HKCA PART II MCQ PREPARATION

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MBCHB FRCA

HKCA

- Introduced SBA and MCQ March 2018
- To test the breadth and depth of knowledge
- Measures the candidates' understanding of a clinical problem rather than ability to memorize large numbers of facts.
- MCQs from the Royal College of Anaesthetists (UK)
- Exam takes place in the evening (UK daytime)

EXAM SYLLABUS

- **Essential Units**
- Anaesthesia for neurosurgery, neuroradiology and neurocritical care
- Cardiothoracic anaesthesia and cardiothoracic critical care
- General duties
  - Airway management
  - Critical incidents
  - Day surgery
  - General, urological and gynaecological surgery
  - Head, neck, maxillo-facial and dental surgery
  - Management of respiratory and cardiac arrest
  - Non-theatre
  - Orthopaedic surgery
  - Perioperative medicine*
  - Regional
  - Sedation
  - Transfer medicine
  - Trauma and stabilisation
- Intensive care medicine
- Obstetrics
- Paediatric
- Pain medicine

EXAM SYLLABUS

- **Optional Units**
- Ophthalmic
- Plastics/Burns
- Vascular surgery
- **Advanced Sciences to underpin Anaesthetic Practice**
- Anatomy
- Applied clinical pharmacology
- Applied physiology and biochemistry
- Nutrition
- Physics and clinical measurement
- Statistical basis for trial management

MCQS

- **90** questions in 3 hours
- **60 Multiple True-False (MTF):**
- 20 Advanced sciences to underpin anaesthetic practise
- 20 General duties (essential units)
- 17 Specialist (essential units)
- 3 Optional units
- **30 Single Best Answer (SBA):**
- 15 General duties (essential units)
- 15 Specialist (essential units)/Optional Units

WHAT IS SBA?

- Single best answers – 30 questions
- Used to be 20 x clinical anaesthesia, 5 x intensive care questions and 5 x pain management
- **30 Single Best Answer (SBA):**
- 15 x General duties (essential units)
- 15 x Specialist (essential units)/Optional Units
- 5 options
- 4 marks each
- No negative marking
- Pass mark - around 70% (21 out of 30)

HOW TO REVISE SBAS AND MCQS?

- FRCA is an UK exam!!
- FRCA – basic and intermediate training curriculum (Found at RCoA wedsite)
- British guidelines – NICE guidelines, RCOA guidelines, AAGBI guidelines, BTS guidelines, DAS guidelines, OAA guidelines.
- Life support – ALS guidelines, ATLS guidelines, APLS/EPLS guidelines
- UK national audit projects.
- NELA – National Emergency Laparotomy audit – executive summaries
- RISK scoring systems
- Never events lists – NHS Improvement
- BJA education journals, Anaesthesia review articles and Anaesthesia tutorial of the week.
- More ethical, decision making questions. Beware of those questions in view of cultural difference.
- Drugs which are not commonly used in HK
  - Sugammadex
  - Diamorphine (use in spinal)
  - Metaraminol
  - Glycopyrolate is much preferred to atropine to prevent bradycardia (longer acting, doesn't cross the BBB)

NATIONAL AUDIT PROJECTS

- NAP1
  - Supervisory Role of Consultant Anaesthetists
- NAP 2
  - Place of mortality and morbidity review meetings
- NAP 3
  - Major complications of central neuraxial block in the United Kingdom
- NAP4
  - Major complications of airway management in the United Kingdom
- NAP5
  - Acidental awareness during general anaesthesia in the United Kingdom
- NAP6
  - Perioperative anaphylaxis

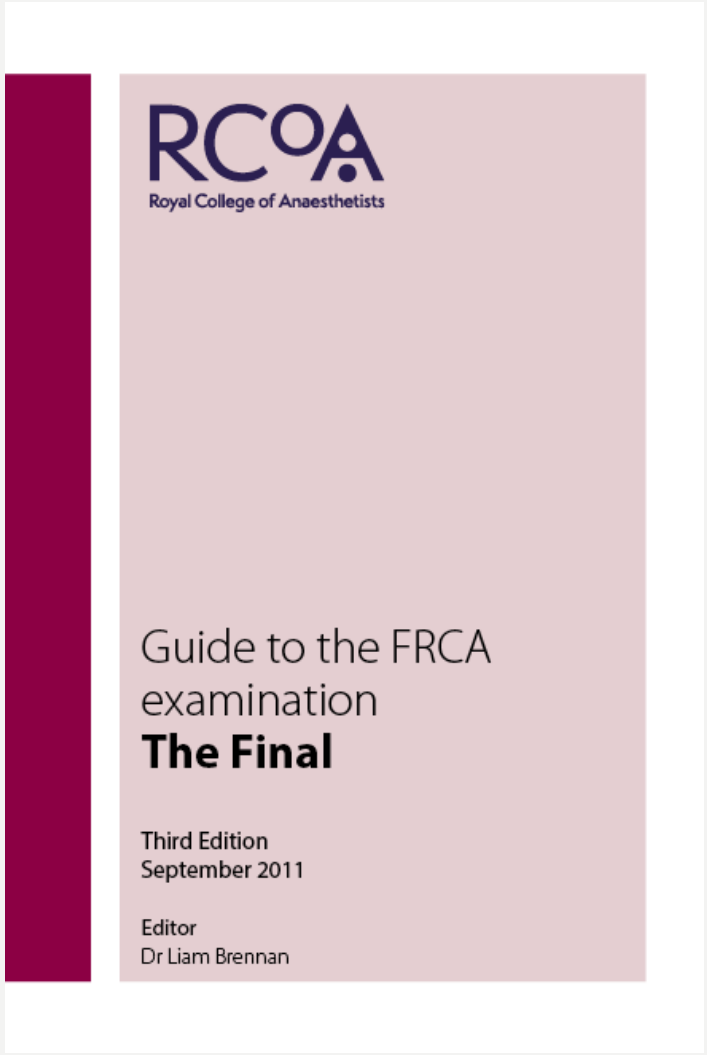
NEVER EVENTS

- **Surgical**
- 1. Wrong site surgery
- 2. Wrong implant/prosthesis
- 3. Retained foreign object post procedure
- **Medication**
- 4. Mis-selection of a strong potassium solution
- 5. Administration of medication by the wrong route
- 6. Overdose of insulin due to abbreviations or incorrect device
- 7. Overdose of methotrexate for non-cancer treatment
- 8. Mis-selection of high strength midazolam during conscious sedation
- **Mental health**
- 9. Failure to install functional collapsible shower or curtain rails
- **General**
- 10. Falls from poorly restricted windows
- 11. Chest or neck entrapment in bed rails
- 12. Transfusion or transplantation of ABO-incompatible blood components or organs
- 13. Misplaced naso- or oro-gastric tubes
- 14. Scalding of patients
- 15. Unintentional connection of a patient requiring oxygen to an air flowmeter
- 16. Undetected oesophageal intubation

WEBSITE

- RCoA
  - https://www.rcoa.ac.uk/resources-candidates/the-final-candidate-resources
- Anaesthesia UK
  - http://www.frca.co.uk/default.aspx

BOOKS


RCoA
Royal College of Anaesthetists
Guide to the FRCA examination
The Final
Third Edition
September 2011
Editor
Dr Liam Brennan

COURSES

- No written courses in Hong Kong
- In house MCQ workshop
- All in UK – However, all courses include SAQs components
- PROS
  - Question banks
  - Techniques
  - Mock exam in exam conditions
- CONS
  - Very far away!!
  - Not designed to improve your knowledge – You have to hit the books before you go!!

EXAMPLES OF SBAS

1. An 84 year old lady with advanced dementia is admitted with a fractured neck of femur. A Do Not Attempt Cardiopulmonary Resuscitation (DNACPR) order is in place. After discussion with her family, it is agreed that the fracture should be fixed for pain relief. You proceed with a spinal anaesthetic and a single dose of 1mg midazolam. Just after positioning her for surgery, you notice she has stopped breathing and you cannot feel her carotid pulse. The most appropriate action now is:

- A Administer boluses of flumazenil and adrenaline
- B Ask a senior colleague for a second opinion
- C Commence cardiopulmonary resuscitation
- D Respect the DNACPR order
- E Telephone the relatives and determine their wishes.

1. An 84 year old lady with advanced dementia is admitted with a fractured neck of femur. A Do Not Attempt Cardiopulmonary Resuscitation (DNACPR) order is in place. After discussion with her family, it is agreed that the fracture should be fixed for pain relief. You proceed with a spinal anaesthetic and a single dose of 1mg midazolam. Just after positioning her for surgery, you notice she has stopped breathing and you cannot feel her carotid pulse. The most appropriate action now is:

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- D Respect the DNACPR order
- E Telephone the relatives and determine their wishes.

Answer: C

Rationale:

As the patient is in cardiorespiratory arrest, prompt action is required. Although it would be appropriate to seek senior advice (response B), this will inevitably delay matters and would not be the very first priority. Response E is also excluded on this basis. The AAGBI guidelines suggest suspending DNACPR orders during surgery, which therefore makes response D less likely to be the correct course of action. Administering flumazenil and adrenaline (response A) may be considered given the recent benzodiazepine administration, but are less likely to be effective if the patient is in cardiac arrest. Commencing cardiopulmonary resuscitation is the single best answer of the five available choices.

2. You are asked to review a 22 year old man in the recovery area following a tonsillectomy. He was anaesthetised by a colleague and is now awake and comfortable but complains that his upper right incisor tooth has been broken off during the procedure.

Which of the following should take priority:

- A Apologise to the patient and document this in the notes.
- B Arrange an urgent chest x-ray to identify the location of the tooth
- C Complete an incident form and inform your clinical director
- D Ensure the colleague who anaesthetised the patient is informed.
- E Examine the patient to assess damage and possible location of the tooth.

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- E Examine the patient to assess damage and possible location of the tooth.

Answer: E

It is important that an apology is made to the patient and the incident documented. Similarly it will be good practice to inform your colleague who anaesthetised the patient of the problem. However, there is concern that the tooth is apparently missing and possibly in the patient's airway. On this basis, responses A, C and D can be excluded. A chest x-ray would be important if the tooth could not be located. Given the patient is apparently comfortable in recovery, it would be most appropriate to examine him first and assess the possible location of the tooth before exposing him to a dose of radiation. Answer E is therefore the single best response of the five available choices.

Dental Trauma During Anaesthesia

Managing Avulsion (tooth out of socket)

Act immediately!

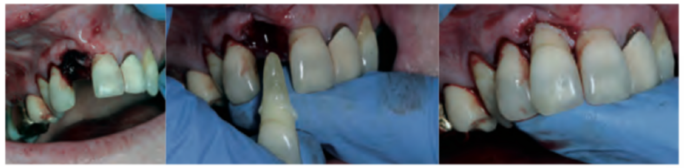
Should the tooth be replaced?

Only replace an adult tooth from a healthy mouth in a patient who is not immunocompromised

DO NOT touch root surfaces

Push into socket and hold for several minutes

If you do not feel comfortable replacing the tooth, store in saline or milk



Refer for splinting using locally agreed form

Managing Damage

A tooth is chipped or broken

Locate loose fragments

Give any loose fragments to the patient

Refer using locally agreed form

3. A 33 year old woman with severe depression is detained in hospital under Section 3 of the Mental Health Act 1983. She agrees to a trial of electroconvulsive therapy (ECT). However, at your preoperative visit, she appears anxious and says she has changed her mind and no longer wants the procedure.

The best course of action would be:

- A Advise psychiatry team that as consent has been withdrawn ECT cannot take place
- B Continue with treatment as she cannot refuse under Section 3 of the Mental Health Act
- C Give her an information leaflet on ECT and review her again in 30 minutes
- D Phone the Trust Legal Department for advice
- E Prescribe temazepam 10mg as anxiolysis

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Answer: A

- This question is based on the UK Mental Health Act 1983/ Mental Capacity Act 2005
- Section 2 - admit to hospital for assessment up to 28 days.
- Section 3 – admit to hospital for treatment up to 6 months
- Capacity - Those over 16 have the legal capacity to consent to a medical procedure if they are able to understand, retain, use and weigh the relevant information, and communicate their decision
- Treatment cannot be refused under section 3, apart from ECT. If the patient refuses to consent to ECT and the treating team believe it to in the patient's best interests, an assessment by a Second Opinion Appointed Doctor (SOAD) is required

Clinical anaesthesia SBA Questions

1. A patient becomes severely hypotensive after induction of anaesthesia with propofol, fentanyl and succinylcholine. The patient has been resuscitated and anaphylaxis is suspected.

Which is the most informative test in the first hour following resuscitation?

- A. Urinary methylhistamine
- B. Plasma histamine
- C. Serum mast cell tryptase
- D. Specific IgE for succinylcholine
- E. Total plasma IgE

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ANSWER = C

THE ASSOCIATION OF ANAESTHETISTS

of Great Britain & Ireland

Management of a Patient with Suspected Anaphylaxis During Anaesthesia SAFETY DRILL

(Revised 2009)

2. An 84 year-old woman scheduled to undergo surgery for a fractured neck of femur develops atrial fibrillation at a rate of 140 beats/minute following induction of general anaesthesia. Her blood pressure is 60/40 mmHg and there is no improvement following a rapid transfusion of 500 ml of colloid.

What would be the most appropriate next intervention ?

- A. Incremental doses of adenosine
- B. Bolus dose of amiodarone over 30 mins
- C. Intravenous infusion of esmolol
- D. DC cardioversion
- E. Intravenous infusion of magnesium

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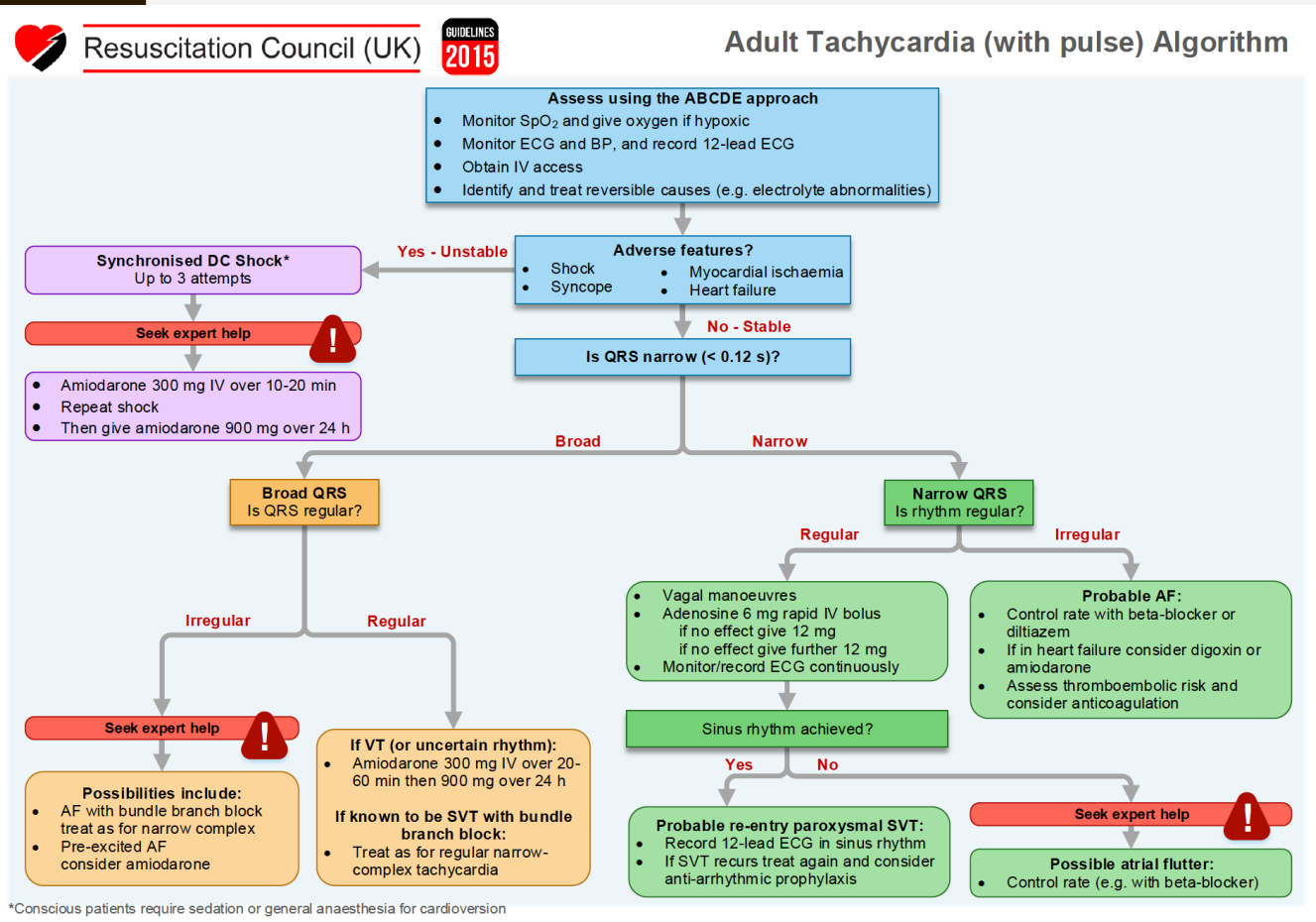
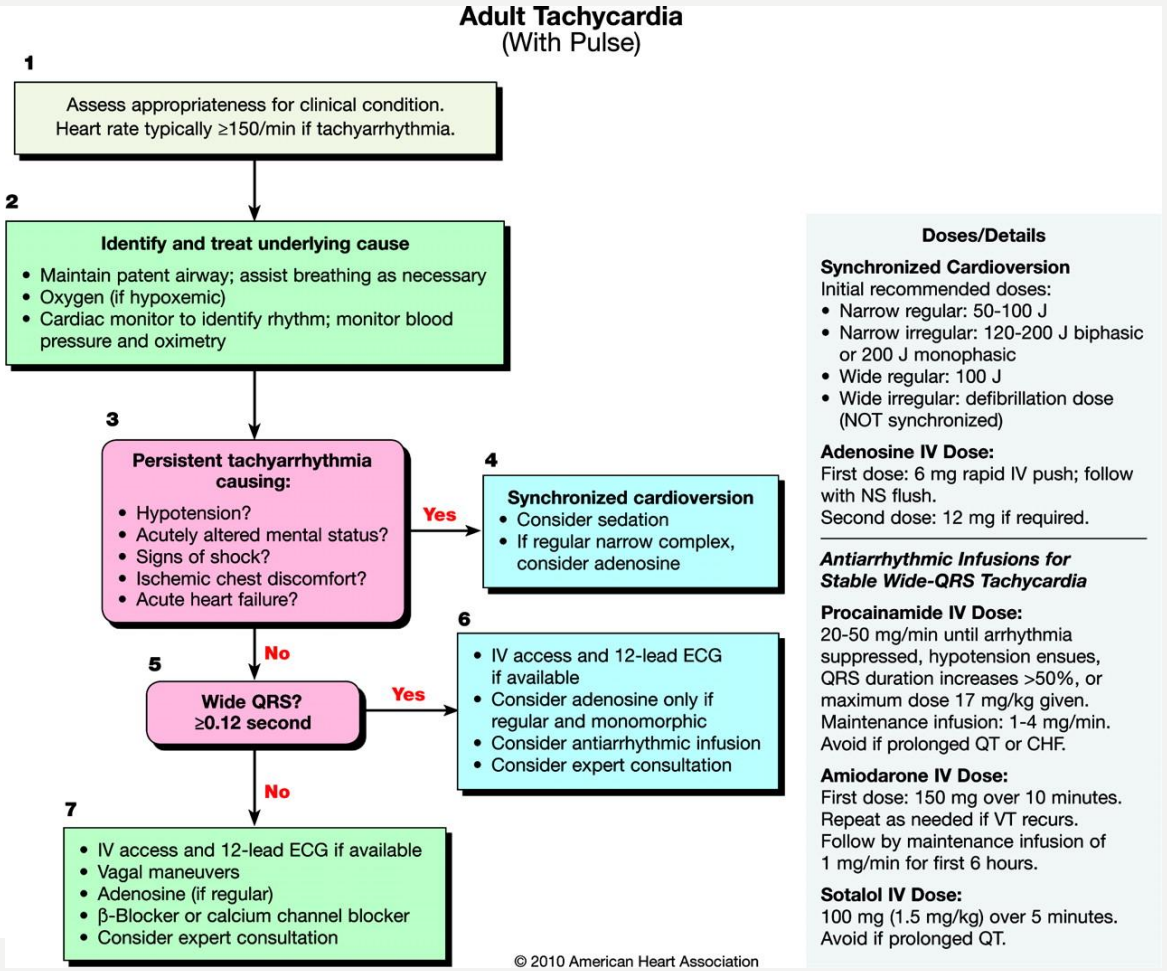
ANSWER = D

ALS VS ACLS


Resuscitation Council (UK)
GUIDELINES 2015
Adult Tachycardia (with pulse) Algorithm
Assess using the ABCDE approach
Monitor SpO2 and give oxygen if hypoxic
Monitor ECG and BP, and record 12-lead ECG
Obtain IV access
Identify and treat reversible causes (e.g. electrolyte abnormalities)
Adverse features?
Shock
Syncope
Myocardial ischaemia
Heart failure
Yes - Unstable
Synchronised DC Shock*
Up to 3 attempts
Seek expert help
Amiodarone 300 mg IV over 10-20 min
Repeat shock
Then give amiodarone 900 mg over 24 h
No - Stable
Is QRS narrow (< 0.12 s)?
Broad
Narrow
Broad QRS
Is QRS regular?
Irregular
Regular
Seek expert help
Possibilities include:
AF with bundle branch block treat as for narrow complex
Pre-excited AF consider amiodarone
If VT (or uncertain rhythm):
Amiodarone 300 mg IV over 20-60 min then 900 mg over 24 h
If known to be SVT with bundle branch block:
Treat as for regular narrow-complex tachycardia
Narrow QRS
Is rhythm regular?
Regular
Irregular
Vagal manoeuvres
Adenosine 6 mg rapid IV bolus
if no effect give 12 mg
if no effect give further 12 mg
Monitor/record ECG continuously
Probable AF:
Control rate with beta-blocker or diltiazem
If in heart failure consider digoxin or amiodarone
Assess thromboembolic risk and consider anticoagulation
Sinus rhythm achieved?
Yes
No
Probable re-entry paroxysmal SVT:
Record 12-lead ECG in sinus rhythm
If SVT recurs treat again and consider anti-arrhythmic prophylaxis
Seek expert help
Possible atrial flutter:
Control rate (e.g. with beta-blocker)
*Conscious patients require sedation or general anaesthesia for cardioversion


Adult Tachycardia
(With Pulse)
1
Assess appropriateness for clinical condition.
Heart rate typically ≥150/min if tachyarrhythmia.
2
Identify and treat underlying cause
Maintain patent airway; assist breathing as necessary
Oxygen (if hypoxemic)
Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
3
Persistent tachyarrhythmia causing:
Hypotension?
Acutely altered mental status?
Signs of shock?
Ischemic chest discomfort?
Acute heart failure?
Yes
4
Synchronized cardioversion
Consider sedation
If regular narrow complex, consider adenosine
No
5
Wide QRS?
≥0.12 second
Yes
6
IV access and 12-lead ECG if available
Consider adenosine only if regular and monomorphic
Consider antiarrhythmic infusion
Consider expert consultation
No
7
IV access and 12-lead ECG if available
Vagal maneuvers
Adenosine (if regular)
β-Blocker or calcium channel blocker
Consider expert consultation
© 2010 American Heart Association
Doses/Details
Synchronized Cardioversion
Initial recommended doses:
Narrow regular: 50-100 J
Narrow irregular: 120-200 J biphasic or 200 J monophasic
Wide regular: 100 J
Wide irregular: defibrillation dose (NOT synchronized)
Adenosine IV Dose:
First dose: 6 mg rapid IV push; follow with NS flush.
Second dose: 12 mg if required.
Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia
Procainamide IV Dose:
20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.
Amiodarone IV Dose:
First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.
Sotalol IV Dose:
100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

ALS

Synchronised cardioversion

If the patient is conscious, carry out cardioversion under sedation or general anaesthesia, administered by a healthcare professional competent in the technique being used. Ensure that the defibrillator is set to synchronised mode.

- For a broad-complex tachycardia or atrial fibrillation, start with 120–150 J and increase in increments if this fails.
- Atrial flutter and regular narrow-complex tachycardia will often be terminated by lower energies: start with 70–120 J.

3. A10 year-old girl with Down's syndrome presents for adenotonsillectomy. Her family are refugees and have recently arrived in the UK from Somalia. She has recurrent respiratory infections and tires easily when playing. On examination SpO2 is 93% in air, aural temperature 37.2°C and she has a non-radiating grade 3/6 systolic murmur.

What is the most appropriate management of this case?

- A. Reassure parents that this is probably an innocent flow murmur and surgery may proceed today
- B. Defer the case pending a full cardiological assessment including an echocardiogram
- C. Ask the paediatric StR to examine the patient and proceed if they think the murmur is innocent
- D. Proceed with the case but ensure that the patient receives antibiotic endocarditis prophylaxis
- E. Measure her BP and obtain a 12-lead ECG and proceed with surgery if these are both normal

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ANSWER = B

- StR
  - Specialist training Registrar (normally referring to year 3 or above trainee)
- Foundation Year 1 doctor (Houseman)
- Foundation Year 2 doctor (Fully registered)

Routine preoperative tests for elective surgery

NICE guideline

Published: 5 April 2016

nice.org.uk/guidance/ng45

1.9 Echocardiography

1.9.1 Do not routinely offer resting echocardiography before surgery.

1.9.2 Consider resting echocardiography if the person has:

- a heart murmur **and** any cardiac symptom (including breathlessness, pre-syncope, syncope or chest pain) **or**
- signs or symptoms of heart failure.

Before ordering the resting echocardiogram, carry out a resting electrocardiogram (ECG) and discuss the findings with an anaesthetist.

4. A 70 year-old man with abdominal pain and vomiting for three days is listed for urgent laparotomy. He is a known hypertensive and diet-controlled diabetic. Pulse rate is 110 beats per minute, blood pressure 105/60 mmHg and he has generalised limb weakness.

Investigations: haemoglobin 180 g/L, potassium 2.2 mmol/L, urea 20 mmol/L, creatinine 95 micromols/L, blood glucose 12 mmol/L

What is the most appropriate initial intervention?

- A. Infuse a litre of 0.9% sodium chloride solution containing 20 mmols of potassium chloride over one hour via a peripheral line
- B. Insert central venous and direct arterial monitoring lines
- C. Infuse a litre of Hartmann's solution over 30 minutes via a peripheral line
- D. Infuse a litre 0.9% sodium chloride solution over 30 minutes via a peripheral line
- E. Commence patient on a sliding scale insulin regimen to maintain glycaemic control

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ANSWER = A

5. A 50 year-old man with Crohn's disease requires an urgent laparotomy for small bowel obstruction. He has a body mass index (BMI) of 24kg/m2 and his airway assessment is normal. However, at previous laparotomy, he was noted to be a grade 2 to grade 3 intubation.

What is the most appropriate anaesthetic management for this patient?

- A. Perform a rapid sequence induction with propofol and rocuronium
- B. Inhalational induction with sevoflurane prior to laryngoscopy
- C. Perform a spinal anaesthetic aiming for a sensory level of T6
- D. Awake fibreoptic intubation before induction of general anaesthesia
- E. Perform a rapid sequence induction with propofol and succinylcholine

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- D. Awake fibreoptic intubation before induction of general anaesthesia
- E. Perform a rapid sequence induction with propofol and succinylcholine

ANSWER = E

Rationale: The RCoA insists suxamethonium provides the best intubation condition when RSI is indicated.

6. A previously fit 78 year-old man has a transurethral resection of the prostate (TURP) performed under general anaesthesia taking 90 minutes to complete. Half an hour after arrival in the recovery room he has not regained consciousness. Respiratory effort is adequate and vital signs are stable.

Which of the following deranged investigations is most likely to account for his current clinical condition?

- A. Haemoglobin 7.1 g/dl
- B. Serum sodium 114 mmol/L
- C. Serum glucose 2.8 mmol/L
- D. PaO_2 8.9 kPa (FiO_2 = 0.35)
- E. $PaCO_2$ 7.4 kPa

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ANSWER = B

EXAMPLES OF MCQS T/F

1. Following elective reversal of colostomy in a 58 year old man with a BMI of 40, post-operative use of continuous positive airways pressure (CPAP) of 5cm H2O:

- A is expected to reduce the incidence of respiratory complications
- B should be considered if the patient has CPAP treated obstructive sleep apnoea
- C should be planned if patient has a STOP BANG score of 5
- D will be unnecessary if the patient has a STOP BANG score of 3
- E is contraindicated as subsequent aerophagia will lead to anastomotic breakdown

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Answer: TTTFF

Rationale:
A STOP BANG score of 3 or more is associated with a high risk of OSA and CPAP should be considered. CPAP is safe after bowel resection and has not been shown to be associated with anastomotic breakdown, even in bariatric surgery.

2. A 28 year old female presents for laparoscopic sterilisation as a day case. She has a history of narcolepsy with cataplexy. Currently she is well controlled on modafinil 200mg twice daily, venlafaxine 37.5mg once daily and sodium oxybate 7.5mg in 2 divided doses at night.

The following are appropriate ways of managing her medication perioperatively:

- A All the drugs should be withheld on the day of surgery
- B Sodium oxybate should be withheld on the night before surgery
- C Modafinil should be continued on the day of surgery
- D Venlafaxine should be discontinued throughout the perioperative period
- E Consider withholding sodium oxybarate on the night after surgery

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- E Consider withholding sodium oxybarate on the night after surgery

Answer: FFFFT

Rationale:
Stopping venlafaxine risks provoking status catalepticus and so should be continued. Sodium oxybate is the sodium salt of gamma hydroxybutyric acid (GHB). It is used clinically as a sedative and has a very short duration of action, hence the two doses at night. It was previously used as an intravenous anaesthetic. Potentially there could be residual effects from drugs used during the anaesthetic which could potentiate the effects of sodium oxybate on the night after surgery. Modafinil is a stimulant and could be safely stopped, although some studies have shown that it improves recovery after general anaesthesia in patients who have not previously taken the drug.

3. A 55 year old man has just completed a 100 mile ultramarathon. He felt light headed for the last 10 miles and collapsed at the finishing line. His pulse rate is 120 per minute, BP 90/50, capillary refill time 4 seconds. Urea and electrolytes: Na 130 mmol.l-1, K 3.2 mmol.l-1, Cl 103 mmol.l-1, Urea 15 mmol.l-1, Creatinine 130 micromol.l-1, Plasma osmolality 273 mOsmol.l-1, urine osmolality 380 mOsmol.l-1, Urinary Na < 20 mmol.l-1.

Which of these terms best describe his hyponatraemia?

- A hypotonic hypovolaemic
- B hypotonic euvolaemic
- C hypotonic euvolaemic
- D isotonic pseudohyponatraemia
- E hypertonic dilutional

3. A 55 year old man has just completed a 100 mile ultramarathon. He felt light headed for the last 10 miles and collapsed at the finishing line. His pulse rate is 120 per minute, BP 90/50, capillary refill time 4 seconds. Urea and electrolytes: Na 130 mmol.l-1, K 3.2 mmol.l-1, Cl 103 mmol.l-1, Urea 15 mmol.l-1, Creatinine 130 micromol.l-1, Plasma osmolality 273 mOsmol.l-1, urine osmolality 380 mOsmol.l-1, Urinary Na < 20 mmol.l-1.

Which of these terms best describe his hyponatraemia?

- A hypotonic hypovolaemic
- B hypotonic euvolaemic
- C hypotonic euvolaemic
- D isotonic pseudohyponatraemia
- E hypertonic dilutional

Answer: TFFFF

Rationale:
The clinical picture is typical of hypotonic hypovolaemic hyponatraemia. Urine osmolality is high and urinary sodium low as a result of the normal physiological response to dehydration and sodium losses from sweating. The patient will require water and sodium replacement until euvolaemic. Hypotonic euvolaemic hyponatraemia is seen in SIADH whereas hypotonic hypervolaemic hyponatraemia would be more typical of cirrhosis or heart failure. Pseudohyponatraemia is seen in hyperlipidaemic states and a hypertonic dilutional hyponatraemia can occur with severe hyperglycaemia or following the use of glycine or mannitol.

4. A previously healthy 25 year old primiparous woman has a normal vaginal delivery in the midwife–led delivery suite. Soon afterwards she is found collapsed from a suspected amniotic fluid embolism. Her blood pressure is 55/30.

Which of the following are likely to contribute to her hypotension:

- A Decreased venous return due to pulmonary vasospasm
- B Development of disseminated intravascular coagulopathy
- C Development of septic shock
- D Development of pre-eclampsia
- E Feto–maternal transfer of Rhesus antigens

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Answer: TTTFT

Rationale:
All of the above can occur but the immediate cause of hypotension is the reduced venous return to the left atrium secondary to pulmonary vasospasm.

5. A 5 year old boy with cerebral palsy requires a tibialis anterior tendon transfer under general anaesthesia as a day case. His parents agree with your suggestion that a regional anaesthetic technique will enhance his post-operative analgesia.

The following regional anaesthetic techniques would be appropriate in this case:

- A Ankle block with 0.25% bupivacaine
- B Caudal block with bupivacaine and clonidine
- C Popliteal fossa and saphenous nerve block
- D Sciatic and femoral nerve block
- E Spinal with bupivacaine and fentanyl

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Answer: FFTFF

Rationale: A caudal or spinal block would be bilateral and make mobilisation awkward. Mobilisation may also be difficult with combined sciatic and femoral nerve blocks. An ankle block might not cover all the operative area.

SUMMARY

- **FRCA** is a fair and structural exam.
- **Preparation** – It takes about a year to prepare for the exam. There is no short cut!!
- **Practice** – Lots of practice to master the technique.
- **Luck** - You always need a bit of luck in the exam.
- Next sitting is on the 10th – 11th Sept 2018
- MCQ workshop – 20th /21st April 2018

GOOD LUCK!!