Self-assessment

This section is designed to test your knowledge of selected topics in this issue of the journal. The correct answers are given at the foot of the page.

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MULTIPLE CHOICE QUESTIONS

1 Physiology of ageing

Which of the following respiratory parameters decline with increasing age?

A. ☐ Forced expiratory volume in 1 second (FEV_1)
B. ☐ Functional residual capacity (FRC)
C. ☐ Closing capacity
D. ☐ Residual volume
E. ☐ Lung diffusion capacity

2 General anaesthesia for ophthalmic surgery

Which of the following are true about the oculo-cardiac reflex?

A. ☐ It is a trigemino-vagal reflex
B. ☐ Atropine may be given as prophylaxis to reduce the incidence of the reflex
C. ☐ Incidence of the reflex increases with increasing age
D. ☐ Hypercarbia can make the reflex more severe
E. ☐ Local anaesthetic does not affect the transmission of this reflex

3 Regional anaesthesia for eye surgery

Which of the following are true regarding the performance of sub-Tenon block?

A. ☐ This block uses a blunt needle and thus avoids the blind placement of sharp needles
B. ☐ Does not provide anaesthesia for vitreoretinal surgery
C. ☐ Performed in the inferonasal quadrant of the eye
D. ☐ A slight proptosis at the end of the block indicates a successful block
E. ☐ Absence of akinesia indicates an ineffective block

4 Perioperative anaphylaxis

Which of the following are true regarding the causes, presentation and management of perioperative anaphylaxis ?

A. ☐ Bronchospasm is the most common presenting feature
B. ☐ Most common triggers of anaphylaxis are neuromuscular blocking agents
C. ☐ Test doses of antibiotics should be administered in an attempt to reduce the severity of anaphylaxis
D. ☐ The NAP6 report suggests CPR when systolic BP is less than 50 mmHg during perioperative anaphylaxis
E. ☐ Consider administration of antibiotics prior to anaesthesia if possible as this allows earlier detection of symptoms

SINGLE BEST ANSWER

5 An 80-year-old male is posted for an elective inguinal hernia repair under general anaesthesia. He has no past medical history. Which of the following is true regarding the anaesthetic implications for this surgery?

A. ☐ The duration of inhalational induction is usually quicker when compared to intravenous induction
B. ☐ Spinal anaesthesia for this procedure has a protective effect in preventing postoperative cognitive dysfunction when compared to general anaesthesia
C. ☐ This patient should be admitted to the critical care unit postoperatively
D. ☐ The duration of action of non-depolarising muscle relaxants like (cis-)atracurium is prolonged
E. ☐ This patient is at high risk of developing post-operative delirium

6 A 30-year-old female is posted for emergency laparoscopic appendicectomy. She has a BMI of 46. She is a professional singer and she has no medical problems. Her airway is graded as Mallampati 3 and she has protruding upper incisors. Which of the following may be discussed as risks and management of anaesthesia?

A. ☐ Inform the patient about the risks of anaesthesia in agreement with an esteemed body of medical opinion
B. ☐ The risk of dental damage is approximately 1 in 10,000 cases
C. ☐ The estimated frequency of sore throat after anaesthesia is 20% where an endotracheal tube is used
D. ☐ There is evidence of reduced rate of airway trauma and sore throat following tracheal intubation with videolaryngoscopy compared to conventional laryngoscopy
E. ☐ The risk of injury to the posterior laryngeal structures is more common with a supraglottic airway than endotracheal tube

ANSWERS

1. Correct answers: A, E

2. Correct answers: A, B, D

3. Correct answers: A, C, D

4. Correct answers: D, E

5. Correct answer: E. Prolonged arm-brain circulation time delays onset of anaesthesia when using intravenous induction agents, but in theory increases the speed of onset of a gas induction. In reality, however, the duration of inhalational induction is usually prolonged due to the reduced alveolar diffusion and the increased *V/Q* mismatch that occurs with advancing age. Postoperative delirium (POD) occurs in over 20% of those aged over 65, usually develops in the first few postoperative days, and is usually temporary. It has a fluctuating course, with abnormal circadian rhythm, inattention, disorientation and memory deficit. POD may be sub-classified as hyperactive, hypoactive (which carries a higher mortality), or mixed variation. POD is independently associated with increased mortality, increased length of hospital stay, functional disability and discharge to long-term care institutions. Risk factors for the development of POD include type of surgery (high risk groups include cardiac surgery, emergency surgery and following hip fracture) and patient-specific factors: increasing age, pre-existing cognitive dysfunction, lower educational attainment, previous stroke.

The cause of postoperative cognitive dysfunction (POCD) is unknown, and several hypotheses exist. Risk factors for the development of POCD are the same as those of POD, with cardiac surgery carrying the greatest risk. Whilst it is tempting to think that avoidance of general anaesthesia may prevent POCD, studies have failed to show that spinal anaesthesia has any protective effect when compared to general anaesthesia.

Hepatic clearance of many anaesthetic drugs is reduced. For example, aminosteroid neuromuscular blocking agents may have a prolonged duration of action, mandating routine neuromuscular monitoring. In contrast, the duration of action of (cis-)atracurium is unaffected by age as it is independent of hepatic metabolism.

In broad terms, the rate of adverse postoperative outcomes increases with physiological age, comorbidity and frailty. These postoperative complications are predominantly medical rather than surgical. Outcomes are considerably worse if surgery is unplanned and mortality and morbidity for the 'big three' surgical emergencies of older people (ruptured abdominal aortic aneurysm, laparotomy and hip fracture) is relatively static, despite improvements in outcome following similar procedures carried out electively. Historically, fewer elderly patients have been admitted to a critical care ward postoperatively than would have been predicted on the basis of type of surgery or illness severity criteria. Postoperatively, all patients with a predicted mortality of $>$10% should be admitted to a critical care ward, though there remains significant inter-hospital variability in the UK.

6. Correct answer: D. The Montgomery ruling in the UK Supreme Court highlights the need for clinicians to better tailor discussions of potential complications to the individual patient with whom they consult. We can no longer rely on the Bolam test (whether an esteemed body of medical opinion would uphold a decision) when weighing-up which information to share in the consenting process; clinicians must include information about any and all risks which their patients could consider material to informing their choices when consenting for medical investigations and treatments. The aim of this review is to describe the potential respiratory system complications of anaesthesia, illustrate how these can be mitigated and, where possible, provide quantitative information regarding the risk of occurrence as a reference for clinicians.

Cuts or bruising to the lips or tongue occurs in approximately 5% of anaesthetics; however, it is likely that there is significant under-reporting of such events. The risk of damage to a tooth is approximately 1:4500 cases.

The estimated frequency of sore throat after anaesthesia is 20% where a supraglottic airway (SGA) is used, increasing to 40% with a cuffed tracheal tube (TT). Insertion of gastric tubes, temperature probes, suction apparatus, and devices such as oesophageal Doppler or transoesophageal echo probes also risk trauma. In most cases symptoms are mild and short-lived, but they may prove a source of complaint or litigation in the context of extended severity and chronicity, or where the patient uses their voice professionally.

Clumsy laryngoscopy, especially with curved blades and stylets, can cause pharyngeal injury or perforation. Forces applied during laryngoscopy are reduced by use of videolaryngoscopy; a 2016 Cochrane review demonstrates a reduced rate of airway trauma and sore throat when videolaryngoscopy is used.

The vocal cords and posterior laryngeal structures may be injured in up to 1% of intubations, affecting mostly young, healthy patients during routine uncomplicated intubation and accounting for around one-third of airway trauma claims against anaesthetists. Injuries include laryngeal granuloma, nerve palsy, arytenoid dislocation and fracture; subglottic stenoses and granulomata are more rare. Harm may be temporary or permanent and may interfere with speech, swallowing and occasionally with breathing. Injury to the posterior laryngeal components from an SGA is less common than intubation-related injury. Use of excessively large tubes or inflation of a cuff across the laryngeal inlet are prime causes of injury. Solutions include avoiding intubation where it is not indicated, using videolaryngoscopy where possible to avoid blind (bougie) techniques, selecting smaller TTs and optimally managing and monitoring cuff pressure and position during use.