

1. While inserting a large bore intravenous cannula in the antecubital fossa, What is responsible for this?
 - a) Contact with the median nerve
 - b) Contact with the radial nerve
 - c) Contact with the ulnar nerve
 - d) Contact with the lateral cutaneous nerve of the forearm
 - e) Contact with the anterior interosseus nerve of the forearm

2. Radial nerve:
 - a) Receives contributions from all roots
 - b) Is medial to the biceps tendon at the elbow
 - c) Is outside the perivascular sheath in the axilla
 - d) Is cephalad to the artery in the axilla

3. During a regional technique for a total knee arthroplasty, which nerves do you need to block?
 - a) Popliteal, sciatic and femoral
 - b) femoral and lateral cutaneous of the thigh
 - c) transgluteal sciatic and obturator
 - d) transgluteal sciatic and lumbar plexus
 - e) psoas compartment and saphenous nerve block

4. For total anesthesia of the thigh, all of the following nerves must be blocked except
 - a) iliohypogastric
 - b) sciatic
 - c) femoral
 - d) lateral femoral cutaneous nerve of the thigh
 - e) obturator

5. What is the anatomy of the posterior spinal arteries? Except question?
 - a) they are branches of the aorta off the radicular arteries
 - b) form from the union of the cerebral arteries
 - c) are branches of the vertebral arteries
 - d) form from posterior cerebellar arteries

6. Landmark for T7 vertebrae in sitting position:
 - a) Angle of Louis.
 - b) Iliac crest.
 - c) Superior border of scapula.
 - d) Spines of scapula.

7. Which of the following statements regarding the axillary approach to the brachial plexus is/are TRUE?
 - a) It carries the least chance of pneumothorax.
 - b) The musculocutaneous nerve is easily anesthetized.

- c) Septa within the sheath may limit the spread of local anesthetic.
 - d) Injection at multiple sites in the axilla is not recommended because the axillary artery may be punctured.
8. For shoulder surgery, what dermatomes have to be blocked?
- a) C3-C6 and T1 to T2.
 - b) C3 to C7.
 - c) C5 to C8.
 - d) C3 to C8 and T1 to T2.
 - e) C5 to C8 and T1 To T2
9. When dissecting the antecubital fossa, which is not exposed after retracting the muscle layers?
- a) Median nerve.
 - b) Radial nerve.
 - c) Tendon of the biceps.
 - d) Anconeus muscle.
 - e) Brachial artery.
10. Regarding the median nerve at the wrist:
- a) Lies between the flexor carpi ulnaris and palmaris longus tendons.
 - b) Superficial to the retinaculum.
 - c) A paresthesia should be elicited to ensure adequate blockade.
 - d) Supplies all of the muscles of the thenar eminence.
 - e) Blockade causes complete anesthesia of the second and third fingers.
11. Local anesthetic deposited between the palmaris longus and flexor carpi radialis tendons at the wrist blocks which nerve?
- a) Median.
 - b) Radial.
 - c) Ulnar.
 - d) Medial antebrachial cutaneous.
 - e) Lateral antebrachial cutaneous.
 - f) Musculocutaneous
12. Which nerve originates from the sacral plexus?
- a) Posterior femoral cutaneous nerve.
 - b) Genitofemoral.
 - c) Obturator.
 - d) Lateral femoral cutaneous.
 - e) Saphenous
13. A needle is inserted between the trachea and sternocleidomastoid on to the transverse process of C6. What structure is the tip of the needle closest to?
- a) Cervicothoracic ganglia (did not say the stellate ganglion).

- b) Superior laryngeal nerve.
 - c) Phrenic nerve.
 - d) Recurrent laryngeal nerve.
 - e) Sympathetic chain.
14. A needle inserted at the level of C6, between the vertebral body and carotid, will be closest to what structure?
- a) recurrent laryngeal nerve
 - b) cervical thoracic ganglion
 - c) middle cervical ganglion
 - d) superior laryngeal nerve
 - e) phrenic nerve
15. A needle inserted at the C6 level lateral to the larynx and medial to the sternocleidomastoid will come closest to
- a) Superior cervical ganglion.
 - b) Phrenic nerve.
 - c) Cervicothoracic ganglion.
 - d) Superior laryngeal nerve
16. Which of the following is NOT an attachment of the dura?
- a) Foramen magnum.
 - b) Ligamentum flavum.
 - c) Filum terminale.
 - d) Spinal nerve epineurium.
 - e) Denticulate ligaments.
17. The lateral cutaneous nerve of the thigh originates from:
- a) L2-3
 - b) L3-4
 - c) L4-5
 - d) L5-S1
18. Which of the following statements regarding an ankle block is/are TRUE?
- a) Three main peripheral nerves need to be blocked.
 - b) The deep peroneal nerve is located in the deep plane of the anterior tibial artery.
 - c) The sural nerve is the major sensory nerve to the sole of the foot.
 - d) The deep peroneal nerve may be located by palpating the tendon of the extensor hallucis longus.
19. 72 year old female with IDDM and CAD is to undergo debridement of an ulcer on her right great toe. An ankle block is planned. Which nerves must be adequately blocked in order to perform the surgery?
- a) Deep peroneal, posterior tibial, saphenous, sural
 - b) Deep peroneal, saphenous, superficial peroneal, sural

- c) Deep peroneal, posterior tibial, superficial peroneal, sural
 - d) Deep peroneal, posterior tibial, saphenous, superficial peroneal
 - e) Deep peroneal, posterior tibial, saphenous
20. A 35 year old woman receives a sciatic nerve block for foot surgery. Which other nerve must be blocked in order to have complete anesthesia of the foot?
- a) Deep peroneal nerve
 - b) Superficial peroneal nerve
 - c) Sural nerve
 - d) Saphenous nerve
 - e) Posterior tibial nerve
21. Which of the following nerves blocked at the ankle do not contain motor fibers?
- a) Posterior tibial nerve
 - b) Saphenous nerve
 - c) Deep peroneal nerve
 - d) Sural nerve
22. Subcutaneous Injection of local anesthetic posterior to the lateral malleolus blocks which nerve?
- a) Posterior tibial.
 - b) Deep peroneal.
 - c) Superficial peroneal.
 - d) Sural.
 - e) Saphenous.
23. Injection of 3 mL of local anesthetic medial and deep to the dorsalis pedis artery and then lateral to it results in block of which nerve?
- a) Posterior tibial.
 - b) Deep peroneal.
 - c) Superficial peroneal.
 - d) Sural.
 - e) Saphenous.
24. Injection of 3 mL of local anesthetic medial to and under the dorsalis pedis artery followed by injection lateral to the DP artery blocks which nerve?
- a) Deep peroneal.
 - b) Superficial peroneal.
 - c) Posterior tibial.
 - d) Saphenous.
 - e) Sural.
25. What is the innervation of the fifth toe?
- a) Saphenous nerve.
 - b) Sural nerve.

- c) Tibial nerve.
 - d) Deep peroneal nerve.
 - e) Superficial peroneal nerve.
26. Which nerves should be blocked for surgery of the great toe?
- a) Tibial, saphenous, and deep peroneal.
 - b) Tibial, superficial peroneal, and deep peroneal.
 - c) Saphenous, superficial peroneal, and sural.
 - d) Sural, deep peroneal, and superficial peroneal.
27. What nerves are blocked by injection of local anesthetic on the dorsum of the foot at the dorsalis pedis pulse both medially and laterally to it in?
- a) Superficial peroneal.
 - b) Deep peroneal.
 - c) Posterior tibial.
 - d) Sural.
28. Which dermatome overlays the 5th toe?
- a) L4.
 - b) L5.
 - c) S1.
 - d) S2.
 - e) S3.
29. A man presents with laceration of the bottom of the foot under the 4th toe- where will you want to do the block?
- a) Lateral to the DP artery to the lateral malleolus
 - b) Behind the medial malleolus
 - c) Behind the lateral malleolus
 - d) Medial to the DP
 - e) From the vein over the medial malleolus to the DPA
30. You want to perform a regional block on a patient for surgery on their 1st and 2nd toes, dorsal and plantar. What nerves do you need to block?
- a) deep peroneal and saphenous
 - b) tibial and deep peroneal
 - c) tibial, deep peroneal, and superficial peroneal
 - d) tibial, deep peroneal, and saphenous
31. What innervates the webspace between the 1st and 2nd toes?
- a) Sural nerve
 - b) Saphenous nerve
 - c) Superficial peroneal nerve
 - d) Tibial nerve

- e) Deep peroneal nerve
32. Which nerve provides sensory innervation to the lateral aspect of the foot?
- superficial peroneal
 - deep peroneal
 - sural
 - posterior tibial
 - saphenous –medial aspects of lower legs
33. For a procedure on the foot and ankle, which of the following needs to be blocked in addition to a sciatic nerve block?
- sural
 - posterior tibial
 - anterior tibial
 - superficial peroneal
 - saphenous
34. All of the following are recommendations for the safe use of intravenous regional blocks, EXCEPT:
- use of upper arm rather than forearm for occluding tourniquet
 - inflating tourniquet to a pressure 2.5 times the systolic blood pressure
 - feeling for the radial pulse to confirm occlusion
 - must keep the cuff inflated for 40 minutes before attempting deflation
35. Which of the following is true re: IVRA?
- The tourniquet must be left inflated for at least 40 minutes
 - The maximum time of anesthesia is approximately 60 minutes
 - Once the tourniquet is deflated, duration of analgesia is minimal
 - Use of a double tourniquet decreases the risk of local anesthetic toxicity
 - Bupivacaine is the local anesthetic of choice
36. The most appropriate choice for IV regional in a 70 kg male:
- bupivacaine 0.25% 40 mL
 - lidocaine 0.25% 20 mL
 - prilocaine 1.5% 40 mL
 - bupivacaine 0.5% 20 mL
 - lidocaine 0.5% 40 mL
37. Regarding IV regional techniques, all are correct EXCEPT
- Lidocaine 0.5% 3mL/kg
 - Avoid deflating tourniquet for at least 20min following injection
 - Use preservative free lidocaine
 - Tourniquet should only be inflated to a maximum of 250 mmHg

38. Which of the following statements regarding intravenous regional anesthesia is/are TRUE?
- The tourniquet should be inflated to 300 mmHg or 2.5 times the patient's SBP.
 - lidocaine with epinephrine is the most commonly used anesthetic for this procedure.
 - if surgery is finished within 15 minutes, the tourniquet should be deflated and then re-inflated to delay the sudden re-absorption of anesthetic.
 - Bupivacaine is the local anesthetic of choice in a patient with lidocaine allergy.
39. Which of the following local anesthetics used for intravenous regional anesthesia is most rapidly metabolized and thus least toxic?
- Lidocaine
 - Ropivacaine
 - Mepivacaine
 - Prilocaine
 - Etidocaine
40. All of the following agents are acceptable for use in a Bier block EXCEPT:
- 0.5% lidocaine
 - 0.5% mepivacaine
 - 0.5% procaine
 - 0.5% prilocaine
 - 0.25% bupivacaine
41. Regarding brachial plexus block:
- Arm recovers before forearm
 - Musculocutaneous may escape freezing causing unblocked anteromedial forearm
 - 1.5 MV stimulation with Nerve stimulator means needle in sleeve
 - Intercostobrachial does not need to be blocked with interscalene
42. Successful wrist block abolishes which of the following:
- Wrist flexion
 - Wrist extension
 - Thumb flexion
 - Thumb extension
 - Finger adduction
43. Regarding the anatomy of the radial nerve which of the following are true?
- The radial nerve has a broad distribution and receives innervation from every ramus of the brachial plexus.
 - The radial nerve lies outside the nerve sheath in the axilla-no
 - The radial nerve lies cephalad to the vein in the axilla-lateral and caudad to
 - The radial nerve lies medial to the biceps tendon at the elbow-lateral
 - The radial nerve lies medial to the palmaris longus tendon at the wrist-see below
44. Median nerve blockade at the wrist:

- a) medial to flexor carpi radialis tendon
 - b) medial to palmaris longus
 - c) contact bone
 - d) infiltrate at lateral aspect of wrist
 - e) located at distal wrist crease
45. Brachial plexus anatomy. Which is correct?
- a) The subclavian vein is anterior to the middle scalene muscle
 - b) The subclavian artery is anterior to the brachial plexus
 - c) The brachial plexus is inferior to the first rib
 - d) The subclavian artery is posterior to the middle scalene muscle
 - e) The subclavian vein is posterior to the middle scalene muscle
46. Which of the following is TRUE about brachial plexus anatomy:
- a) Goes below the first rib-above
 - b) Subclavian vein is behind the anterior scalene-in front of
 - c) Subclavian artery is behind the anterior scalene-
 - d) Brachial plexus is behind the middle scalene
 - e) Subclavian artery is in front of the brachial plexus
47. Which is false in regards to brachial plexus anatomy?
- a) ulnar n arises from the medial cord
 - b) radial n has a broad distribution which arises from C5-T1
 - c) brachial plexus lies between the middle and anterior scalene
 - d) brachial plexus originates from the posterior rami of C4-T1
 - e) Musculocutaneous nerve innervates the biceps brachii
48. Which is true regarding the brachial plexus:
- a) anterior to subclavian artery
 - b) posterior to mid scalene muscle
 - c) composed of posterior rami-anterior
 - d) provides sensory innervation to shoulder joint
 - e) does not innervate latissimus dorsi
49. Which is true regarding brachial plexus blockade?
- a) proximal sensation returns before distal sensation
 - b) abduction of the arm after injection of local anesthetic will increase the spread of the block
 - c) nerve stimulation at 1.5 mA indicates intrasheath placement of the needle
 - d) there is no need to block the intercostobrachial nerve if using a tourniquet if an interscalene is used
50. Which is true regarding the brachial plexus?
- a) derived from the posterior rami of C5-8 and 1st thoracic nerve roots-no, anterior
 - b) supplies sensation to the shoulder joint

- c) posterior to the middle scalene
 - d) anterior to the subclavian artery
51. A patient with severe COPD requires elbow surgery of 2.5h in duration. The best regional technique would be?
- a) IV regional (Bier) block
 - b) Infraclavicular block
 - c) Supraclavicular block
 - d) Interscalene block
52. A patient with severe COPD is scheduled for fixation of an open fracture of the 2nd digit of the hand. Which anaesthetic technique is least desired?
- a) GA
 - b) axillary block
 - c) interscalene block
 - d) local anaesthetic infiltration
 - e) intravenous regional anaesthesia
53. Following regional anesthesia of the brachial plexus, which of the following is true regarding the test for adequacy of block?
- a) Block of the musculocutaneous nerve will result in inability to flex the elbow.
 - b) Inability to pronate the forearm is due to block of the radial nerve.
 - c) Block of the median nerve results in loss of sensation over the hypothenar eminence.
54. What is true about the structures surrounding the brachial plexus?
- a) The subclavian vein is anterior to the anterior scalene muscle.
 - b) The subclavian artery is posterior to the anterior scalene muscle.
 - c) The subclavian artery is anterior to the brachial plexus.
 - d) The nerves of the brachial plexus cross under the first rib.
55. Which ONE of the following is true regarding brachial plexus block?
- a) Arm should be abducted after injection to facilitate spread.
 - b) Sensation returns first to the arm then the hand.
 - c) Intercostobrachial
56. What nerve leaves the brachial plexus from the superior trunk before it divides into the anterior and posterior divisions?
- a) Long thoracic nerve.
 - b) Axillary nerve.
 - c) Musculocutaneous nerve.
 - d) Subscapular nerve.
 - e) Suprascapular nerve.
57. Which nerve leaves the superior trunk of the brachial plexus before it branches into the anterior and posterior division?

- a) Supraclavicular.
 - b) Suprascapular.
 - c) Subscapular.
 - d) Musculocutaneous.
 - e) Thoracodorsal.
58. Which nerve leaves the superior trunk of the brachial plexus before it bifurcates into anterior and posterior cords?
- a) Long thoracic.
 - b) Median.
 - c) Axillary.
 - d) Subscapular.
 - e) Suprascapular.
59. What is the nerve that comes off of the superior trunk before it separates into the divisions?
- a) Axillary.
 - b) Long thoracic.
 - c) Suprascapular.
 - d) Subscapular.
 - e) Musculocutaneous
60. What is true with respect to the nerves of the brachial plexus?
- a) Musculocutaneous causes elbow flexion.
 - b) Ulnar and median cause supination.
 - c) Radial causes wrist flexion.
 - d) Median nerve causes pronation
61. Which one of the following will occur in the upper extremity if unilateral transection of the dorsal (posterior) nerve roots between C5 and T2 occurs?
- a) Loss of shoulder adduction.
 - b) Loss of sensation over the acromion.
 - c) Loss of deep tendon reflexes in the wrist.
 - d) Sympathetic paralysis.
 - e) Paralysis of muscle controlling elbow movement.
62. What occurs when the posterior branches of C5 to T2 are cut?
- a) Loss of sensation over the acromion.
 - b) Loss of sympathetics.
 - c) Loss of ability to abduct the shoulder.
 - d) Loss of wrist reflex.
63. Which one of the following is true regarding regional anesthesia in the upper extremity?
- a) After brachial plexus block, the arm should be abducted to allow proximal spread.
 - b) Sensation returns first to the arm, then the hand.

c) The intercostal brachial nerve does not have to be blocked to prevent tourniquet pain in interscalene BPB.

d) A response to nerve stimulator set at 1.5 mA indicates intrasheath placement.

64. The musculocutaneous nerve:

a) Supplies the medial part of the forearm.

a) Exits at the interscalene groove.

b) Originates from the posterior division of the brachial plexus.

c) Can be blocked 5 cm proximal to the antecubital fossa.

65. Block of the musculocutaneous nerve is best accomplished at what level?

a) At the elbow lateral to the olecranon.

b) At the elbow lateral to the biceps tendon.

c) At the elbow medial to the brachial artery.

d) At the wrist lateral to the extensors of the thumb.

e) At the wrist in between the palmaris longus and flexor carpi radialis.

66. A musculocutaneous nerve block at the elbow is performed where?

a) Between the flexor carpi radialis and palmaris longus.

b) Medial to the brachial pulse.

c) Lateral to the olecranon.

d) Lateral to the biceps tendon.

67. The musculocutaneous nerve:

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d) Can be blocked 5 cm proximal to the antecubital fossa.

68. With respect to the neurologic exam following brachial plexus block, which is correct

a) Musculocutaneous nerve causes elbow flexion

b) Pronation is ulnar nerve

c) Supination is median

69. Deep cervical plexus block is performed

a) with the patient's head midline and extended

b) with the use of a nerve stimulator with a twitch of the omohyoid muscle at 0.4 mamp

c) most common complication is brain stem anaesthesia

d) performed with the needle directed in the cephalad direction

e) major complication is injection into the vertebral artery

70. With a deep cervical plexus block, all of the following are blocked but?

a) spinal accessory nerve

b) lesser occipital (C3)

c) transverse cervical nerve

- d) phrenic (C2-4)
 - e) greater auricular
71. Which of the following suggests a femoral neuropathy?
- a) weak hip flexion
 - b) weak ankle dorsiflexion
 - c) absence of a patellar reflex
 - d) numbness along anterolateral thigh
 - e) weak hip adduction
72. The most common mechanism of injury to the lateral cutaneous nerve of the thigh is:
- a) pressure on anterior superior iliac spine
 - b) pressure on tensor fascia lata
 - c) compression of fibula head
 - d) prolonged abduction of the leg
73. Ulnar neuropathy, all EXCEPT:
- a) Higher incidence in men than women
 - b) Increased incidence in cardiac surgery
 - c) Increased incidence with general anesthesia
 - d) Passes through cubital tunnel ventral to medial epicondyle
 - e) Increased incidence with increased body weight
74. Regarding complications of neural blockade :
- a) in the supraclavicular approach to the brachial plexus block, pneumothorax is more common than phrenic nerve block
 - b) phrenic nerve block is common with deep cervical plexus block-true
 - c) hypotension is not a common complication of celiac plexus blockade
 - d) phrenic nerve block is uncommon with an interscalene block-false
 - e) block at the ulnar groove at the elbow will not cause neuritis-false
75. Which of the following results in the highest levels of IV local anesthetics?
- a) intercostal block
 - b) sciatic/femoral block
 - c) epidural/caudal
 - d) subcutaneous injection
 - e) axillary block
76. All of the following are true regarding radial nerve injury, EXCEPT?
- a) Inability to adduct thumb.
 - b) Loss of metacarpal flexion.
 - c) Inability to extend the distal phalanx of the thumb.
 - d) Loss of sensation over the deltoid.
 - e) Loss of sensation on palmar skin of the distal fourth and fifth fingers.

77. Radial nerve injury will result in a deficit in which of the following?
- a) Anesthesia over the deltoid muscle.
 - b) Flexion of the carpophalangeal joint.
 - c) Anesthesia over the palmar aspect of the fourth and fifth digits.
 - d) Extension of the DIP of the thumb.
 - e) Adduction of the thumb.
78. Which of the following is a function of the radial nerve?
- a) Flexion of the metacarpophalangeal joints.
 - b) Adduction of the first digit (thumb).
 - c) Extension of the first distal phalanx.
79. Compartment syndrome is least likely to occur with which one of the following?
- a) Compression of the lateral leg against stirrups.
 - b) Abdominal retractors limiting major vessel flow.
 - c) Prolonged (greater than 5 hours) lithotomy position.
 - d) Extreme external rotation of the leg.
 - e) Leg tightly wrapped in a bandage and elevated.
 - f) Prolonged popliteal support with a knee crutch.
80. When performing epidural analgesia in patient with idiopathic scoliosis and corrective back surgery all true EXCEPT:
- a) Increased risk of dural puncture.
 - b) Unreliable spread of local anesthetic.
 - c) False loss of resistance.
 - d) Increased risk of back pain following epidural anesthesia.
81. An epidural with a block to T5 causes a decrease in all of the following except:
- a) hepatic blood flow
 - b) resting minute ventilation
 - c) coronary blood flow
 - d) myocardial contractility
 - e) blood pressure
82. Which of the following is NOT involved in the etiology of decreased risk of DVT in patients with epidurals?
- a) increased blood flow to limb
 - b) local anesthetics directly depress platelet aggregation
 - c) opioids given into the epidural space depress platelet aggregation
 - d) fluid loading leads to hemodilution
83. All are true with epidurals and lower extremity surgery EXCEPT:
- a) sympathectomy increases blood flow to lower extremities
 - b) increased preload to treat hypotension induced by the epidural

- c) decreases blood viscosity
- d) local anesthetics decrease platelet adherence
- e) altered coagulation and fibrinolysis due to epidural opioids will decrease platelet adhesion

84. Concerning the epidural opiates:

- a) hydrophilic opioids have faster onset than lipophilic ones
- b) boluses have less side effects than infusions
- c) boluses provide better analgesia than infusions
- d) more than 20% of epimorph is absorbed into the subarachnoid space
- e) epidural vein distension increases systemic absorption

85. Which of the following is false regarding 50 ug of epidural fentanyl?

- a) serum level after a 24 hour infusion is the same as after an IV infusion
- b) peak level in CSF 20 minutes after administration
- c) effect starts 4-10 minutes after administration
- d) mechanism of action is increased substance P (mu receptors in CNS)
- e) alpha agonists are synergistic with opioids (eg. Epinephrine)

86. Hemodynamic changes with an epidural will worsen which of the following the most:

- a) ASD with left to right shunt
- b) Ao stenosis
- c) Repaired TOF
- d) Mitral stenosis
- e) MVP

87. All are true concerning an epidural blood patch, EXCEPT?

- a) Must wait for the block to wear off prior to performing a blood patch.
- b) Studies show that the most effective volume is 5-8 mL.
- c) common side effect is that of transient back pain.
- d) Use of a prophylactic blood patch is not widely practiced.

88. All of the following are side effects of epidural morphine, EXCEPT?

- a) Nausea and vomiting.
- b) Delayed hypoventilation.
- c) Urinary retention.
- d) Pruritis.
- e) Hives.

89. Which one of the following is true regarding fentanyl compared to morphine in the epidural space?

- a) Fentanyl is more likely to cause delayed respiratory depression.
- b) Morphine has a more rapid onset.
- c) Fentanyl has a longer duration.
- d) Fentanyl has a more rapid onset.

90. Epidural morphine for postoperative C/S analgesia causes all of the following, EXCEPT?
- Increased nausea and vomiting.
 - Urticaria.
 - Increased urinary retention.
 - Increased hemodynamic complications.
 - Reactivation of herpes labialis.
91. Which ONE of the following is true regarding epidural opioids?
- Increased side effects with infusions compared to boluses.
 - Increased analgesia with infusions compared to boluses. B 1322
 - Increased distension of the epidural space increases systemic absorption.
 - 20 % of epidural morphine crosses into the subarachnoid space.
 - A more hydrophilic agent has a faster onset.
92. Which one of the following is true about epidural opioids?
- There are fewer side effects with bolus administration.
 - There is better analgesia with bolus administration.
 - 20% crosses into the intrathecal space.
 - Epidural vein engorgement increases systemic absorption.
93. Regarding epidural opioids, which ONE of the following is true?
- More than twice the dose is required for caudal compared to lumbar injection.
 - Compared to an infusion, a bolus dose produces fewer side effects.
 - Compared to an infusion, a bolus dose gives better analgesia.
 - More than 20% of epidural morphine reaches the CSF.
 - Epidural venous congestion increases systemic absorption.
94. Concerning epidural opioids:
- Infusions have fewer side effects than boluses.
 - A bolus provides better analgesia than infusions.
 - Distension of the epidural space will increase uptake.
 - Morphine has less spread than fentanyl
95. Which ONE of the following is an advantage of epidural over GA for hip surgery?
- decreased blood loss.
 - Decreased thromboembolic phenomena post operatively.
 - Decreased blood flow to the extremities.
 - Greater chance of hypoxia in the first 24 hours.
 - Reduced long-term mortality.
96. All of the following are advantages of neuraxial block in patients with limited cardiac reserve, EXCEPT?
- Increased contractility.
 - Decreased afterload.

- c) Decreased stress response.
 - d) Coronary artery vasodilation.
97. Neuraxial anesthesia in patients with CAD will cause all of the following, EXCEPT?
- a) Decrease in LVEDP.
 - b) Decrease in LVESV.
 - c) Decrease in LVEDV.
 - d) Increase in contractility.
 - e) Decrease in LAP.
98. Epinephrine containing LA given epidurally will cause which of the following compared to LA without epinephrine:
- a) Increased HR
 - b) Increased BP
 - c) Increased contractility
 - d) Increased SVR
99. The peak onset of respiratory depression following epidural morphine is?
- a) 1-2 hours.
 - b) 3-6 hours.
 - c) 6-9 hours
 - d) 12-15 hours.
100. All of the following increase risk of late respiratory depression with epidural opioids EXCEPT:
- a) Concomitant use of parenteral opioids
 - b) Repeated epidural opioid doses
 - c) Use of lipophilic opioids
 - d) Underlying respiratory disease
 - e) elderly patient
 - f) concomitant parenteral opioid administration
101. Patient with high epidural. Most likely cause of respiratory arrest?
- a) Phrenic nerve paralysis
 - b) midbrain hypoperfusion
 - c) blockade of chest wall
 - d) Intercostal paralysis
 - e) local anesthetic toxicity
102. Which of the following is TRUE regarding an epidural hematoma?
- a) There is always lumbar back pain
 - b) It is the number 1 cause of paraplegia after thoracic surgery
 - c) It is always associated with the use of an indwelling catheter
 - d) Surgical decompression within 12 hours must be done if a reasonable chance of recovery is expected

- e) Low dose heparin is not a problem because the coagulation parameters are always normal
103. An elective AAA repair is being performed under combined epidural/GA. Which of the following is recommended to prevent epidural hematoma formation?
- Limit heparin to 5000 units.
 - Give heparin at least 1 hour after epidural placement.
 - Insert the epidural after the patient is asleep.
 - Remove the epidural immediately post-op in the OR.
 - Wait for 4 hours after heparinization to place the epidural catheter.
104. Regarding epidural hematoma:
- It's the most common cause of paraplegia following AAA surgery.
 - Back pain is always present.
 - It is most commonly associated with in-dwelling catheters.
 - Surgical decompression within 12 hours is necessary in order that there is a chance of recovery.
105. Epidural hematoma is:
- Always associated with backache.
 - Must be decompressed within 12 hours.
 - Always is associated with continuous epidural infusions.
 - Does not occur in patients with normal coagulation parameters
106. In addition to focal neurological symptoms which of the following is a commonly seen presenting symptom in epidural haematoma formation?
- Severe back pain
 - Local back tenderness
 - Loss of bladder and bowel control
 - Fever
107. Which ONE of the following is true regarding a patient with an epidural abscess?
- Treatment is antibiotics only.
 - The most common organism is *Staphylococcus aureus*.
 - Back pain is not a common finding.
 - It is most commonly associated with continuous lumbar epidural infusions.
 - There is increased risk of abscess with a lumbar epidural catheter.
 - There is a clear association between epidural steroids and abscess.
108. A femoral nerve block is performed with 20 mL of local anesthetic (UofT99: 2% lidocaine). The area of anesthesia will be:
- Anteromedial thigh.
 - Medial knee.
 - Lateral thigh.
 - Posterior thigh.

- e) Lateral knee.
 - f) Popliteal fossa.
 - g) Lateral aspect of foot.
109. All of the following nerves must be blocked for surgery on the thigh, EXCEPT?
- a) Sciatic.
 - b) Iliohypogastric.
 - c) Femoral.
 - d) Obturator.
 - e) Lateral femoral cutaneous.
 - f) Posterior cutaneous nerve of the thigh.
110. The best regional technique for knee arthroscopy with a tourniquet is
- a) Femoral nerve block.
 - b) Lumbar plexus and transgluteal sciatic nerve block.
 - c) Femoral 3-in-one block.
 - d) Sciatic nerve block in the popliteal fossa and lumbar plexus block.
111. What is the most appropriate for knee arthroscopy with a tourniquet?
- a) Sciatic nerve at the popliteal fossa and lumbar plexus block.
 - b) Transgluteal sciatic nerve block and lumbar plexus block.
 - c) Transgluteal sciatic nerve block and obturator nerve block.
 - d) Lateral femoral cutaneous and obturator nerve block.
112. With respect to the ilioinguinal nerve, which ONE of the following statements is true?
- a) It lies between the internal and external obliques.
 - b) Its block can replace a caudal for orchidopexy.
 - c) It is a branch of L2.
 - d) It can be blocked by infiltration around the superior anterior iliac spine.
113. All are true with respect to ilioinguinal nerve block, EXCEPT?
- a) Nerve courses between internal and external oblique muscles.
 - b) Nerve is a branch of L2.
 - c) Femoral nerve block may occur as a complication.
 - d) Can be blocked close to the ASIS.
 - e) May be used for post-operative analgesia following hernia repair (instead of caudal).
114. Following inguinal hernia a patient develops chronic ilioinguinal nerve pain. Which of the following would be seen on physical exam?
- a) Pain to light touch in the groin
 - b) Problems with hip flexion
 - c) Glossy skin changes in groin
 - d) Lack of sensation to lateral thigh
115. What is the location of the needle in an intercostal nerve block?

- a) Superior border of rib.
 - b) Before the artery and vein join in.
 - c) Posterior angle of the rib.
 - d) Prior to the sympathetics joining in.
116. An intercostal nerve block is typically done at?
- a) The posterior angle of the rib.
 - b) Distant from the intercostal artery and vein.
 - c) Proximal to where the sympathetic fibers join (UofT99: Proximal to the preganglionic take-off).
 - d) Distal to where the lateral cutaneous branch takes off (UofT99: Prior to the lateral cutaneous branch).
 - e) On the superior aspect of the rib.
117. Interscalene blockade is typically associated with all of the following EXCEPT:
- a) Anesthesia to the shoulder and upper arm
 - b) Anesthesia to the ulnar border of the forearm
 - c) Anesthesia of the musculocutaneous nerve
 - d) Anesthesia to the radial and median nerves of the upper arm
 - e) Possible Horner syndrome by spread to the sympathetic chain.
118. The interscalene approach to the brachial plexus involves all of the following EXCEPT:
- a) Head positioning so that it is turned to the opposite side
 - b) Palpation of the groove between the anterior and middle scalene muscle, which is located by having the patient tense the scalene muscles by raising the head slightly in the sniffing position.
 - c) Injection of 25-30 mls of local anesthetic
 - d) Introduction of the needle perpendicular to the skin in all planes so that it is directed medially, cephalad, and slightly anteriorly.
 - e) Locating the cricoid cartilage.
119. Complications of the interscalene approach to the brachial plexus may include:
- a) puncture of the lung viscera and a pneumothorax.
 - b) injection of local anesthetic into the epidural or subarachnoid space.
 - c) intravascular injection of local anesthetic via the vertebral artery.
 - d) ipsilateral Horner syndrome
120. An 18 year old man has a seizure during placement of an interscalene brachial plexus block with 2% lidocaine. The anesthesiologist begins to hyperventilate the patient's lungs with 100% O₂ using an anesthesia bag and mask. The rationale for this therapy is to:
- a) Decrease delivery of lidocaine to the brain
 - b) Prevent hypoxia
 - c) Hyperpolarize the nerve membranes
 - d) Conversion of lidocaine to the protonated (ionized) form

121. Patient 96 hours post interscalene block for shoulder arthroscopy, the patient is unable to abduct shoulder plus has loss of sensation over lateral arm between shoulder and elbow. Which part of brachial plexus is most likely affected?
- a) radial nerve
 - b) suprascapular nerve
 - c) musculocutaneous nerve
 - d) axillary nerve
 - e) posterior cord
122. The incidence of ipsilateral diaphragmatic paralysis in Winnie's interscalene block is?
- a) 5%.
 - b) 10%.
 - c) 25%.
 - d) 50%.
 - e) 100%.
123. All of the following are landmarks for BPB, EXCEPT?
- a) Sternocleidomastoid.
 - b) Interscalene groove.
 - c) Subclavian artery.
 - d) Cricoid cartilage.
124. Which one of the following is NOT a landmark for an interscalene BPB?
- a) Cricoid cartilage.
 - b) Posterior border of the SCM.
 - c) Interscalene groove.
 - d) Subclavian artery.
 - e) C6 tubercle
125. Following interscalene brachial plexus block, which nerve is not well blocked?
- a) Median nerve.
 - b) Ulnar nerve.
 - c) Radial nerve.
 - d) Musculocutaneous nerve.
 - e) Axillary nerve.
126. Local anesthetic potency is related to:
- a) pKa
 - b) lipid solubility
 - c) pH of the solution
 - d) protein binding
127. Increased risk of TRI associated with all except:
- a) Lidocaine 2%
 - b) position

- c) obesity
 - d) type of needle used
 - e) outpatient procedure
128. Comparing clinically equivalent local anaesthetic doses of Lidocaine and Bupivacaine, which of the following is true?
- a) Similar CNS toxicity
 - b) More myocardial depression with Lidocaine
 - c) Bupivacaine cardiac toxicity is enhanced by hypocarbia
 - d) AV blockade is seen more with Lidocaine
129. In a patient with cardiotoxicity caused by bupivacaine you will see:
- a) decreased toxicity compared to lidocaine
 - b) diminished cardiotoxicity with hypercarbia
 - c) diminished response to epinephrine
 - d) usually atrial fibrillation
130. Which of the following is true in comparing ropivacaine and bupivacaine?
- a) lower pKa than bupivacaine
 - b) decreased cardiac toxicity makes it desirable for IV regional block
 - c) something about protein binding
 - d) more rapid elimination
 - e) Less CNS toxicity produce convulsions in animals at the same dose
 - f) Mechanism of action for ropivacaine is initiation of nerve conduction via sodium channel
131. Which is false regarding bupivacaine cardiotoxicity:
- a) increased incidence in pregnant patients
 - b) hypercarbia increases incidence
 - c) hypoxia increases incidence
 - d) bretylium is not effective for treatment
 - e) less cardiotoxicity with ropivacaine
132. A weak acid has a pKa = 4.4 . At a pH = 1.4 the ratio of HA/A⁻ is:
- a) 1/1000
 - b) 3
 - c) 1/3
 - d) 300
 - e) X 1000
133. 100 mg lidocaine ia given to a 70kg male. What is the time for 90% elimination of the drug?
- a) 1.5 hours
 - b) 3 hours
 - c) 4.5 hours

- d) 6 hours
 - e) 8 hours
134. What is the first step in the metabolism of amide anesthetics?
- a) Glucuronidation.
 - b) Oxidative deethylation.
 - c) Reductive dealkylation.
 - d) Plasma hydrolysis.
 - e) N-methyl reduction.
 - f) Hoffman degradation.
 - g) Conjugation
135. How do local anesthetics exert their effect?
- a) Increase repolarization of membranes.
 - b) Decrease membrane potential.
 - c) Increase chloride ion conductance.
 - d) Inhibit conformational change in the sodium channel.
136. Which local anesthetic has the lowest protein binding?
- a) Mepivacaine.77%
 - b) Lidocaine.70%
 - c) Prilocaine. 55%
 - d) Bupivacaine.95%
 - e) Procaine 7%
 - f) Etidocaine.94%
137. Adding bicarbonate to a local anaesthetic solution will cause which of the following?
- a) decreased amount of nonionized local anaesthetic
 - b) may not cause precipitation in an alkaline solution
 - c) increases pCO₂ of the solution
 - d) delay the onset of the block
 - e) addition of 1mEq of bicarb to 10cc 1.5% lidocaine increased pH >10
 - f) Results in increased ionized fraction.
 - g) Longer duration of effect.
 - h) No change in pH.
 - i) Decreases the partial pressure of carbon dioxide.
138. All of the following are true with respect to local anesthetic pharmacokinetics, EXCEPT?
- a) pKa correlates with local anesthetic potency.
 - b) pKa correlates with local anesthetic toxicity.
 - c) Lidocaine has faster onset than bupivacaine.
 - d) Etidocaine is more potent than lidocaine because of greater lipid solubility.
139. Which one of the following block sites is associated with the greatest serum uptake of local anesthetic?

- a) Brachial plexus.
 - b) Intercostal.
 - c) Caudal/epidural.
 - d) Subcutaneous.
 - e) Femoral
 - f) Spinal.
 - g) Subcutaneous infiltration.
140. All of the following are true regarding local anesthetic toxicity, EXCEPT?
- a) Ropivacaine is less cardiotoxic than bupivacaine.
 - b) Acute respiratory acidosis decreases the threshold for bupivacaine toxicity.
 - c) Pregnant patients are more susceptible to bupivacaine cardiotoxicity than nonpregnant patients.
 - d) Bretylium is not effective for bupivacaine induced ventricular tachycardia.
141. All are true regarding toxicity of local anesthetics, EXCEPT?
- a) CVS toxicity is minimally responsive to epinephrine.
 - b) Cardiotoxicity is less with ropivacaine than bupivacaine.
 - c) Cardiotoxicity is worse with hypercarbia.
 - d) Cardiotoxicity is worse with pregnancy.
 - e) Cardiotoxicity is worse with hypoxia.
142. Regarding the cardiotoxicity of bupivacaine:
- a) May be unresponsive to epinephrine.
 - b) Toxicity is increased with hypercarbia.
 - c) Presents with supraventricular tachyarrhythmia.
 - d) Pregnant patients are resistant.
143. All are true regarding local anesthetic toxicity, EXCEPT?
- a) Hypercarbia decreases the threshold for cardiotoxicity.
 - b) Hypoxia increases risk of cardiotoxicity.
 - c) Pregnancy increases susceptibility to cardiotoxicity from local anesthetics.
 - d) Ropivacaine is less cardiotoxic than bupivacaine.
 - e) Bretylium is ineffective in the management of LA cardiotoxicity.
144. 2-Chlorprocaine is not a good choice for ambulatory anesthesia because of?
- a) Back pain.
 - b) Risk of neurologic injury.
 - c) Short duration of action.
 - d) Produces greater motor than sensory block.
145. Which local anesthetic has the largest therapeutic index with regard to CNS toxicity:
- a) Chlorprocaine
 - b) Lidocaine
 - c) Bupivacaine

- d) Ropivacaine
146. Comparing a highly hydrophobic local anesthetic with a moderately hydrophobic one, which of the following is true
- a) Longer duration of action
 - b) Faster onset
 - c) Lower potency
 - d) greater tissue absorption
147. Which amide local anesthetic is metabolized by liver and tissue cholinesterases:
- a) Lidocaine
 - b) Bupivacaine
 - c) Ropivacaine
 - d) Tetracaine
148. Compared with moderately hydrophobic local anesthetics, highly hydrophobic LA's are:
- a) Less potent
 - b) Longer duration of action
 - c) Faster onset of action
 - d) Less protein bound
149. The correct arrangement of local anesthetics in order of their ability to produce cardiotoxicity from most to least is:
- a) Bupivacaine, lidocaine, ropivacaine
 - b) Bupivacaine, ropivacaine, lidocaine
 - c) Lidocaine, bupivacaine, ropivacaine
 - d) Ropivacaine, bupivacaine, lidocaine
 - e) Lidocaine, ropivacaine, bupivacaine
150. The primary determinant of local anesthetic potency is:
- a) pKa
 - b) Molecular weight
 - c) Lipid solubility
 - d) Concentration
 - e) Protein binding
151. Which of the following local anesthetics has the lowest ratio of dosage required for CV collapse to dosage required for CNS toxicity
- a) Lidocaine
 - b) Etidocaine
 - c) Bupivacaine
 - d) Prilocaine
 - e) Chloroprocaine
152. Which is true regarding the musculocutaneous nerve?

- a) contribution from all spinal nerve roots
 - b) lies inferior to the axillary artery at the level of the axilla when the arm is abducted to 90°
 - c) lies outside the perivascular sheath at the axilla
 - d) purely sensation to the upper limb
 - e) lies medial to the tendon of the palmaris longus at the wrist
153. Blockade of the musculocutaneous nerve results in the inability to do:
- a) forearm flexion
 - b) abduction of thumb
 - c) pronation of arm
 - d) extension of distal phalynx
 - e) wrist flexion
154. Which of the following is TRUE regarding low molecular weight heparin and neuraxial anesthesia?
- a) It is useful to monitor PTT to guide timing of catheter insertion
 - b) It is safe to insert the epidural catheter 2-4 hours after the last dose-10-12 hours after LMWH or 2 hours if s/c LMWH
 - c) It is safe to remove the epidural catheter 2-4 hours after the last dose-10-12 jours
 - d) The incidence hematoma is less with spinal than with epidural blockade
 - e) One may give protamine and then insert the catheter-no.
155. Regarding an MS patient which of the following statements is true?
- a) There is no difference the relapse rate between general and regional anesthesia
 - b) There is an increased relapse rate if morphine is used intrathecally
 - c) There is a difference in the relapse rate with opioid use in the regional anesthesia
 - d) There is an increased relapse rate with epidural anesthesia
 - e) There is a difference in the relapse rate beteewn epidural and spinal anesthesia
 - f) The concentration of the local anesthetic used during regional will influence relapse rates
156. Regarding a patient with ALS which statement is true?
- a) The respiratory system is rarely involved
 - b) Epidural anesthesia is not contraindicated
 - c) Spinal anesthesia is not contraindicated
 - d) It is due to a LMN lesion
157. Which statement is true regarding myofascial pain?
- a) Biopsies of trigger points show characteristic changes.
 - b) Muscle weakness without atrophy occurs.
 - c) Physiotherapy is not helpful.
 - d) Non-radiating pain from trigger points.
 - e) Increased ESR.

158. All the following are true about myofascial pain syndrome except
- a) It affects specific muscles
 - b) It is non articular
 - c) Associated with trigger zone on the muscle
 - d) EMG studies are diagnostic
 - e) Limits the movement of the affected muscle
159. Patient on 150mg MS Contin BID. What is the infusion of morphine needed per hr?
- a) 1mg /ml
 - b) 2.5mg /ml
 - c) 4mg/ml
 - d) 12mg/ml
 - e) 15mg /ml
160. Effects of gabapentin
- a) increases nociceptive threshold
 - b) does not change seizure threshold
 - c) binds to GABA receptors
 - d) effective in post herpetic neuralgia
 - e) modulates peripheral mediators of pain
161. All are effects of IV morphine EXCEPT:
- a) Causes orthostatic hypotension
 - b) Stimulates the chemoreceptor trigger zone
 - c) Causes sphincter of Oddi constriction
 - d) Causes abolition of shivering
 - e) Pruritus
162. Which of the following is the MOST likely cause of significant respiratory depression with patient controlled analgesia (PCA)?
- a) equipment malfunction
 - b) background infusion
 - c) pre-existing lung disease
 - d) programming error
 - e) highly potent opioids
163. What opioid has CNS toxicity?
- a) Morphine
 - b) Meperidine
 - c) Fentanyl
 - d) Sufentanil
 - e) Codeine
167. Naloxone

- a) Half time of 60-90 min
 - b) Dose of 0.4mg does not cause side effects
 - c) It peaks at 15-20 seconds
 - d) has active metabolites
168. The opioid which has a metabolite with CNS effects that accumulates with renal failure is:
- a) Morphine
 - b) Meperidine
 - c) Fentanyl
 - d) Sufentanil
 - e) Alfentanil
169. Which of the following statements regarding the side-effects of narcotics is TRUE?
- a) High dose opioids may directly depress the vomiting centre
 - b) Codeine is less respiratory depressing in children compared to Morphine in equipotent doses
 - c) Meperidine 0.5mg IV causes significant myocardial depression
 - d) Morphine causes more potent histamine release than Meperidine
170. Which of the following metabolites have antinociceptive properties?
- a) Morphine-6-glucuronide
 - b) Morphine-3-glucuronide
 - c) Normorphine
 - d) Normeperidine
171. A patient receives 150mg of slow release morphine twice daily. What would be the infusion rate of morphine intravenously.
- a) 2.5mg/h
 - b) 4mg/h
 - c) 0.5mg/h
 - d) 1 mg/h
172. All are complications associated with meperidine EXCEPT ONE:
- a) Increased biliary tract pressure
 - b) Diminished myocardial contractility
 - c) Tachycardia
 - d) Increased peripheral resistance
173. Regarding Gabapentin
- a) It raises the nociceptive threshold
 - b) It acts peripherally to decrease pain perception
 - c) It acts via binding to GABA receptors
 - d) it is an effective treatment for post-herpetic neuralgia
174. Regarding pain transmission, which is TRUE?

- a) A-delta fibres are responsible for slow component or burning pain
 - b) C fibres are responsible for fast component or localized pain
 - c) A-delta and C neurons contain a wide variety of neurotransmitters
 - d) A-delta and C neurons are only found centrally (in spinal cord)
 - e) Substance P is the only neurotransmitter in pain pathways
 - f) neuromodulation occurs at the spinal cord level only
175. Regarding the gate control theory of pain, modulation occurs where?
- a) substantia gelatinosa
 - b) dorsal horn neurons
 - c) spinothalamic tract
 - d) thalamus
176. All are involved in ascending pain perception EXCEPT:
- a) ventral posterolateral thalamus
 - b) lateral cervical nucleus
 - c) post-ganglionic sympathetic fibres
 - d) dorsolateral funiculus
177. A patient has laceration to his hand. Several days later, the skin surrounding the laceration also hurts. This is best explained by
- a) substance P peripherally stimulates NMDA receptors
 - b) augmented spinothalamic activity
 - c) augmented depolarization of C fibres
 - d) central sensitization of A Delta and C fibres
178. TENS does not work in:
- a) Phantom limb pain
 - b) Peripheral nerve injury
 - c) Myofascial pain
 - d) Central pain
179. All decrease nociceptive pain by inhibitory modulation, EXCEPT:
- a) Norepinephrine
 - b) Substance P
 - c) Beta-endorphins
 - d) Neostigmine
180. A patient sustains an injury to their arm and 3 days later has increasing pain to light touch. Which of the following is the cause?
- a) Substance P activating NMDA
 - b) Increased A fibre activity
 - c) Increased C fibre activity
 - d) Increased activity in the spinothalamic tract

181. Which of the following is a descending inhibitory pathway:
- a) neurons in laminae I and V
 - b) dorsolateral funiculus
 - c) ventroposterolateral thalamus
 - d) medullary neurons locus ceruleus
 - e) spinoreticular pathway
182. With respect to pain pathways, all are true except
- a) substance P activates the reticular activating system
 - b) the spinothalamic tract has two divisions
 - c) there are descending pathways from the brain which modulate the dorsal columns
183. Which of the following regarding pain from a peripheral nerve is TRUE?
- a) A delta fibres conduct slow pain impulses of the burning type
 - b) C fibres conduct fast pain
 - c) A delta and C fibres are both involved and are peripheral
 - d) Neuroinflammation occurs in the dorsal horn
 - e) Substance P is the only neurotx involved in pain –see above (bradykini, LT, PG, histamine, 5-HT)
184. Which is present in both acute and chronic RSD
- a) coarse hair growth
 - b) atrophic skin changes
 - c) dysesthesias
 - d) burning pain
 - e) ankylosis
185. A patient sustained a slash to the wrist and has developed persistent pain around the site. This pain can be attributed to:
- a) A fibers
 - b) Substance P
 - c) fibers
 - d) GABA
 - e) Spinothalamic tract
186. Regarding the gate control theory of pain, modulation occurs where?
- a) Substantia gelatinosa
 - b) Dorsal horn neurons
 - c) spinothalamic tract
 - d) Thalamus
 - e) Dorsal columns
187. Which of the following is true regarding differential block:
- a) useful to differentiate between malingering and psychogenic pain
 - b) may only be performed with amide local anesthetics

- c) it can help to predict success of nerve blocks or surgery
 - d) it depends on different nerve conduction velocities
188. Which one of the following is a component of the descending pain inhibitory pathway?
- a) Locus ceruleus.
 - b) Ventroposterolateral thalamic nuclei.
 - c) Dorsolateral funiculus.
 - d) Dorsal root ganglion.
 - e) Substantia gelatinosa.
189. All of the following are ascending pathways, EXCEPT?
- a) Ventroposterolateral nucleus of the thalamus.
 - b) Lateral cervical nucleus.
 - c) Spinothalamic tract.
 - d) Dorsolateral funiculus.
 - e) Anterolateral funiculus.
190. Which one of the following is not a pain pathway?
- a) Ventral posterolateral thalamic nucleus.
 - b) Lateral cervical nucleus.
 - c) Dorsal horn.
 - d) Spinothalamic tracts.
191. The post-ganglionic sympathetic fiber is of which type?
- a) A delta
 - b) A beta
 - c) B
 - d) C
192. Which one of the following nerve fibers are involved with postganglionic sympathetic transmission?
- a) A-delta.
 - b) A-beta.
 - c) A-gamma.
 - d) B.
 - e) C.
193. What nerve fiber conducts temperature sensation?
- a) A delta.
 - b) A beta.
 - c) A gamma.
 - d) B.
 - e) C.
194. Which of the following involves muscarinic receptors?

- a) Parasympathetic ganglia.
 - b) Sympathetic ganglia.
 - c) Postsynaptic adrenal medulla.
 - d) Presynaptic sympathetic myocardial terminals.
 - e) Postsynaptic neuromuscular junction.
195. Muscarinic receptors are found on:
- a) Parasympathetic ganglia.
 - b) Sympathetic ganglia.
 - c) Presynaptic adrenergic nerves of the myocardium.
 - d) Adrenal gland.
 - e) Neuromuscular junction.
196. Where is muscarinic R stimulation seen?
- a) Parasympathetic ganglion synapse.
 - b) Sympathetic ganglion synapse.
 - c) Myocardial pre-synaptic.
 - d) Post-synaptic adrenal gland.
 - e) Post-synaptic neuromuscular junction.
197. Muscarinic receptors exist at:
- a) Parasympathetic ganglion.
 - b) Adrenal medulla.
 - c) Presynaptic adrenergic receptors of the heart.
 - d) Sympathetic ganglia.
 - e) Neuromuscular junction.
198. The final destination of a stimulus to the left arm is?
- a) Left thalamus.
 - b) Left precentral gyrus.
 - c) Left periaqueductal grey mater.
 - d) postcentral gyrus.
199. All are anatomical structures participating in ascending pathway for pain perception except?
- a) Ventral posterolateral nucleus of thalamus
 - b) Lateral cervical nucleus
 - c) Postganglionic sympathetic fibers
 - d) Dorsolateral funiculus
200. Regarding pain transmission, which is TRUE?
- a) A-delta fibers are responsible for slow component or burning pain
 - b) C fibers are responsible for fast component or localized pain
 - c) A-delta and C neurons contain a wide variety of neurotransmitters
 - d) Inflammation only occurs peripherally

201. A diabetic patient has a persistent foot drop and sensory deficit 48h following popliteal block. Which of the following is correct?
- a) Patient requires CT scan
 - b) Patient requires surgical exploration
 - c) Patient should be told to wait 24h and reassess
 - d) Patient requires electromyography
202. Retrobulbar block can be associated with all except
- a) contra-lateral amaurosis
 - b) seizure
 - c) activation of oculomotor reflex
 - d) lacrimal duct disruption
 - e) retrobulbar hematoma
203. Following retrobulbar block, all may indicate the onset of brainstem anesthesia EXCEPT:
- a) Increased vitreous pressure
 - b) Apnea
 - c) Shivering
 - d) Decreased level of consciousness
 - e) Contralateral amaurosis
204. Which of the following decreases the incidence of globe injury in retrobulbar block?
- a) superomedial gaze-no neutral or downward and inward
 - b) short axial length
 - c) long sharp needle-not longer than 31 mm
 - d) previous scleral buckle-no
 - e) deeper penetration-no
205. Which one of the following decreases the risk of globe perforation in retrobulbar block?
- a) Superomedial gaze.
 - b) Long sharp needle.
 - c) Short axial length.
 - d) Previous scleral buckle.
206. Which ONE of the following will NOT increase the risk of ocular damage during retrobulbar block?
- a) Superonasal gaze.
 - b) Sharp, long beveled needle.
 - c) Deeper penetration.
 - d) Short axial length.
 - e) Previous scleral buckle.
207. All increase the risk of a retrobulbar block, EXCEPT?
- a) Superomedial gaze.

- b) Short axial length.
 - c) Previous scleral buckle.
 - d) Sharp needle with long bevel.
208. During retrobulbar block, the risk of damage to the eye is decreased by?
- a) Looking superior and nasally during the block.
 - b) Using a sharp long beveled needle.
 - c) Short ocular axis.
 - d) Previous scleral buckle.
 - e) Deeper needle penetration.
209. Complications of retrobulbar block include all of the following, EXCEPT?
- a) Brainstem anesthesia.
 - b) Tinnitus.
 - c) Unconsciousness.
 - d) Tachycardia.(oculocardiac reflex)
 - e) Hypertension.
210. Which ONE of the following will not be seen in brainstem anesthesia following retrobulbar block?
- a) Convulsions.
 - b) Loss of consciousness.
 - c) Tinnitus.
 - d) Hypertension.
 - e) Increased HR.
211. Regarding the oculocardiac reflex:
- a) It is blocked 100% by atropine.
 - b) Blocked 100% with atropine and halothane.
 - c) Made worse with succinylcholine.
 - d) It is a trigeminal-vagal reflex arch.
 - e) Thiopental is effective at reversing the bradycardia.
212. The afferent limb of the oculocardiac reflex is?
- a) The glossopharyngeal nerve (CN IX).
 - b) The vagus nerve (CN X).
 - c) The trigeminal nerve (CN V).
 - d) The optic nerve (CN I).
 - e) The facial nerve (CN VII).
 - f) Oculomotor (CN III).
213. Following Retrobulbar block, all may indicate the onset of brainstem anesthesia EXCEPT:
- a) Increased vitreous pressure
 - b) Apnea

- c) Shivering
- d) Contralateral amaurosis fugax

214. All of the following are signs of brainstem anesthesia following retrobulbar block, EXCEPT?

- a) Increased intra-vitreous pressure
- b) Contra-lateral Amaurosis Fugax
- c) Shivering
- d) Loss of consciousness

215. A sciatic nerve block is performed in a healthy 26 year old male patient for bunion surgery. 15 mls of 1.5% mepivacaine is slowly injected after the landmarks are identified and a paresthesia is elicited in the great toe. In what order would the following nerve fibers be blocked?

- a) Sympathetic, proprioception, pain, motor
- b) Sympathetic, pain, proprioception, motor
- c) Motor, pain, proprioception, sympathetic
- d) Pain, proprioception, sympathetic, motor
- e) Pain, proprioception, motor, sympathetic

216. Important landmarks for performing a sciatic nerve block (classic approach of Labat) include

- a) Iliac crest, sacral hiatus, greater trochanter
- b) Iliac crest, coccyx, and greater trochanter
- c) PSIS, coccyx, and greater trochanter
- d) PSIS, greater trochanter, and sacral hiatus
- e) PSIS and greater trochanter

217. Branches of the sciatic nerve include:

- a) Posterior tibial
- b) Common peroneal
- c) Sural
- d) Saphenous

218. Sciatic nerve block posterior approach landmarks

- a) lesser trochanter
- b) iliac crest
- c) ischial tuberosity
- d) coccyx

219. Which of the following IS a landmark for sciatic nerve block via the posterior approach?

- a) Tip of coccyx.
- b) superior Iliac crest.
- c) Ischial tuberosity.

- d) Lesser trochanter.
 - e) L2 spinous process.
220. Which test is most appropriate given a patient with sciatic nerve root pain and a L5 neurological deficit?
- a) LP
 - b) EMG
 - c) evoked potentials
 - d) MRI
 - e) spinal radiography.
221. Which of the following is NOT a landmark for sciatic nerve block?
- a) Tip of coccyx.
 - b) Iliac crest.
 - c) Ischial tuberosity.
 - d) Lesser trochanter.
 - e) L5 spinous process.
222. Which one of the following is a landmark for sciatic nerve block (posterior approach)?
- a) Iliac crest.
 - b) Ischial tuberosity.
 - c) Lesser trochanter.
 - d) Tip of coccyx.
 - e) Second lumbar vertebra.
223. The location for posterior sciatic nerve block is:
- a) Ischial tuberosity, lesser trochanter. Greater trochanter
 - b) Tip of the coccyx.
 - c) Tip of the iliac spine.
 - d) Sacral cornu, greater trochanter
224. What is usually used as a landmark for the posterior approach to the sciatic nerve block?
- a) L2 vertebral body.
 - b) Ischial tuberosity.
 - c) Tip of the coccyx.
 - d) Lesser trochanter.
 - e) Superior aspect of the ischial crest.
225. Landmark for sciatic nerve block (posterior approach)?
- a) Superior margin of iliac crest.
 - b) Tip of coccyx.
 - c) Lesser trochanter.
 - d) Ischial tuberosity.
 - e) L₂ spinous process

226. Which neurotransmitter do benzodiazepines interact with?
- a) GABA
 - b) Dopamine
 - c) MAO
 - d) Muscarinic
 - e) Norepinephrine
227. Which is false regarding midazolam?
- a) extensively protein bound
 - b) increased half life in liver failure
 - c) increased half life in the elderly
 - d) imidazole ring increases lipid solubility
 - e) increased half life in renal failure
228. Benzodiazepines
- a) enhance the inhibitory effect of GABA
 - b) Decrease chloride transmembrane flux
 - c) works to enhance Glutamate receptor or increases glutamate
 - d) works via NMDA receptor
229. What is true of remifentanil metabolism?
- a) the context sensitive half time is independent of the time of infusion
 - b) affected by pseudocholinesterase deficiency
 - c) it is decreased with hepatic failure
 - d) metabolized by liver enzymes
 - e) prolonged elimination with liver disease
230. Peak respiratory depression effect of Remifentanil occurs at:
- a) 1 minute
 - b) 2 minutes
 - c) 5 minutes
 - d) 10 minutes
231. What is the cause of bradycardia after a spinal anesthetic to T10?
- a) Autonomic block of the cardiac accelerator fibers
 - b) Decreased right atrial pressure
 - c) Hypotension
 - d) Hypertension
232. What is true regarding spinal anesthesia vs general anesthesia for hip fracture in the elderly?
- a) Increased blood loss
 - b) Decreased incidence of DVT
 - c) Increased incidence of wound infection
 - d) Decreased incidence of urinary retention

233. Which is true regarding intrathecal morphine?
- a) elimination same as plasma 2-4 hrs
 - b) elimination is via vascular absorption and cord absorption
 - c) 20% crosses into CSF from epidural space
 - d) takes 8-12 hours to reach cervical levels
 - e) spread is related to posture
234. Bradycardia following spinal with sensory level at T10 is due to :
- a) hypertension
 - b) hypotension
 - c) loss of cardiac accelerators
 - d) spinal shock
235. An elderly patient is having a THR comparing spinal anesthesia to general anesthesia which of the following is true?
- a) There will be greater blood loss
 - b) There is a low incidence of DVT's
 - c) The wound healing will be prolonged
 - d) The discharge will be prolonged
 - e) The time to weight bearing will be prolonged
236. All are related to Transient Neurological Symptoms after spinal EXCEPT
- a) Outpatient surgery
 - b) Needle type
 - c) 2% Lidocaine
 - d) Obesity
 - e) Lithotomy position
237. Nausea and vomiting in neuraxial anesthesia is associated with all of the following EXCEPT:
- a) Hypotension
 - b) Addition of opioids
 - c) Unopposed vagal stimulation
 - d) Types of local anesthetic agents
238. Addition of 25mcg of Fentanyl to 1ml of 0.5% Bupivacaine for subarachnoid block results in:
- a) Increased incidence of delayed respiratory depression (>6 hours)
 - b) Increased incidence of nausea and vomiting
 - c) Increased success of block
 - d) Increased rate of transient neurological symptoms
239. Which is the most important in determining the spread of subarachnoid blockade?
- a) The height of the patient

- b) The site of injection
 - c) Barbotage
 - d) Needle orientation
 - e) Baricity
 - f) speed of injection
 - g) weight
240. Which is true regarding intrathecal morphine?
- a) elimination same as plasma 2-4 hrs
 - b) elimination is via vascular absorption and cord absorption
 - c) 20% crosses into CSF from epidural space
 - d) takes 8-12 hours to reach cervical levels
 - e) spread is related to posture
241. Which one of the following is typical of spinal headache?
- a) Rare in children under 13.
 - b) Occurs immediately after a spinal anesthetic.
 - c) Typically frontal in location.
 - d) Not postural in nature.
242. All of the following are true regarding epidural blood patch as therapy for post-dural puncture headache, EXCEPT?
- a) Must wait until the effects of the local anesthetic have worn-off before placing an EBP.
 - b) The most recent studies suggest that 5-10 mL is the optimum volume. Barash 64
 - c) The therapeutic effect of epidural blood is (may be) via increased pressure in the epidural and subarachnoid spaces.
 - d) The commonest complication following EBP is back pain.
 - e) Prophylactic placement has not been proven beneficial (UofT99: Prophylactic EBP are not in widespread use).
243. All affect the incidence of post-dural puncture headache, EXCEPT?
- a) Size of needle.
 - b) Features of the needle tip (pencil point vs. cutting).
 - c) Insertion technique (median vs. paramedian).
 - d) Whether or not the patient ambulates after the procedure.
 - e) Age, sex of patient.
 - f) Direction of bevel.
244. Which ONE of the following is NOT a side effect of intrathecal morphine?
- a) Nausea and vomiting.
 - b) Pruritis.
 - c) Respiratory depression.
 - d) Hives.
 - e) Urinary retention.

245. What is true regarding intrathecal morphine?
- a) After lumbar administration, it takes 8 to 12 hours to reach the cervical dermatomes.
 - b) The half-life in the CSF is the same as that in the plasma.
 - c) It is cleared from the CSF by vascular reabsorption and binding to the spinal cord.
 - d) Dosage is 50% less than via epidural route
246. Which one of the following statements about intrathecal morphine is correct?
- a) It takes 8-12 hours to reach cervical levels.
 - b) The primary route of elimination is by vascular uptake by the spinal cord.
 - c) Spread is related to posture.
 - d) The rate of elimination is the same as for an IV dose
247. The risk of respiratory depression following the use of intrathecal morphine is increased by all of the following, EXCEPT?
- a) Administration through a thoracic epidural.
 - b) Advanced age.
 - c) Chronic pre-operative use of opioids.
 - d) Administration of additional intravenous sedatives.
 - e) Chronic lung disease.
248. With respect to intrathecal fentanyl versus morphine, which is true?
- a) There is less pruritis.
 - b) Onset is slower.
 - c) Duration is longer.
 - d) There is a higher risk of delayed respiratory depression.
249. With respect to intrathecal fentanyl versus morphine, which is true?
- a) Morphine has a faster onset.
 - b) Fentanyl has a slower onset.
 - c) Fentanyl has a shorter duration.
 - d) Fentanyl causes more pruritis.
250. Which ONE of the following factors is important in the spread of local anesthetic in the intrathecal space?
- a) Patient height.
 - b) Needle direction.
 - c) Dose.
 - d) Intra-abdominal pressure.
 - e) Volume.
251. Isobaric local anesthetics injected intrathecally:
- a) Spread is dependant on dose.
 - b) Spinal canal shape affects level of block.
 - c) Solutions are commercially available.
 - d) Ideal for surgery above L1.

- e) Prepared by adding dextrose.
252. Isobaric local anesthetics injected intrathecally:
- Solutions are readily available.
 - Can be prepared by adding dextrose.
 - Spread is a function of volume.
 - Duration is a function of dose.
 - The shape of the spinal canal influences block height.
253. Risk of TNS is associated with all of the following EXCEPT
- Needle type
 - Obesity
 - Ambulatory surgery
 - Lidocaine 2%
 - Lithotomy
254. Regarding sudden respiratory arrest with spinal anesthesia, which is the most likely cause?
- Phrenic nerve paralysis
 - Brainstem hypoperfusion
 - Intercostal paralysis
 - Local anesthetic toxicity
255. What is the most likely effect of adding 25mcg of fentanyl to 1mL of 0.5% bupivacaine injected intrathecally:
- Increased respiratory depression at 6-8h
 - Increased block success
 - Increased nausea and vomiting
 - Increased hypotension
256. Pick the TRUE statement concerning transient neurologic symptoms (TNS) after spinal anesthesia
- Increased risk of TNS is associated with marcaine
 - The baricity of the local anesthetic is an important factor in the development of TNS
 - The dose of local anesthetic is an important factor in the development of TNS
 - TNS may be a manifestation of subclinical neurotoxicity
 - The incidence is independent of patient position
257. Which of the following statements concerning spinal administration of opioids is/are FALSE?
- 1) It is dependent on supraspinal mechanisms
 - 2) combining a local anesthetic with opioids results in synergistic analgesia
 - 3) 2-Chloroprocaine appears to decrease the effectiveness of epidural opioids
 - 4) spinal administration of opioids provides analgesia primarily by attenuating the A-delta fiber nociception

A if 1,2 and 3 are correct

B if 1 and 3

C if 2 and 4

D if 4

E if all

258. Which of the following statements regarding spinal anesthesia is/are FALSE?

- 1) Early ambulation after spinal anesthesia may increase the incidence of PDPH.
- 2) Nausea after spinal or epidural anesthesia is the same as after general anesthesia
- 3) Chloroprocaine carries the same risk of TNS as does lidocaine
- 4) Adding fentanyl to the local anesthetic in the spinal technique improves the tolerance for tourniquet pain

A if 1,2 and 3 are correct

B if 1 and 3

C if 2 and 4

D if 4

E if all

259. Which of the following techniques is LEAST effective in treatment of pruritus from administration of neuraxial opiates?

- a) Propofol 20mg IV
- b) Nalbuphine 10 mg IV
- c) Diphenhydramine 25 mg IV
- d) Dexmedetomidine 30 mcg IV
- e) Hydroxyzine 20 mg IM

260. An analgesic effect similar to the epidural administration of 10 mg of morphine could be achieved by which dose of intrathecal morphine?

- a) 10 mg
- b) 5 mg
- c) 1 mg
- d) 0.1 mg
- e) There is no correlation

261. A 56 year-old woman is to undergo knee surgery under spinal anesthesia. TRUE statements concerning the immediate physiologic response to surgical incision include

- a) The CV stress response will be blocked, but the adrenergic response will not
- b) The adrenergic stress response will be blocked, but the CV response will not.
- c) The CV response will be blocked but the adrenergic response will be augmented
- d) Both the adrenergic and CV responses will be blocked
- e) Neither the adrenergic or CV response will be blocked

262. The primary mechanism by which the action of tetracaine is terminated when used for spinal anesthesia is:

- a) Hoffman degradation
- b) Uptake into neurons
- c) Hydrolysis by pseudocholinesterase
- d) Systemic absorption
- e) Hydrolysis by non-specific esterases

263. When injecting isobaric 0.75% bupivacaine via the subarachnoid route, which of the following will have the greatest impact on the level of sensory blockade?

- a) Patient position
- b) Barbotage
- c) Coughing during placement of the block
- d) Patient weight
- e) Addition of epinephrine to the local anesthetic solution

264. High spinal anesthesia can cause severe hypotension, caused primarily by

- a) decreased SVR
- b) Decreased CO secondary to decreased myocardial contractility
- c) decreased CO secondary to decreased preload
- d) Increased shunting through arterioles
- e) Decreased CO secondary to a low heart rate

265. Select the FALSE statement regarding spinal anatomy and spinal anesthesia

- 1) Procaine provides longer anesthesia than does Tetracaine.
- 2) A high thoracic sensory block will result in total sympathetic blockade
- 3) The dural sac extends to the S3-4 interspace
- 4) The largest vertebral interspace is L5-S1

A if 1,2 and 3 are correct

B if 1 and 3

C if 2 and 4

D if 4

E if all

266. Which of the following patients would be LEAST likely to develop a decrease in HR with a high (C7) spinal anesthetic?

- a) A 15 year old female with a history of WPW syndrome
- b) A 57 year old diabetic man with a history of orthostatic hypotension
- c) A 84 year old with glaucoma and taking pilocarpine eye drops
- d) A 49 year old who had a MI 1 month ago, now taking procainamide
- e) A 27 year old with a T5 paraplegia

267. An entire epidural dose of local anesthetic is inadvertently administered into the subarachnoid space. Expected physiologic effects include:

- 1) Dilated pupils
- 2) Hypotension
- 3) Bradycardia
- 4) Apnea

A if 1,2 and 3 are correct
B if 1 and 3
C if 2 and 4
D if 4
E if all

268. True statements regarding additives to local anesthetics for neuraxial blocks include

- 1) Intrathecal clonidine has analgesic properties
- 2) Intrathecal phenylephrine has analgesic properties
- 3) Intrathecal epinephrine has analgesic properties
- 4) Addition of epinephrine to epidural local anesthetics decreases the incidence of hypotension

A if 1,2 and 3 are correct
B if 1 and 3
C if 2 and 4
D if 4
E if all

269. A 79 year old man with presents with a fractured forearm after suffering a fall. Regional anesthesia is chosen due to underlying multiple medical co-morbidities. While performing a supraclavicular brachial plexus block, the patient begins to cough and complain of chest pain and SOB. The most likely diagnosis is:

- a) IV injection of local anesthetic
- b) Phrenic nerve irritation
- c) Angina
- d) Pneumothorax
- e) Intrathecal injection of local anesthetic

270. The most common complication associated with a supraclavicular block is

- a) Blockade of the recurrent laryngeal nerve
- b) Pneumothorax
- c) IV injection into the vertebral artery
- d) Blockade of the phrenic nerve
- e) Spinal blockade

271. Which portion of the brachial plexus is blocked with a supraclavicular block?

- a) Branches
- b) Roots
- c) Trunks**

- d) Cords
 - e) Divisions
272. Which of the following is the most common complication with supraclavicular blocks?
- a) Pneumothorax
 - b) phrenic nerve palsy
 - c) bleeding
 - d) horner's syndrome
273. Supraclavicular brachial plexus block acts at what level?
- a) Roots
 - b) Trunks
 - c) Divisions
 - d) Cords
 - e) peripheral nerves
274. What is true regarding a supraclavicular brachial plexus block?
- a) The ulnar nerve may not be blocked by this technique.
 - b) 15 mL of 2% lidocaine will provide an adequate block.
 - c) This block will be adequate if a tourniquet is used on the upper arm.
 - d) Blocks the trunks as they cross the axillary artery
275. Which one of the following is true regarding supraclavicular BPB?
- a) The subclavian artery is anterior to the brachial plexus.
 - b) The brachial plexus is posterior to the first rib.
 - c) The subclavian vein is posterior to the anterior scalene.
 - d) It is performed at level of C3
276. Which of the following statements concerning the trigeminal nerve is TRUE?
- a) It is a sensory nerve innervating the face
 - b) There are 4 major branches of the trigeminal nerve exiting from the skull
 - c) The mandibular nerve is the largest branch and the only one to receive motor fibers
 - d) Most anesthetic applications of this nerves blockade can be performed by injection of the main branches of the nerve.
 - e) The frontal branch bifurcates into the auricular and supraorbital nerves.
277. What is true concerning the trigeminal nerve?
- a) The ophthalmic division supplies the lower eyelid.
 - b) The maxillary division supplies the tip of the nose.
 - c) The trigeminal ganglion is situated lateral to the external carotid artery.
 - d) It carries secretomotor fibers.
 - e) The mandibular branch has the only motor fibers.
278. Which of the following statements about Tic Doloieux is true?
- a) Symptoms occur predominantly in the first and second mandibular divisions (V₁ and V₂).

- b) Hemi-facial flushing.
 - c) Immediate response to carbamazepine.
 - d) Described as burning pain.
 - e) It is treated well with opioids.
 - f) Absent ipsilateral corneal reflex.
279. All are beneficial in treating post-herpetic neuralgia, EXCEPT?
- a) Intrathecal Methylprednisolone
 - b) Opioids
 - c) TCA's
 - d) NSAID's
280. Which of the following drugs is LEAST useful in treating post-herpetic neuralgia:
- a) Ibuprofen
 - b) Morphine
 - c) Amitriptyline
 - d) Epidural methylprednisolone
281. All of the following are true regarding post herpetic neuralgia, EXCEPT?
- a) Shingles in the elderly have a 25% chance of causing pain.
 - b) It most commonly affects the thoracic dermatomes.
 - c) The causative agent is varicella zoster virus.
 - d) Sympathetic nerve blocks can attenuate severity.
282. The following are true concerning post-herpetic neuralgia, EXCEPT?
- a) Initial lesion caused by herpes Zoster.
 - b) Usually affects thoracic dermatomes.
 - c) If age is greater than 70 years then there is a 25% chance of post-herpetic neuralgia after shingles.
 - d) Local sympathetic block reduces the incidence.
 - e) Narcotics are the mainstay of treatment.
283. f the following are true regarding post herpetic neuralgia, EXCEPT?
- a) It is caused by herpes zoster.
 - b) Occurs mostly in the truncal regions.
 - c) Greater than 25% of elderly patients develop post herpetic neuralgia.
 - d) Local sympathetic blocks decrease the frequency of post herpetic neuralgias.
284. What is the best therapy for post-herpetic neuralgia?
- a) Intercostal nerve blockade.
 - b) X Tricyclic antidepressants.
 - c) NSAIDs.
 - d) Narcotics.
285. Post herpetic neuralgia...all true except:

- a) Secondary to herpes zoster
- b) age over 70, 25% incidence of PHN
- c) narcotics are not the mainstay of treatment
- d) usually thoracic dermatomes
- e) early sympathetic block with local anesthetics will decrease incidence of PHN.

286. Which of the following statements regarding the stellate ganglion is/are TRUE?

- 1) Blockade of this ganglion results in parasympathetic blockade of the upper extremity and head.
- 2) The ganglion is a large fusion of the first thoracic sympathetic ganglion, with the lowest cervical ganglion on each side.
- 3) It lies lateral to the body of C6.
- 4) Chassaignac tubercle is a landmark identified during the blockade of this ganglion.

- A if 1,2 and 3 are correct
- B if 1 and 3
- C if 2 and 4
- D if 4
- E if all

287. Which of the following is/are signs of a stellate ganglion blockade?

- 1) Sweaty appearance
- 2) Ptosis
- 3) Vasoconstriction
- 4) Constricted pupils

- A if 1,2 and 3 are correct
- B if 1 and 3
- C if 2 and 4
- D if 4
- E if all

288. Potential complications of a stellate ganglion block include

- 1) Subarachnoid block
- 2) Brachial plexus block
- 3) Pneumothorax
- 4) Superior laryngeal nerve paralysis

- A if 1,2 and 3 are correct
- B if 1 and 3
- C if 2 and 4
- D if 4
- E if all

289. All of the following statements concerning cervical plexus blockade are true EXCEPT:

- a) The cervical plexus consists solely of nerve fibers from C1 and C2.
 - b) Blockade of the cervical plexus may involve only sensory nerves because of the separation of motor and sensory fibers early in their course.
 - c) Carotid endarterectomy may be performed under cervical plexus blockade.
 - d) Blockade of this plexus may provide adequate anesthesia for thyroid surgery or carotid endarterectomy.
 - e) Paresthesias usually are not necessary to perform adequate blockade of the cervical plexus.
290. Properly performed cervical plexus blockade may result in all of the following EXCEPT:
- a) Intravascular injection of local anesthetic with rapid onset of seizures
 - b) Phrenic nerve paralysis
 - c) Recurrent laryngeal nerve blockade
 - d) Epidural or subarachnoid anesthesia
 - e) Ipsilateral pneumothorax
291. A 36 year old female is undergoing thyroidectomy under a deep cervical plexus nerve block. Which of the following complications would be LEAST likely with this block?
- a) Horner's syndrome
 - b) Subarachnoid injection
 - c) Blockade of the recurrent laryngeal nerve
 - d) Blockade of the spinal accessory nerve
 - e) Blockade of the phrenic nerve
292. 4 days after a left THA, an obese 62 year old woman complains of sever back pain in the region where the epidural was placed. Over the ensuing 48 hours, the back pain gradually worsens and a severe aching pain that radiates down the left leg to the knee develops. The most likely diagnosis is
- a) Epidural abscess
 - b) Epidural hematoma
 - c) Anterior spinal artery syndrome
 - d) Arachnoiditis
 - e) Meralgia paresthetica
293. During placement of an epidural in a 78 year old patient scheduled for a TKA, the patient complains of a sharp, sustained pain radiating down his left leg as the catheter is inserted to 2 cm. The most appropriate action at this time would be:
- a) Leave the catheter at 2 cm, give test dose
 - b) Give small dose to relieve pain then advance 1 cm
 - c) Withdraw the catheter 1 cm, give test dose
 - d) Withdraw needle and catheter, re-insert in a new position
 - e) Abandon epidural technique, place long-acting spinal anesthetic
294. Differences in which of the following local anesthetic properties accounts for the fact that the onset of an epidural block with 3% 2-chloroprocaine is more rapid than 2% lidocaine?
- a) Protein binding

- b) pKa
- c) Lipid solubility
- d) Concentration
- e) Ester versus amide structure

295. Epidural use of which of the following opioids would result in the greatest incidence of delayed respiratory depression?

- a) Sufentanil
- b) Fentanyl
- c) Morphine
- d) Hydromorphone
- e) Meperidine

296. Which of the following would hasten the onset and increase the clinical duration of action of a local anesthetic, and provide the greatest depth of motor and sensory blockade when used for epidural anesthesia?

- a) Addition of 1:200,000 epinephrine
- b) Increasing the volume of local anesthetic
- c) Increasing the concentration of local anesthetic
- d) Increasing the dose
- e) Placing the patient in head-down position

297. The addition of epinephrine to epidural bupivacaine will

- a) Prolong motor blockade only
- b) Prolong sensory blockade only
- c) Prolong motor and sensory blockade
- d) Shorten duration of sensory blockade
- e) Have no effect on either duration of motor or sensory blockade

298. Epidural administration of a chloroprocaine/bupivacaine mixture would have:

- a) A latency similar to chloroprocaine with a duration of action similar to bupivacaine
- b) A latency shorter than chloroprocaine with a duration of action longer than bupivacaine
- c) A latency shorter than chloroprocaine with a duration of action similar to bupivacaine
- d) A latency longer than chloroprocaine with a duration of action similar to chloroprocaine
- e) A latency longer than chloroprocaine with a duration of action shorter than bupivacaine

299. The duration of epidural anesthesia is affected by

- a) Height of patient
- b) Age of patient
- c) Weight of patient
- d) Addition of epinephrine (1:200,000) to the local anesthetic

300. How much local anesthetic should be administered per spinal segment to patients between 20 and 40 years of age receiving epidural anesthesia?

- a) 0.5 mls

- b) 1 ml
- c) 1.5 mls
- d) 2 mls
- e) 2.5 mls

301. All of the following concerning peripheral nerve blockade are true EXCEPT:

- a) Complaints of a “cramping” or “aching” sensation during injection may indicate intraneural injection
- b) Use of a nerve stimulator with a variable amperage output and an insulated needle requires familiarity with anatomy
- c) Obtaining a sensory parasthesia is an acceptable technique
- d) Aspiration of blood or proximity of nerves to bones makes localization simpler
- e) Ultrasound guidance to localize nerves is a simple technique to master

302. All of the following statements are true EXCEPT:

- a) Toxicity from local anesthesia can occur 20-30 minutes following injection
- b) CNS excitation is a common hazard associated with high levels of local anesthetic
- c) Local anesthetic toxicity is first manifested by hypertension and tachycardia
- d) Contraindications to neuraxial blockade are infection at the site of injection and severe coagulopathy
- e) Local anesthetic-induced myocardial depression may be manifested by bradycardia.

303. Which of the following statements regarding sensory innervation of the airway is FALSE?

- a) The nasal mucosa is innervated by fibers of the sphenopalatine ganglion
- b) The mucosa above the vocal cords is innervated by the superior laryngeal branch of the vagus nerve
- c) The mucosa below the vocal cords is innervated by the recurrent laryngeal branch of the vagus nerve
- d) The vocal cords are innervated by the trigeminal nerve
- e) The oral pharynx and supraglottic regions are innervated by the glossopharyngeal nerve.

304. The deep peroneal nerve innervates the:

- a) Lateral spect of the dorsum of the foot
- b) Entire dorsum of the foot
- c) Web space between the great toe and the second toe
- d) Web space between the third and fourth toes
- e) Medial aspect of the dorsum of the foot

305. The stellate ganglion lies in closest proximity to which of the following vascular structures?

- a) Common carotid artery
- b) Internal carotid artery
- c) Vertebral artery
- d) Axillary artery
- e) Aorta

306. Which of the following structures in the antecubital fossa is the most medial?
- a) Brachial artery
 - b) Cephalic vein
 - c) Tendon of the biceps
 - d) Median nerve
 - e) Musculocutaneous nerve
307. Cutaneous innervation of the plantar surface of the foot is provided by the
- a) Sural nerve
 - b) Posterior tibial nerve
 - c) Saphenous nerve
 - d) Deep peroneal nerve
 - e) Superficial peroneal nerve
308. Which of the following types of regional anesthesia is associated with the greatest serum concentration of lidocaine?
- a) Intercostal
 - b) Caudal
 - c) Epidural
 - d) Brachial plexus
 - e) Femoral nerve block
309. Which of the following nerves is located immediately lateral to the trachea?
- a) Vagus
 - b) Recurrent laryngeal
 - c) Phrenic
 - d) Long thoracic
 - e) Spinal accessory
310. If a needle is introduced 2 cm inferior and lateral to the pubic tubercle, to which nerve will it lie in close proximity?
- a) Obturator nerve
 - b) Femoral nerve
 - c) Lateral femoral cutaneous nerve
 - d) Sciatic nerve
 - e) Ilioinguinal nerve
 - f) (Hall & Chantigian, pg 342)
311. Which portion of the upper extremity is not innervated by the brachial plexus?
- a) Posterior medial portion of the arm
 - b) Elbow
 - c) Lateral portion of the forearm
 - d) Medial portion of the forearm
 - e) Anterolateral portion of the arm

312. Para-aminobenzoic acid is a metabolite of:
- Mepivacaine
 - Benzocaine
 - Bupivacaine
 - Tetracaine
313. TRUE statements concerning peripheral nerve structure and function include which of the following?
- Both nonmyelinated and myelinated nerves are surrounded by Schwann cells
 - The speed of propagation of an action potential along a nerve axon is greatly enhanced by myelin
 - Generation of an action potential is an “all-or-none” phenomenon
 - Propagation of an action potential along myelinated nerve axons occurs by saltatory conduction via the nodes of Ranvier
314. The seizure threshold for local anesthetics is raised by
- Hypokalemia
 - Hyperoxia
 - Hypocarbica
 - Acidosis
315. Factors that determine the proportion of local anesthetic that exists in the un-ionized (freebase) and ionized (cation) forms include
- Local anesthetic concentration
 - Tissue pH
 - Local anesthetic volume
 - pKa of the local anesthetic
316. True statements concerning the metabolism of local anesthetics include which of the following?
- Plasma clearance of ester-type local anesthetics is decreased in patients who are homozygous for atypical pseudocholinesterase
 - Plasma clearance of ester-type local anesthetics is decreased in patients with severe cirrhotic liver disease
 - Plasma clearance of amide-type local anesthetics is decreased in patients with severe cirrhotic liver disease
 - Plasma clearance of amide-type local anesthetics is decreased in patients with severe renal insufficiency
317. Local anesthetics metabolized by ester hydrolysis include
- Lidocaine
 - Cocaine
 - Mepivacaine

- d) Tetracaine
318. Which of the following local anesthetic concentrations is/are hypobaric?
- a) 2% lidocaine
 - b) 0.5% tetracaine
 - c) 0.5% bupivacaine
 - d) 0.75% bupivacaine
319. Epinephrine is effective in increasing the clinical duration of action of
- a) Procaine
 - b) Lidocaine
 - c) tetracaine
 - d) Etidocaine
320. Which of the following observations, after nerve injury, is correctly paired with the appropriate nerve?
- a) Inability to flex the forearm—radial nerve
 - b) Numbness in the index finger—median nerve
 - c) Inability to extend the forearm—musculocutaneous nerve
 - d) Numbness in the little finger—ulnar nerve
321. Factors that antagonize local anesthetics include:
- a) Tissue acidosis
 - b) Presence of myelin
 - c) Increasing fiber diameter
 - d) Rapid firing rate
322. Factors that influence systemic absorption of local anesthetics include
- a) Site of injection of the local anesthetic
 - b) Lipid solubility of the local anesthetic
 - c) Addition of vasoconstrictor substances to the local anesthetic
 - d) Concentration of the local anesthetic
323. Duration of action of local anesthetics may be increased by
- a) Adding vasoconstrictors
 - b) Adding bicarbonate
 - c) Increasing the dose
 - d) Use of carbonated solutions
324. Which of the following is associated with decreased clearance of ester-type local anesthetics?
- a) Cirrhotic liver disease
 - b) Pregnancy
 - c) Renal insufficiency
 - d) Severe COPD

325. Nerves that originate from the sacral plexus include
- Femoral nerve
 - Obturator nerve
 - Lateral femoral cutaneous nerve
 - Sciatic nerve
326. Drugs that will decrease the plasma clearance of ester-type local anesthetics include
- Ecothiophate
 - N₂O
 - Neostigmine
 - Phenytoin
327. In order to perform surgery on the knee, which of the following nerves should be blocked?
- Femoral nerve
 - Sciatic nerve
 - Lateral femoral cutaneous nerve
 - Obturator nerve
328. Which of the following drugs will decrease the plasma clearance of amide-type local anesthetics?
- Propranolol
 - Cimetidine
 - Halothane
 - Phenytoin
329. Choose all items that correctly pair local anesthetics with their maximum dose for infiltration when administered without a vasoconstrictor to a 70 kg adult
- Lidocaine, 300 mg
 - 2-Chloroprocaine, 800 mg
 - Mepivacaine, 460 mg
 - Bupivacaine, 225 mg
330. True statements concerning local anesthetics include which of the following?
- The un-ionized form of a local anesthetic binds to the nerve membrane to actually block conduction
 - If one node of Ranvier is blocked, conduction will be reliably interrupted
 - The ability of a local anesthetic to block nerve conduction is directly proportional to the diameter of the fiber
 - The presence of myelin enhances the ability of a local anesthetic to block nerve conduction
331. Medium diameter; efferent to muscle spindles
Small diameter; preganglionic autonomic function

Large diameter; fast conduction; motor function

Medium diameter; pain; temperature; touch

Small diameter; postganglionic autonomic function and pain; temperature; touch

Large diameter; proprioception

- a) Type A- α fibers
- b) Type A- β
- c) Type A- γ
- d) Type A- δ
- e) Type B fibers
- f) Type C fibers

332. Which of the following statements concerning acid/base balance is FALSE?

- a) The pKa of an acid is inversely proportional to the pH.
- b) The closer the pKa is to the ambient pH, the greater the change in the degree of ionization for a given change in pH
- c) The non-ionized fraction of weak acids, such as salicylates, is greater at low pH values
- d) The non-ionized fraction of opioids increases as the pH increases above the drug's pKa
- e) The non-ionized fraction of local anesthetics increases as the pH increases above the drug's pKa.

333. Which of the following statements regarding ilioinguinal/iliohypogastric nerve block is/are TRUE?

- a) Anesthesia of the iliohypogastric nerve and ilioinguinal nerve is adequate for hernia repair.
- b) The nerve roots from T12, L1 and L2 provide fibers to these 2 nerves.
- c) The anteroinferior iliac spine provides the landmark for location of these 2 nerves
- d) Hematoma formation is a rare complication of this nerve block.

334. Blockade of T6-T12 results in which of the following?

- a) It provides analgesia and motor relaxation for upper abdominal procedures.
- b) It is useful in reducing pain associated with chest tube insertion or percutaneous biliary drainage procedures.
- c) It has potential for local anesthetic toxicity, especially if performed bilaterally.
- d) There is a high incidence of pneumothorax even when the anesthetic is performed by an experienced individual.
- e) (Review of Clinical Anesthesia, pg 132)

335. What is the correct order of structures (from cephalad to caudad) in the intercostals space?

- a) Nerve, artery, vein
- b) Vein, nerve, artery
- c) Vein, artery, nerve
- d) Artery, nerve, vein
- e) Artery, vein, nerve

336. When using nerve stimulation to aid nerve identification, the initial current settings are relatively high (1-2ma); this is then decreased to 0.3-0.5 ma, if a weak twitch is still observed, injection of LA is usually commenced. If a strong twitch response is observed at less than 0.3, LA is not injected the needle is usually repositioned. Why? Choose one of the following:

- a) large motor fibers require lower current amplitude to produce a twitch response
- b) potential intravascular placement is ruled out
- c) twitch observed at very low settings may indicate intraneural placement of the needle tip
- d) the patient may experience discomfort at high current amplitude

337. The pulse width most commonly utilized for nerve localization is:

- a) 100-200 microseconds
- b) 300-1 millisecond
- c) 50-100 microseconds
- d) 1-2 milliseconds

338. Which one of the following statements is correct regarding the polarity of stimulating and returning electrodes?

- a) the cathode is usually attached to the stimulating needle, the anode to the patient's skin
- b) negative current from the anode causes depolarization and an action potential
- c) when using a constant output nerve stimulator, the distance between the anode and cathode is particularly important
- d) preferential cathode stimulation refers to the significantly increased current required to elicit a motor response

339. The use of non-conducting injectates (5% Dextrose) during nerve localization:

- a) decreases current density at the needle tip thereby decreasing direct neural injury
- b) increases electrical resistance and improves twitch response
- c) identifies accurately the needle tip during ultrasound guided blocks
- d) increases current density at the needle tip, resulting in maintenance of the motor response at low current

340. Pulse width:

- a) should be shorter than 100 microsec to stimulate sensory fibers
- b) affects the advancement rate of the needle
- c) should be longer than 400microsec to stimulate sensory fibers
- d) variability can decrease sensitivity without compromising specificity of nerve location

341. High frequency probes can be utilized:
- to visualize deep structures
 - to visualize superficial structures
 - to provide better signal to noise ratio
 - to produce good contour definitions between tissues
342. The amplifier gain function:
- compensates for the decreasing amplitude of the ultrasound with time
 - increases the amplitude of weak echoes to improve signal to noise ratio
 - does not affect image quality and contrast sensitivity
 - is to reduce artifact
343. The Doppler Effect:
- is a phenomenon where the emitting receptor detects the frequency of reflected ultrasound waves, and compares it with the emitted frequency
 - enables nerve structures to be positively identified
 - must be demonstrated before attempting Supraclavicular Brachial Plexus block
 - is an important cause of artifact
344. Which one of the following statements is correct regarding the ultrasound appearance of different tissues?
- bone is predominantly hyperechoic
 - muscle has a “starry night” appearance on long axis scanning
 - vascular structures are hyperechoic
 - fat is generally hyperechoic
345. Which one of the following statements regarding anisotropy and acoustic shadowing is correct?
- anisotropy is the sole cause of artifact production
 - anisotropy results from total lack of ultrasound beam reflection
 - acoustic shadows occur frequently in areas where the ultrasound beam is poorly reflected
 - in the inguinal region a 10 degree tilt of the transducer may alleviate the effect of acoustic shadows
346. Which one of the following statements is correct regarding concerning transducers?
- linear transducers do not produce the same uniform image in both the near and far fields
 - convex transducers produce a larger image field
 - phased array transducers are most suitable for regional anesthesia in areas of superficial target nerve structures
 - linear transducers provide good quality images in compact areas such as the supraclavicular area where artifact and anisotropy are common
347. Which of the following statements is true concerning wave frequency and tissue penetration?

- a. high frequency probes allow high spatial resolution, and increased depth of penetration
 - b. low frequency probes allow greater depth but less resolution
 - c. for superficial tissues optimal frequencies are between 2-7MHz
 - d. for deep structures optimal frequencies are between 7.5-15MHz
348. Regarding needle visibility during ultrasound guided blocks:
- a. small bore needles (22ga) allow for greater visibility in deep locations or in patients with increased BMI
 - b. jiggling the needle during trajectory improves visibility and is an absolutely safe technique
 - c. measuring nerve depth by ultrasound and correlating this depth to a calculated needle depth is a safe reliable technique
 - d. echogenic needles are widely available currently and insulated for nerve stimulation confirmation
349. To best visualize deep structures such as the gluteal region, one of the following statements is correct:
- a. a high frequency curved probe should be used
 - b. a low frequency transducer gives greater penetration
 - c. a linear probe is not suitable
 - d. a high frequency linear array transducer is most appropriate
350. The Traceback method:
- a. utilizes initial identification of obvious anatomical landmarks to aid nerve identification
 - b. relies solely upon the presence of large vascular structures
 - c) is unreliable in the popliteal region due to increased acoustic shadowing
 - d) can only be employed with convex transducers
351. Techniques to improve needle visibility include:
- a. use of smaller bored needles
 - b. facing the bevel at right angles to the ultrasound beam
 - c. roughening the surface of the needle to add acoustic variation
 - d. injecting the entire dose of local anesthetic agent
352. Regarding the Walk Down Approach:
- a. needle tip image can be improved by using steep initial puncture angles
 - b. the nerve structure is often placed centrally on the screen to guarantee that aligning the puncture with the centre of the probe will ensure needle-tip – nerve alignment
 - c. it is employed to improve block success when using the In-plane approach
 - d. it is easiest to follow the needle trajectory when using a curved probe
353. Regarding the choice of local anesthetic agent:
- a. for Outpatient cases 30mls of 0.5% bupivacaine results in onset time less than 10 min, and block duration of less than 2 hours

- b. adrenaline addition to LA is beneficial to ultrasound guided blocks in slowing the speed of onset and duration of block
 - c. for inpatient cases a 2% lidocaine and 1% ropivacaine mixture can give an analgesic effect for up to 18 hrs
 - d. Prilocaine 6mg/kg is safest for day surgery cases
354. Concerning the compressed air injection technique:
- a. it is based on studies that show persistent motor deficits occur when injection pressures are less than 760 mmHg
 - b. it involves introducing a set amount of air above a volume of injectate, with compression and maintenance of this volume during injection to maintain the pressure at a chosen level
 - c. the pressure is determined by Dalton's Law
 - d. air embolism is not a risk of the technique
355. The brachial plexus:
- a. is comprised of the anterior rami of spinal nerves C3 to T3
 - b. consists of 5 Roots, 3 Trunks and 3 Cords
 - c. the trunks emerge between the scalenus anterior and posterior muscles
 - d. at the lateral border of the 1st Rib each trunk bifurcates into anterior and posterior cords
356. Regarding brachial plexus anatomy:
- a. the nerve to longus colli and scalene muscles C5-C8 is part of the brachial plexus
 - b. the lateral cord branches to form the Ulnar nerve
 - c. the musculocutaneous nerve has roots C5-C7
 - d. the radial nerve is a branch of the medial cord
357. Regarding the motor response observed when stimulating the brachial plexus:
- Part 1
- a) arm abduction is a musculocutaneous nerve response
 - b) elbow flexion is a radial nerve response
 - c) forearm pronation and wrist flexion is a median nerve response
 - d) shoulder shrug is a radial nerve response
- Part 2
- a) thumb flexion and opposition is a median nerve response
 - b) little finger extension and adduction is an ulnar nerve response
 - c) thumb extension and opposition is an anterior interosseous nerve response
 - d) elbow extension is a musculocutaneous nerve response
358. Regarding cutaneous innervation of the upper extremity:
- a. C8 supplies the hand and middle 3 fingers
 - b. T1 supplies the medial side of the lower arm and upper forearm
 - c. C3 and C4 supply the suprascapular region
 - d. C6 supplies the medial forearm and the thumb
359. Concerning correct segmental motor response to nerve stimulation:

- a. C5 produces medial rotation and adduction of the shoulder
 - b. C6 flexion and extension of the forearm
 - c. C5 and C6 elbow flexion
 - d. T1 all movements of the thumb
360. Concerning muscular distribution of spinal nerves, which is matched correctly?
- a. C5 bicep
 - b. C6 flexor pollicis longus
 - c. C7 triceps
 - d. C8 deltoid
361. Concerning joint innervation and motor response to nerve stimulation, which is matched correctly?
- a. shoulder- suprascapular nerve, arm adduction
 - b. anterior Elbow- median nerve, elbow extension
 - c. wrist- radial nerve, extension of elbow, wrist and fingers
 - d. wrist- median nerve, little finger extension and adduction
362. Concerning the brachial plexus, all are true, except:
- a. the scalenus anterior and medius muscles lie immediately anterior and posterior to the plexus in the interscalene region.
 - b. the upper, middle and lower trunks are enclosed within the interscalene fascial sheath as they emerge between the scalene muscles
 - c. the trunks may be crossed by the subclavian vein and transverse cervical and suprascapular arteries
 - d. above and at the level of C6 the plexus lies posterolateral and deep to the internal jugular vein and common carotid vessels
363. Regarding the sonographic appearance of the brachial plexus in the supraclavicular fossa. All are true except:
- a. the subclavian artery is anechoic, hypodense, pulsatile and round
 - b. the trunks/divisions of the plexus can be found superolateral to the subclavian artery
 - c. the 1st rib which lies lateral and superficial to the artery, often appears as a hyperechoic linear structure, with a hypoechoic shadow underneath
 - d. inferomedial to the subclavian artery, the anechoic large, oval to round subclavian vein is sometimes seen
364. Regarding the needling technique for supraclavicular block, all the following are true except:
- a. the IP approach facilitates clear visualization of the needle, which is important to avoid inadvertent pleural puncture
 - b. the IP approach with lateral to medial needle insertion, will ensure the needle approaches the nerve structures prior to the subclavian artery
 - c. a drawback to this technique is that it aims towards the thorax and there is real potential for pleural puncture
 - d. if nerve structures are not clearly visible in the coronal oblique plane, continue advancing the needle until stimulation is achieved

365. Which of the following statements is correct?
- stimulation of the diaphragm suggests the needle plane is too posterior
 - vascular puncture suggests the needle tip is posterior to the plexus
 - if bone is encountered at 3cm, it is likely the 1st rib has been contacted
 - twitching over the scapula suggests the needle tip is too anteromedial
366. Which statement/s correctly identifies the requirements for surgical anesthesia at various sites on the upper limb?
- supraclavicular Block produces total motor and sensory anesthesia for shoulder surgery
 - anesthesia of the lower trunk is required for hand surgery, therefore local anesthetic should be deposited next to the inferior portion of the nerve cluster
 - local anesthesia in injection in the superior portion of the nerve cluster achieves satisfactory anesthesia in the arm
 - the axillary approach to the plexus is the only reliable technique for hand surgery
367. Supraclavicular brachial plexus blocks are performed at which level?
- trunks/divisions
 - roots/divisions
 - CORDS
 - roots
368. Regarding brachial plexus blocks:
- intra-neural needle position is suspected if the stimulating current is greater than 1 milliamp
 - the infraclavicular approach does not carry the risk of pneumothorax
 - if the axillary approach is used there is no need to block the intercostobrachial nerve, if a tourniquet is required
 - the musculocutaneous nerve can be blocked by injection of local anesthetic into the coracobrachialis muscle
369. Which one of the following statements is true regarding brachial plexus anatomy?
- it is situated behind the middle interscalene muscle
 - the plexus lies in front of the subclavian artery
 - it does not innervate the latissimus dorsi
 - it arises from the anterior primary rami of roots C5-C8,T1
370. You receive a call from a patient, who had an interscalene block performed 24 hrs ago for shoulder surgery. He complains of inability to abduct the shoulder and decreased sensation from shoulder to elbow. Which nerve/s could have been injured?
- posterior cord of the brachial plexus
 - suprascapular nerve
 - musculocutaneous nerve
 - radial nerve

371. The femoral nerve:
- comprises nerve roots T12-L4
 - courses between the psoas major and iliacus muscles, deep to the fascia iliaca
 - at the inguinal ligament the nerve lies slightly superficial and medial to the femoral artery
 - at the femoral crease the nerve lies above the fascia iliaca, and deep to the fascia lata
372. Regarding anatomy and elicited motor responses of the femoral and related nerves in the inguinal region:
- blockade of the femoral nerve produces surgical anesthesia for all operations in the anterior thigh and knee
 - the accepted motor response to nerve stimulation during femoral block is ipsilateral sartorius muscle contraction
 - the obturator and lateral femoral cutaneous nerves are consistently blocked by anesthetic injection into the femoral nerve sheath
 - the saphenous nerve is the terminal branch of the femoral nerve, and innervates the skin over the medial aspect of the thigh
373. Concerning nerve stimulator guided femoral nerve block, all are true except:
- at the inguinal ligament and just distal to it, the nerve lies slightly deeper and lateral to the femoral artery, the femoral vein is medial to the artery
 - the correct stimulation response of the femoral nerve is patellar twitch and knee extension
 - sartorius twitch suggests the needle is too superficial
 - the nerve lies superficial to the sartorius and iliacus muscles
374. Regarding the sonographic appearance of the femoral nerve and relations:
- The nerve lies about 1cm lateral and deep to the large, circular anechoic femoral artery
 - The fascia iliaca (most superficial) and lata (immediately above the nerve), may be seen superficial to the femoral nerve
 - The femoral nerve often appears elliptical in shape, early division above the inguinal ligament can decrease the transverse diameter of the nerve
 - In obese patients it is recommended that Doppler is used to identify the femoral artery and ensure the block location is distal to the profunda femoris
375. Regarding optimal nerve stimulation response for femoral nerve block:
- if twitches of the Sartorius muscle occur, the needle may be outside the nerve sheath, and one may be stimulating the obturator nerve
 - the most reliable response is a visible or palpable ipsilateral quadriceps twitch at 0.3-0.5Ma
 - optimal motor response of the femoral nerve, may include knee flexion
 - the lateral femoral cutaneous nerve if stimulated produces thigh abduction
376. Regarding regional block for knee arthroscopy, which of the following nerve/s should be blocked?

- a. sural
 - b. femoral
 - c. lateral cutaneous femoral
 - d. tibial nerve
377. Which statement is false concerning anesthesia for hip surgery?
- a. a lumbar plexus block will provide total surgical anesthesia
 - b. a femoral nerve block will provide adequate analgesia, requiring smaller doses of narcotic postoperatively than if done under GA
 - c. complete analgesia/anesthesia is best obtained with either spinal or epidural technique
 - d. the hip joint is innervated by femoral, obturator, sciatic and superior gluteal nerves.
378. Which statement is false concerning the sciatic nerve?
- a. it comprises nerve roots L4/L5, S1-S3
 - b. it leaves the pelvis through the greater sciatic foramen below the piriformis, and descends medial to the midpoint of a line between the greater trochanter and the ischial tuberosity
 - c. is accompanied laterally by the posterior femoral cutaneous nerve
 - d. proximally the nerve lies deep to the gluteus maximus
379. Which of the following statements is false regarding the sciatic nerve?
- a. divides into the tibial nerve medially and common peroneal laterally near the apex of the popliteal fossa
 - b. has its own artery which lies on the anterior aspect of the nerve and lies outside the fibrous sheath surrounding the nerve
 - c. anteriorly, lies at the back of the ischium on the piriformis muscle
 - d. supplies all of the adductor muscles
380. Which statement is false concerning the tibial nerve?
- a. it comprises nerve roots L4 L5 S1-S3
 - b. it is covered medially by the semitendinosus and semimembranosus muscles, laterally by the biceps femoris
 - c. in the popliteal fossa courses lateral to the popliteal vessels becoming superficial to them at the knee
 - d. gives muscular branches to the semi-membranosus and semi-tendinosus muscles
381. Which statement is false concerning the common peroneal nerve?
- a. is palpable along the lateral aspect of the fibular neck
 - b. gives articular branches to the knee
 - c. is about 1/2 the size of the tibial nerve
 - d. supplies the cutaneous region over the medial condyle of the tibia
382. Which of the following statements is false regarding the deep peroneal nerve?
- a. has motor branches to muscles in the anterior compartment of the leg

- b. provides sensory branches that supply the web of skin between the 2nd and 3rd toes
 - c. provides sensory branches to the ankle joint capsule
 - d. has motor branches to the extensor digitorum brevis, the only muscle on the dorsum of the foot
383. Which of the following statements is false regarding the superficial peroneal nerve?
- a. supplies the peroneus longus
 - b. supplies the peroneus brevis
 - c. supplies the skin on the medial aspect of the lower half of the leg
 - d. supplies the skin on the dorsum of the foot
384. Which statement is false concerning nerve stimulation responses of the sciatic and related nerves?
- a. knee flexion, foot inversion and plantar flexion is a tibial response
 - b. ankle dorsiflexion is a deep peroneal response
 - c. foot eversion is a superficial peroneal response
 - d. plantar flexion is a deep peroneal response
385. Which statement is false regarding the trace back technique to successful popliteal sciatic block?
- a. with the probe at the base of the popliteal fossa, the tibial nerve is seen in the midline, superficial and lateral to the popliteal vessels
 - b. by tracing proximally the sciatic nerve can be located, usually within 10cm of the popliteal crease
 - c. the ultrasound image changes from the distinct lateral common peroneal and medial tibial to form one bilobular structure
 - d. the popliteal artery is easily identified at the location where the 2 nerves merge to form the sciatic nerve
386. Which statement is false concerning needling techniques for popliteal sciatic block?
- a. both IP and OOP approaches are appropriate
 - b. the OOP is beneficial for catheter insertion
 - c. with the OOP approach the “walk down” technique, brings the needle to the target, with ability to constantly track the needle tip
 - d. a single placement of LA above the nerve is sufficient for complete surgical anesthesia
387. Which statement is false concerning anesthesia for ankle surgery?
- a. a popliteal sciatic nerve block is often adequate if a thigh tourniquet is required
 - b. saphenous nerve block + popliteal block will anesthetize sufficiently for bimalleolar surgery (without tourniquet)
 - c. the sural nerve can be blocked just behind the lateral malleolus
 - d. the sole of the foot is reliably anesthetized by tibial nerve block
388. Which one of the following nerves should be blocked in conjunction with the sciatic nerve for ankle surgery?

- a. saphenous
- b. sural
- c. superficial and deep peroneal
- d. posterior tibial