesthetics
- (B) Warming and buffering has been shown to reduce the pain of injection
- (C) The duration of anesthesia is twice as long with bupivacaine as with lidocaine
- (D) Duration of anesthesia is prolonged with epinephrine
- (E) Epinephrine can damage local tissue defenses

[Show Answer](#)

02-20 EMLA is appropriate for all of the following procedures EXCEPT

- (A) venipuncture
- (B) laceration repair
- (C) lumbar puncture
- (D) myringotomy
- (E) cautery of genital warts

[Show Answer](#)

02-21 Which of the following statements regarding toxicity of local anesthetics is FALSE?

- (A) The first signs of toxicity are dizziness, tinnitus, periorbital tingling, and nystagmus
- (B) Systemic convulsions are rare and usually self-limited
- (C) Most allergic reactions are to aminoamide compounds
- (D) For patients allergic to local anesthetics, diphenhydramine hydrochloride 1 percent can be injected into the wound
- (E) To prevent toxicity, avoid rapid injections of local anesthetic into the wound

[Show Answer](#)

02-22 Which of the following statements about digital nerve blocks is FALSE?

- (A) Digital nerve blocks are more efficacious than metacarpal blocks
- (B) A 27-gauge needle is inserted through the skin into each side of the extensor tendon, just proximal to the web
- (C) The needle is advanced toward the palm until its tip is palpable beneath the volar surface of the finger
- (D) It is not necessary to anesthetize the dorsum of the involved digit
- (E) The total volume of anesthetic agent should not exceed 4 mL

[Show Answer](#)

02-23 A 32-year-old male presents with a laceration he sustained after stepping on broken glass at the beach. The examination reveals an 8-cm cut on the medial plantar aspect of the left foot. Which peripheral nerve block is appropriate?

- (A) Saphenous nerve
- (B) Sural nerve
- (C) Posterior tibial nerve
- (D) Superficial peroneal nerve
- (E) Deep peroneal nerve

[Show Answer](#)

02-24 A 20-year-old male kick boxer sustains a lower lip laceration during a practice match. The wound is complex and crosses the vermilion border. Which is the best way to achieve anesthesia?

- (A) Local infiltration with 1 percent lidocaine
- (B) Local infiltration with 1 percent lidocaine with epinephrine
- (C) Inferior alveolar nerve block
- (D) Lingular nerve block
- (E) Mental nerve block

[Show Answer](#)

[Show Results](#)

[Show All Answers](#)

(16) The answer is C

Fentanyl is a potent, synthetic opioid. Because it does not trigger histamine release like other opioid analgesics, it causes little hemodynamic compromise. All the other agents listed cause dose-dependent hypotension.

(Chapter 33)

(17) The answer is D

Truncal and jaw muscle rigidity are rare side effects of fentanyl that can lead to impaired ventilation. This rigidity most often occurs at high doses (>10-15 µg/kg) and may be reversed by parenteral naloxone. If naloxone is unsuccessful, paralysis and endotracheal intubation may be necessary.

(Chapter 33)

(18) The answer is E

Methohexital is an ultra-short-acting barbiturate that provides sedation and amnesia for short, invasive procedures. Barbiturate administration may precipitate bronchospasm in patients with moderate to severe reactive airway disease, thus limiting its use in those patients. There is some evidence that ketamine may have a mild, transient bronchodilatory effect. Midazolam, etomidate, and propofol have no clinically significant effect on bronchial smooth muscle tone. Of the listed agents, only ketamine provides analgesia in addition to sedation.

(Chapter 15)

(19) The answer is C

The duration of anesthesia after bupivacaine is nearly four times longer than that for lidocaine. With either agent, the duration of action is prolonged when combined with epinephrine. However, the local vasoconstrictive action of epinephrine may result in local hypoxia that impairs white blood cell function, thereby damaging local tissue defenses. Both lidocaine and bupivacaine are amide anesthetics.

(Chapter 32)

(20) The answer is B

EMLA (eutectic mixture of local anesthetics) is a eutectic mixture of 5 percent lidocaine and prilocaine that is used to produce anesthesia over intact skin. In the ED, its primary use is to produce anesthesia before

venipuncture and lumbar puncture. In other settings, this cream has been used for anesthesia of split-thickness graft donor sites, curettage of molluscum contagiosum, cautery of genital warts, and myringotomy. EMLA is not recommended for topical anesthesia of lacerations because it induces an exaggerated inflammatory response, thereby damaging host defenses and inviting the development of infection.

(Chapter 32)

(21) The answer is C

Slow injections limit the chance for local anesthetic toxicity. When history of allergy is uncertain, an antihistamine such as diphenhydramine injected directly into the wound can be used as an alternative and achieves anesthesia in approximately 30 min. True allergic reactions to local anesthetics are rare, especially to aminoamide compounds such as lidocaine and bupivacaine. The ester derivatives of para-aminobenzoic acid, such as procaine, are responsible for most local anesthetic allergic reactions. Toxicity should be suspected in patients who complain of dizziness, tinnitus, and periorbital tingling. Rarely, systemic convulsions follow. These are usually self-limited because of rapid redistribution of the drug, with resultant lower serum levels.

(Chapter 32)

(22) The answer is D

The dorsal branch of the digital nerve supplies the dorsal aspect of each digit and should be included in the digital block. Digital nerve blocks are less time consuming and more efficacious than metacarpal blocks.

(Chapter 32)

(23) The answer is C

The posterior tibial nerve innervates the sole of the foot. To perform a peroneal nerve block, 1 percent lidocaine is injected into the subcutaneous tissue lateral to the posterior tibial artery at the upper border of the medial malleolus. None of the other nerves listed supply the plantar surface of the foot. The saphenous nerve provides sensation to the skin over the medial malleolus. The sural nerve supplies the lateral foot and fifth toe. The superficial peroneal nerve innervates the dorsum of the foot and the other toes, except the adjacent sides of the first and second toes, which derive sensation from the deep peroneal nerve.

(Chapter 32)

(24) The answer is E

A regional block is preferred for a complex lower lip laceration because it preserves tissue planes and landmarks, facilitating anatomically correct repair. The mental nerve supplies the skin and mucous membranes of the lower lip. The mental foramen is located inside the lower lip at its junction with the lower gum, just posterior to the first premolar tooth. To avoid nerve injury, 1 percent lidocaine with epinephrine is injected close to, but not into, the mental foramen. The inferior alveolar and lingular nerves do not supply the lower lip and thus would not be effective in this patient.

(Chapter 32)