Ultrasound-guided lumbar central neuraxial block

1. Of the five basic ultrasonographic views, the neuraxial structures of the spine can be identified in the:
   (a). Transverse interlaminar view.
   (b). Parasagittal articular process view.
   (c). Parasagittal transverse process view.
   (d). Parasagittal oblique view.
   (e). Transverse spinous process view.

2. When performing a preprocedural lumbar neuraxial ultrasound, it is important to:
   (a). Estimate the approximate depth of the posterior complex by measuring the length of the spinous process in the transverse spinous process view.
   (b). Start with the transverse interlaminar (TI) view in order to identify intervertebral spaces that allow the identification of the posterior complex.
   (c). Determine each lumbar intervertebral space in the parasagittal oblique (PSO) view.
   (d). Position the patient in the sitting position.
   (e). Use a low-frequency, curved-array probe.

3. With regard to the current available evidence:
   (a). Lumbar vertebral levels determined by surface anatomical landmarks are often lower than when determined using neuraxial ultrasound.
   (b). There is poor correlation between ultrasound-measured depth and actual needle insertion depth when using a PSO view.
   (c). Neuraxial ultrasound can facilitate central neuraxial block (CNB) in patients with lumbar scoliosis.
   (d). There is no improvement in the clinical efficacy of obstetric epidural analgesia when using ultrasound compared with surface landmark-guided techniques.
   (e). Neuraxial ultrasound can reduce the number of needle punctures and needle redirections required for successful CNB.

4. The following statements with regard to the practice of neuraxial ultrasound are true:
   (a). An estimated experience of 80 scans may be required for competency.
   (b). After having acquired competency, neuraxial ultrasound should only be used in patients in whom technical difficulty is anticipated.
   (c). Self-directed learning and online interactive scanning models replace the need for expert-led hands-on workshops.
   (d). Ultrasound-assisted central neuraxial block replaces the traditional landmark-guided approach.
   (e). Neuraxial ultrasound requires an in-depth knowledge of the anatomy of the spine.

Ventricular arrhythmias and sudden cardiac death

1. A 68-year-old man is on the coronary care unit 48 h after an acute, inferior myocardial infarction (MI). He has an ejection fraction of 35% on transthoracic echocardiography and develops ventricular tachycardia with preserved blood pressure. The following would be appropriate first-line therapy anti-arrhythmic drug(s):
   (a). Metoprolol.
   (b). Verapamil.
   (c). Amiodarone.
   (d). Flecainide.
   (e). Mexiletine.

2. Regarding implantable cardioverter defibrillators (ICDs):
   (a). They eliminate the need for anti-arrhythmic drugs.
   (b). They improve quality of life but do not affect long-term survival.
   (c). They must be implanted under general anaesthesia.
   (d). Their insertion is indicated in a patient greater than 4 weeks after MI with an ejection fraction of less than 35% and a wide QRS complex on ECG.
   (e). They are completely deactivated by a magnet.
3. Regarding a patient with a broad complex tachycardia, the following suggest a diagnosis of ventricular tachycardia (VT) rather than supraventricular tachycardia with bundle branch block:

(a). The presence of structural heart disease.
(b). Atrioventricular (AV) dissociation.
(c). Cannon waves of the jugular venous pulse.
(d). Any RS wave less than 100 ms in duration.
(e). Capture beats.

4. Regarding broad complex tachycardia:

(a). Intravenous verapamil is extremely useful in differentiating the likely source.
(b). Brugada syndrome is an example of a long QT syndrome.
(c). In cardiogenic shock, amiodarone is first-line therapy, administered peripherally if necessary.
(d). Magnesium therapy is only useful to treat torsades de pointes.
(e). VT may be completely cured by electrophysiological catheter ablation.

**Anaesthetic considerations for patients with neurosurgical implants**

1. Concerning neurosurgical implants, incidental surgery and anaesthesia:

(a). 1. Electroconvulsive therapy (ECT) is considered unsafe in patients with a deep brain stimulator (DBS).
(b). 2. The use of ultrasound close to implantable electrical devices (IEDs) is considered unsafe.
(c). 3. Central neuraxial block is contraindicated in patients with spinal cord stimulators.
(d). 4. Laparoscopic surgery can safely be performed in patients with ventriculoperitoneal shunts.
(e). 5. Postoperative admission to intensive care or high dependency is recommended in patients with neurosurgical implants to allow neurological observation.

2. When managing a patient with a cerebrospinal fluid (CSF) diversion device (shunt):

(a). A full neurological examination detailing preoperative and postoperative motor sensory deficit will aid in diagnosing a blocked shunt.
(b). All operative procedures, irrespective of the specialty, should be performed in a neurosurgical centre.
(c). Pneumocephalus is a common cause of central nervous system (CNS) deterioration after laparoscopic surgery.
(d). Slow awakening in the recovery room is often due to a blocked device and hydrocephalus.
(e). Computed tomography (CT) of the head should be performed to assess baseline shunt function and the degree of hydrocephalus.

3. With regard to failure of neurosurgical implants:

(a). Acute failure of an intrathecal baclofen pump device can safely be managed with oral baclofen replacement.
(b). Suspected thrombosis of an intracranial stent should be referred to the neurosurgical centre.
(c). Failure is more likely to occur in IEDs with biphasic than monophasic defibrillation in the event of cardiac arrest.
(d). A large pleural effusion on the side of a ventriculopleural shunt indicates a failed shunt and should be aspirated before surgery.
(e). The management of the patient with a device that has failed should be discussed during the World Health Organization (WHO) preoperative team brief.

4. In patients with implanted neurostimulator devices:

(a). Thermal injury to the brain or spinal cord can occur when diathermy is used.
(b). Monopolar diathermy is recommended.
(c). The device may be mistaken for a cardiac pacemaker in the unconscious patient.
(d). Unintended reprogramming may arise from electrical interference, but will be of little consequence.
(e). Peripheral nerve block is inappropriate.
Substance abuse in anaesthetists

1. Concerning addiction in general:
   (a). Six percent of doctors will develop substance dependency problems at some stage in their life.
   (b). Addiction is recognized as a chronic disease.
   (c). Anaesthetists as a specialty are over-represented in treatment centres in the USA.
   (d). Withdrawal symptoms on cessation of intake of a drug are a required hallmark symptom in order for a diagnosis of addiction to be made.
   (e). Codeine causes a less severe form of addiction than a major opioid such as fentanyl or heroin.

2. Regarding addiction in anaesthetists:
   (a). Opioid potency correlates well with the rate of onset of addiction.
   (b). Propofol is the drug of choice in 20% of addicted anaesthetics trainees.
   (c). Tighter controls on fentanyl have reduced the incidence of addiction among anaesthetists.
   (d). Behavioural changes are the most common presenting features of an addictive illness.
   (e). Experimentation with drugs before entering anaesthesia training is a known risk factor in the development of addiction.

3. Concerning risk factors for substance abuse and relapse:
   (a). Alcoholism in first-degree relatives puts an individual at increased risk of developing an addiction.
   (b). Recent efforts to increase knowledge and awareness of addiction in anaesthetists have resulted in a reduced incidence of relapse.
   (c). Those with a family history of substance abuse are afforded some protection against relapse.
   (d). A history of anxiety and depression is a common cause of addiction.
   (e). Relapses involve taking the initial drug of choice in fewer than 30% of cases.

4. In regard to the recovery period:
   (a). Substance abuse results in automatic suspension of registration by the General Medical Council (GMC).
   (b). Insight and the taking of remedial steps are regarded as important by regulatory bodies.
   (c). Addiction to cocaine is associated with a particularly poor outcome.
   (d). Hair and urine testing are equally reliable in the detection of drug abuse.
   (e). Persistent denial and failure to commit to recovery are poor prognostic features.

Dexmedetomidine: its use in intensive care medicine and anaesthesia

1. A 25-year-old man is undergoing artificial lung ventilation on the intensive care unit, having been admitted with pneumonia. His serum triglyceride concentration is 12 mmol litre$^{-1}$ (normal range <2 mmol litre$^{-1}$). He is expected to progress to a trial of tracheal extubation within the next few days.
   (a). Dexmedetomidine would be an appropriate sedative choice.
   (b). If considered appropriate, dexmedetomidine should be commenced with an intravenous loading infusion of 1 µg kg$^{-1}$ followed by an infusion at a rate of 0.6 µg kg$^{-1}$ h$^{-1}$.
   (c). If dexmedetomidine is started, it should be stopped before tracheal extubation.
   (d). Dexmedetomidine is contraindicated if his condition worsens and he requires neuromuscular block to facilitate lung ventilation.
   (e). His risk of haemodynamic compromise is higher with dexmedetomidine than with propofol.

2. A 50-year-old patient with severe liver failure attributable to excess alcohol consumption is admitted to the intensive care unit with an infective exacerbation of chronic obstructive pulmonary disease (COPD). A ceiling of-treatment decision is made, precluding invasive lung ventilation. A trial of non-invasive ventilation of the lungs is suggested, but he will not tolerate this without sedation.
   (a). Dexmedetomidine may be a useful sedative in this patient.
Multiple Choice Questions

(b). The dose of dexmedetomidine given by infusion should be reduced.
(c). Second-degree heart block is a contraindication to the administration of dexmedetomidine.
(d). Dexmedetomidine may give this patient a dry mouth.
(e). Acute agitation during non-invasive ventilation should prompt administration of a bolus of dexmedetomidine in this patient.

3. A 28-year-old lady is having an awake craniotomy with dexmedetomidine used as a sole sedative agent.
   (a). Hypertension may be seen during administration of the loading dose.
   (b). Apnoea is commonly seen when very high doses are used.
   (c). Dexmedetomidine has a terminal elimination half-life of 8 h.
   (d). Cerebral blood flow and metabolic rate will be increased.
   (e). The patient is more likely to complain of a dry mouth when using this sedative agent.

4. Concerning dexmedetomidine:
   (a). Its use is contraindicated in renal failure.
   (b). It has marketing authorization for use as a sedative for cataract extraction in the UK.
   (c). It may cause adrenal suppression at therapeutic doses.
   (d). Has a bioavailability of 65% when given intranasally at a dose of 1 µg kg⁻¹ for paediatric sedative premedication.
   (e). It increases central noradrenergic activity.

Anaesthetic implications of performance-enhancing drugs

1. Abuse of anabolic steroids can lead to:
   (a). An alteration of secondary sexual characteristics.
   (b). Cardiovascular changes.
   (c). Tendon rupture.
   (d). Polycythaemia.
   (e). Renal failure.

2. Drugs that are believed to increase oxygen delivery to the tissues include:
   (a). Xenon.
   (b). β-Blockers.
   (c). Steroids.
   (d). Cobalt.
   (e). Perfluorocarbons.

3. Drugs are often used to mask performance-enhancing drug (PED) use. These include drugs such as:
   (a). Narcotics.
   (b). Diuretics.
   (c). Human growth hormone.
   (d). Secretion inhibitors.
   (e). Epitestosterone.

4. Amateur PED use is associated with the abuse of other drugs, such as:
   (a). Amphetamines.
   (b). Cannabinoids.
   (c). Oral contraceptive pills (OCPs).
   (d). Caffeine.
   (e). Lansoprazole.