

NEET MDS Oral and Maxillofacial Surgery Sample Paper – 4

Duration: 90 Minutes**Questions: 100****Max Marks: 400**

- Q1.** On CBCT assessment of a mandibular third molar, which radiographic sign most reliably indicates that the inferior alveolar nerve canal passes through the root of the tooth?
- (A) Darkening of the root on panoramic radiograph
 - (B) Interruption of the cortical white line of the canal on CBCT axial cuts
 - (C) Diversion of the canal around the apex
 - (D) Narrowing of the root at the level of the canal
- Q2.** A patient undergoing removal of a mandibular third molar develops immediate numbness of the lower lip and chin after the procedure. The nerve most likely injured is the:
- (A) Lingual nerve
 - (B) Inferior alveolar nerve
 - (C) Buccal nerve
 - (D) Mental nerve
- Q3.** Which of the following Pell-Gregory classes of mandibular third molar impaction is most strongly associated with the recommendation for prophylactic surgical removal due to the highest risk of complications?
- (A) Class I Position A
 - (B) Class II Position B
 - (C) Class I Position B
 - (D) Class III Position C
- Q4.** During removal of a mandibular third molar, lingual nerve injury is MOST commonly caused by:
- (A) Excessive lingual retraction with a periosteal elevator during bone removal
 - (B) Improperly placed inferior alveolar nerve block
 - (C) Deep placement of the bur on the buccal surface
 - (D) Failure to decompress the tooth with a distal wedge incision
- Q5.** A patient presents with recurrent pericoronitis of the mandibular left third molar. The second molar has 6 mm probing depths distally. The most appropriate management is:
- (A) Operculectomy alone



- (B) Extraction of the third molar followed by periodontal review of the second molar
- (C) Antibiotic therapy and oral hygiene instruction only
- (D) Root planing of the second molar without removing the third molar

Q6. Regarding the debate on third molars and dental crowding, the most evidence-based statement is:

- (A) Third molars are the primary cause of late lower incisor crowding
- (B) Third molars are not a proven independent cause of anterior dental crowding
- (C) Extraction of third molars reliably prevents post-orthodontic relapse
- (D) Crowding is seen only in patients with erupted third molars

Q7. The medicolegal documentation required before third molar surgery should ALWAYS include:

- (A) Signed informed consent detailing risks of nerve injury, dry socket, fracture, and incomplete removal
- (B) A panoramic radiograph taken within the previous 5 years
- (C) Blood group and Rh typing of the patient
- (D) Signed consent from the patient's employer

Q8. Which of the following correctly describes the surgical approach to a distoangular mandibular third molar impaction (considered the most difficult)?

- (A) Buccal bone removal anteriorly and sectioning the crown mesially
- (B) Mesial bone removal only, followed by a lingual split technique
- (C) Envelope flap with point-elevation technique
- (D) Removal of substantial distal bone to create a pathway for posterior withdrawal of the tooth

Q9. Dexamethasone administered perioperatively for third molar surgery primarily reduces:

- (A) Risk of dry socket
- (B) Depth of anaesthesia required
- (C) Postoperative trismus and facial swelling
- (D) Incidence of secondary haemorrhage

Q10. The incidence of lingual nerve damage following mandibular third molar removal compared to inferior alveolar nerve damage is:

- (A) Lower; the lingual nerve is protected by the lingual cortex
- (B) Higher, because the lingual nerve lies directly under the mucosa at the third molar region with no bony protection
- (C) Equal for both nerves



(D) Higher for the IAN because it courses through a bony canal

Q11. Regarding bacteraemia following dental extraction and infective endocarditis prophylaxis, current guidelines state that:

- (A) All patients should receive prophylactic antibiotics before extraction
- (B) No prophylaxis is ever required for dental extractions
- (C) Prophylaxis is recommended only for patients at high risk (prosthetic valves, previous IE, congenital heart disease)
- (D) Prophylaxis is required for all patients with any cardiac history

Q12. Which facial nerve branch is at risk during removal of a LOWER third molar?

- (A) No facial nerve branch is at risk during lower third molar surgery
- (B) Marginal mandibular branch
- (C) Buccal branch
- (D) Cervical branch

Q13. A patient asks about the chance of permanent numbness after mandibular third molar removal. Based on published evidence, the approximate incidence of permanent inferior alveolar nerve paraesthesia following third molar surgery is:

- (A) Less than 0.1%
- (B) 0.5–2%
- (C) 5–10%
- (D) More than 15%

Q14. What is the PRIMARY reason that incomplete removal of the crown of an impacted third molar may lead to recurrent pericoronitis?

- (A) The residual root fragments resorb into the alveolar bone
- (B) The remaining tooth structure stimulates excess bone formation
- (C) Residual crown tissue maintains a pericoronal space which continues to harbour bacteria under the operculum
- (D) The incomplete removal causes cystic transformation immediately

Q15. On panoramic radiograph, the CBCT sign "darkening of the root" (dark band across the root at the level of the inferior alveolar canal) is associated with:

- (A) Cystic degeneration around the root apex
- (B) Dense bone island adjacent to the root
- (C) Grooving or perforation of the root by the IAN canal, indicating intimate contact
- (D) Normal trabecular pattern of the mandible



- Q16.** The "path of withdrawal" in tooth extraction refers to:
- (A) The direction in which the anaesthetic is injected
 - (B) The path the elevator follows during luxation
 - (C) The direction of the incision for a surgical flap
 - (D) The direction in which a tooth can be removed from its socket without obstruction by adjacent teeth or bone
- Q17.** During forceps extraction of a mandibular premolar, the correct sequence of movement is:
- (A) Buccal pressure first, then lingual, with a figure-of-eight rotating motion to dilate the socket, followed by delivery buccally
 - (B) Lingual pressure first, then rotation, then buccal delivery
 - (C) Straight traction occlusally without any rotation
 - (D) Rotational movement only, without any lateral luxation
- Q18.** Which of the following is the MOST important predisposing factor for mandibular body fracture during forceps extraction?
- (A) Patient anxiety during the procedure
 - (B) Inadequate local anaesthesia
 - (C) Extraction of an upper molar at the same visit
 - (D) Presence of a pathological lesion (large cyst, tumour) in the mandible weakening the bone
- Q19.** The Potts elevator is used in exodontia primarily for:
- (A) Luxation of teeth with curved or divergent roots before forceps application
 - (B) Removal of fractured root tips from the apical third of the socket
 - (C) Sectioning of multi-rooted teeth
 - (D) Incision of the alveolar mucosa
- Q20.** Oral submucous fibrosis poses a particular challenge during dental extraction because:
- (A) The mucosa bleeds excessively during injection
 - (B) Trismus severely limits mouth opening and fibrous tissue increases risk of mucosal perforation during flap elevation
 - (C) The patients are always immunocompromised
 - (D) Local anaesthetic is absorbed abnormally fast
- Q21.** The forceps used for extraction of lower anterior teeth (incisors and canines) is:
- (A) Cowhorn forceps (No. 16)
 - (B) Lower anterior (universal) forceps — No. 151



- (C) Upper universal forceps — No. 150
- (D) Root forceps No. 74

Q22. A root pick (root elevator) is indicated when:

- (A) The full crown is intact and needs luxation
- (B) Alveolar bone is extremely dense, preventing forceps placement
- (C) A root tip has fractured and lies in the apical portion of the socket
- (D) A supernumerary tooth is identified on radiograph

Q23. Regarding timing of implant placement after extraction, which statement is correct?

- (A) Immediate implant placement (Type 1) is performed at the same surgical visit as extraction, into the fresh socket
- (B) Delayed placement always requires 6 months of healing before any implant can be placed
- (C) Early placement at 4–8 weeks is classified as Type 3
- (D) Immediate loading is contraindicated in all anterior sites

Q24. A bone sequestrum after extraction appears clinically as:

- (A) Soft tissue overgrowth covering the socket
- (B) A fragment of necrotic bone that has separated from the surrounding vital bone and may extrude through the mucosa
- (C) A white fibrin clot filling the socket normally
- (D) Inflammatory granulation tissue with purulent discharge

Q25. Which suture material is MOST commonly used to close an extraction wound in oral surgery?

- (A) Non-absorbable silk (3-0)
- (B) Stainless steel wire
- (C) Polyglycolic acid only (Dexon 4-0) for all cases
- (D) Absorbable polyglactin 910 (Vicryl 3-0) or silk 3-0 depending on the clinician's preference and site

Q26. The middle superior alveolar (MSA) nerve block provides pulpal anaesthesia to the:

- (A) Upper central and lateral incisors
- (B) Upper first and second molars
- (C) Maxillary sinus only
- (D) Upper first and second premolars and the mesiobuccal root of the upper first molar

Q27. For a posterior superior alveolar (PSA) nerve block, the needle angulation and direction are:



- (A) 45 degrees inferiorly, directed medially only
- (B) 45 degrees superiorly, posteriorly, and medially (up, back, and in), to reach the posterior surface of the maxillary tuberosity
- (C) Straight horizontally, directed laterally to the buccal fat pad
- (D) Perpendicular to the mucosa, depth 25 mm

Q28. The intraoral approach to the infraorbital nerve block directs the needle toward the infraorbital foramen, which is located approximately:

- (A) Directly below the medial canthus of the eye, 5 mm below the orbital rim
- (B) 10 mm above the apex of the upper first premolar
- (C) 5–8 mm below the inferior orbital rim, in line with the pupil when looking straight ahead, directly above the apex of the upper first premolar
- (D) At the midpoint of the zygoma

Q29. The Vazirani-Akinosi closed-mouth mandibular nerve block is indicated when:

- (A) The patient cannot open the mouth adequately (trismus) for a conventional inferior alveolar nerve block
- (B) The patient is allergic to amide local anaesthetics
- (C) Supplemental infiltration of the lingual nerve is required
- (D) Only the mental nerve needs to be blocked

Q30. The MOST common reason for failure of an inferior alveolar nerve block (IANB) in an acutely infected mandibular molar region is:

- (A) Operator error in needle positioning into the pterygomandibular space
- (B) Lowered tissue pH due to infection, which increases the ionised (charged) form of the local anaesthetic, preventing membrane penetration
- (C) The patient is always anxious during infection procedures
- (D) Increased blood flow from inflammation dilutes the anaesthetic

Q31. The correct sequence of CNS effects during local anaesthetic overdose (toxicity) is:

- (A) Coma → convulsions → circumoral tingling → tinnitus
- (B) Convulsions → excitement → tinnitus → drowsiness
- (C) Circumoral tingling → tinnitus → restlessness → convulsions → CNS depression and coma
- (D) Bradycardia → hypotension → respiratory arrest → convulsions

Q32. Tricyclic antidepressants interact with adrenaline (epinephrine) in local anaesthetic solutions by:

- (A) Reducing the duration of action of lignocaine



- (B) Blocking the alpha receptors, preventing vasoconstriction
- (C) Enhancing the local anaesthetic efficacy
- (D) Potentiating the cardiovascular effects of adrenaline by blocking neuronal re-uptake, risking hypertensive crisis

Q33. The maximum safe dose of plain lignocaine (without vasoconstrictor) in a healthy adult is:

- (A) 7 mg/kg up to 500 mg
- (B) 3 mg/kg up to 200 mg
- (C) 5 mg/kg up to 300 mg
- (D) 1 mg/kg up to 100 mg

Q34. Felypressin is used as an alternative vasoconstrictor in local anaesthetic solutions because:

- (A) It has a stronger vasoconstrictive effect than adrenaline
- (B) It can be safely used in all pregnant patients without restriction
- (C) It acts on V1 receptors causing vasoconstriction without beta-adrenergic stimulation, making it safer in hypertensive and cardiac patients, though it should be avoided in pregnancy
- (D) It prolongs the duration of action twofold compared to adrenaline

Q35. Buffering of local anaesthetic solution with sodium bicarbonate (8.4%) in a 1:10 ratio has what effect?

- (A) Reduces the volume of anaesthetic needed by 50%
- (B) Increases the pH to above 9, rendering the anaesthetic ineffective
- (C) Raises the pH closer to physiological, increasing the unionised (free base) form for faster onset and reduced injection pain
- (D) Doubles the duration of pulpal anaesthesia

Q36. Regarding onset of action, which of the following sequences is CORRECT (fastest to slowest onset)?

- (A) Bupivacaine → Lidocaine → Procaine
- (B) Lidocaine → Procaine → Bupivacaine
- (C) Bupivacaine → Procaine → Lidocaine
- (D) Procaine → Lidocaine → Bupivacaine (procaine has the fastest onset, bupivacaine the slowest)

Q37. Allergic reactions to local anaesthetics are FAR more common with:

- (A) Amide agents such as lidocaine and prilocaine
- (B) Ester agents such as procaine, because their metabolite para-aminobenzoic acid (PABA) is a common allergen



- (C) Vasoconstrictor-containing formulations of amide agents
- (D) Prilocaine specifically, not other amides

Q38. Ethyl chloride spray used as a topical anaesthetic produces its anaesthetic effect by:

- (A) Rapid evaporation, causing freezing of the surface tissues (refrigeration anaesthesia)
- (B) Chemical blocking of sodium channels in the epidermis
- (C) Vasoconstriction preventing pain signal propagation
- (D) Releasing nitric oxide, which inhibits nociceptor firing

Q39. The maxillary nerve block via the greater palatine canal (pterygopalatine fossa approach) anaesthetises:

- (A) Only the hard palate and nasal floor
- (B) The lower half of the face including the mandible
- (C) The entire maxillary nerve distribution: upper teeth, palate, maxillary sinus, cheek, lower eyelid, and lateral nose on that side
- (D) The infraorbital nerve only

Q40. Regarding the duration of pulpal anaesthesia, which agent provides the LONGEST pulpal anaesthesia?

- (A) Bupivacaine (Marcaine)
- (B) Lidocaine with adrenaline
- (C) Prilocaine plain
- (D) Mepivacaine plain

Q41. The pterygomandibular space is bounded laterally by the medial surface of the mandibular ramus and medially by the:

- (A) Masseter muscle
- (B) Buccinator muscle and buccal fat pad
- (C) Mylohyoid muscle
- (D) Medial pterygoid muscle

Q42. The four compartments of the masticator space are the:

- (A) Parotid, pterygomandibular, buccal, and lateral pharyngeal spaces
- (B) Temporal, submental, sublingual, and parotid spaces
- (C) Masseteric, pterygomandibular, superficial and deep temporal spaces
- (D) Buccal, sublingual, submandibular, and submental spaces

Q43. Infection of the infratemporal space is MOST commonly derived from:



- (A) Maxillary third molar periapical abscess or failed posterior superior alveolar nerve block
- (B) Mandibular first molar abscess spreading superiorly
- (C) Parotid gland suppurative infection
- (D) Lateral pharyngeal space secondary spread

Q44. Vincent's angina is characterised by:

- (A) Streptococcal pharyngitis with tonsillar exudate
- (B) Herpetic ulceration of the soft palate and uvula
- (C) Candidal infection of the oropharynx (thrush)
- (D) Acute necrotising ulcerative gingivitis (ANUG) involving the tonsils and pharynx, caused by fusospirochetal organisms (*Fusobacterium* and *Borrelia vincenti*)

Q45. Cervicofacial actinomycosis (lumpy jaw) is characterised by all of the following EXCEPT:

- (A) Chronic indurated swelling of the jaw and neck with skin sinuses
- (B) Presence of sulfur granules in the discharge
- (C) Excellent response to a 3-day course of azithromycin
- (D) Long-course penicillin (6–12 weeks) as the treatment of choice

Q46. Garré's osteomyelitis (chronic sclerosing osteomyelitis with periostitis ossificans) differs from other forms of osteomyelitis in that it:

- (A) Occurs predominantly in children and adolescents, causes cortical bone expansion (onion-skin periosteal reaction) without suppuration, and is associated with low-grade dental infection
- (B) Is always caused by haematogenous spread from a distant focus
- (C) Requires surgical debridement as first-line treatment
- (D) Always shows bone sequestrum on radiograph

Q47. In the Cierny-Mader staging system for osteomyelitis, Stage III is defined as:

- (A) Medullary (endosteal) osteomyelitis only
- (B) Superficial osteomyelitis limited to the outer cortex
- (C) Diffuse osteomyelitis involving the entire bone cross-section
- (D) Localised osteomyelitis: a well-defined cortical sequestrum that can be removed without loss of bone stability

Q48. The primary space most directly involved in lateral pharyngeal space infection via the parapharyngeal route from odontogenic source is:

- (A) Submental space
- (B) Sublingual space



- (C) Pterygomandibular space
- (D) Parotid space

Q49. Plasma cell osteomyelitis of the jaw is distinguished from Garre's osteomyelitis by:

- (A) Its occurrence only in elderly patients over 70
- (B) Histological finding of sheets of plasma cells in the bone marrow spaces without the periosteal reaction seen in Garre's
- (C) Its exclusive involvement of the maxilla
- (D) The presence of large sulfur granules within the lesion

Q50. Ludwig's angina is a bilateral cellulitis involving all of the following spaces EXCEPT the:

- (A) Submandibular space
- (B) Sublingual space
- (C) Submental space
- (D) Lateral pharyngeal space (Ludwig's is bilateral submandibular, sublingual, and submental; lateral pharyngeal involvement is a complication)

Q51. The MOST important immediate principle in the management of Ludwig's angina is:

- (A) Urgent extraction of all offending teeth as first priority
- (B) Securing the airway (early intubation or tracheostomy), followed by IV antibiotics and surgical drainage
- (C) Starting high-dose oral amoxicillin and reviewing in 48 hours
- (D) Corticosteroid therapy to reduce oedema before any surgical intervention

Q52. Osteomyelitis of the jaw is most reliably confirmed by:

- (A) Panoramic radiograph alone showing bone destruction
- (B) Clinical signs of pus discharge and trismus
- (C) Histopathological examination of bone biopsy showing devitalised bone with inflammatory infiltrate and presence of sequestrum
- (D) Elevated serum CRP and ESR only

Q53. An intracapsular condylar fracture (Type A, diacapitular) is best managed by:

- (A) Immediate open reduction and plating via preauricular approach
- (B) Intermaxillary fixation for 6 weeks
- (C) Observation only, without any functional therapy
- (D) Functional therapy (early mobilisation with physiotherapy) in most cases, reserving ORIF for severely displaced fractures



- Q54.** Open reduction and internal fixation (ORIF) of a condylar fracture is MOST strongly indicated when:
- (A) The patient has mild deviation on opening and no malocclusion
 - (B) The patient is a child under 12 years of age
 - (C) The condyle is displaced into the middle cranial fossa or there is a foreign body in the joint, or displacement exceeds 30 degrees
 - (D) There is a unilateral fracture with less than 5 mm shortening of the ramus
- Q55.** The retromandibular transparotid approach for condylar fracture ORIF is preferred because:
- (A) It avoids any risk to the facial nerve entirely
 - (B) It requires the least surgical expertise and has no complications
 - (C) It provides direct access to the subcondylar region with relatively short working distance, acceptable scar, and manageable marginal mandibular nerve risk
 - (D) It is the only approach suitable for intracapsular fractures
- Q56.** A greenstick fracture of the mandible in children is characterised by:
- (A) Incomplete fracture where one cortex bends and the other fractures, without complete displacement, due to elasticity of the paediatric bone
 - (B) Complete fracture through both cortices but with intact periosteum
 - (C) Multiple comminuted fragments due to the low mineral content of the bone
 - (D) Fracture only of the outer cortex with sparing of the cancellous bone
- Q57.** According to AO/ASIF principles of rigid fixation for mandibular fractures, the goal is:
- (A) To achieve semi-rigid fixation that allows controlled micromotion at the fracture site
 - (B) To use the minimum number of plates regardless of fracture pattern
 - (C) Absolute stability with interfragmentary compression using bone plates, screws and lag screws, enabling primary bone healing without callus
 - (D) To use resorbable plates in all adults over 40 years
- Q58.** Le Fort I repair involves dysjunction at which anatomical landmarks?
- (A) Nasofrontal suture and zygomatic arch
 - (B) Piriform rims anteriorly and pterygomaxillary junction (pterygomaxillary dysjunction) posteriorly
 - (C) Infraorbital rims and nasal bones
 - (D) Orbital floors and frontozygomatic sutures
- Q59.** For reconstruction of an isolated orbital floor blow-out fracture, which material is currently MOST widely used?



- (A) Autogenous cartilage from the nasal septum
- (B) Silicone sheet implant
- (C) Porous polyethylene sheet (Medpor) or titanium mesh, sometimes combined
- (D) Hydroxyapatite cement alone

Q60. Bioresorbable plates used in paediatric mandibular fractures are advantageous because:

- (A) They have higher bending and torsional strength than titanium
- (B) They degrade over time, avoiding the need for second-stage hardware removal and not interfering with facial growth
- (C) They can be remodelled in the operating room at body temperature without a heat gun
- (D) They are cheaper and easier to sterilise than titanium

Q61. The Rowe and Williams classification is used for:

- (A) Odontogenic cysts of the jaw
- (B) Condylar fracture severity grading
- (C) Midface fractures including Le Fort patterns, zygomatic fractures, and naso-orbital-ethmoid fractures
- (D) Osteomyelitis staging of the facial skeleton

Q62. In a zygomatic complex fracture requiring ORIF, the three-point fixation is performed at which sites?

- (A) Infraorbital rim, maxillary buttress, and orbital roof
- (B) Zygomatic arch, frontonasal suture, and orbital floor
- (C) Frontozygomatic suture, infraorbital rim, and zygomatic buttress (zygomaticomaxillary buttress)
- (D) Zygomatic arch, orbital floor, and pterygoid plates

Q63. A patient is found to have a unilateral condylar fracture with the condylar head displaced out of the glenoid fossa into the infratemporal fossa. What is the MOST appropriate management?

- (A) Closed reduction with intermaxillary fixation for 4 weeks
- (B) Physiotherapy alone with soft diet for 8 weeks
- (C) Immediate arthrocentesis to decompress the joint
- (D) Open reduction with repositioning of the condylar head, as the condyle cannot self-reduce when displaced into the infratemporal fossa

Q64. Titanium plates used for fixation of maxillofacial fractures may require removal in approximately what percentage of patients?

- (A) 10–20% (due to plate palpability, infection, screw loosening, or thermal sensitivity)



- (B) Less than 1% (titanium is always inert and never removed)
- (C) 50% of all cases as a standard protocol
- (D) Only in children; adults never need plate removal

Q65. For a small radicular cyst (less than 2 cm), the treatment of choice after root canal therapy is:

- (A) Enucleation of the cyst lining with primary closure
- (B) Marsupialisation to allow gradual decompression
- (C) Radical resection of the jaw segment
- (D) Observation alone without surgery if the patient is asymptomatic

Q66. A residual cyst is defined as:

- (A) A cyst that reforms after incomplete enucleation of a dentigerous cyst
- (B) Any jaw cyst remaining after orthodontic treatment
- (C) A radicular cyst that persists in the jaw after extraction of the causative tooth
- (D) A cyst that develops de novo in an edentulous area without any prior dental history

Q67. The paradental cyst (mandibular buccal bifurcation cyst) characteristically occurs:

- (A) On the buccal surface of the mandibular first or second molar in children, associated with an erupting tooth
- (B) At the apex of a non-vital upper incisor following trauma
- (C) Within the follicular space of an impacted mandibular third molar
- (D) On the palate, arising from the nasopalatine duct remnants

Q68. Aspiration of a jaw cyst yields a golden-yellow fluid with cholesterol crystals. This is MOST consistent with:

- (A) Keratocystic odontogenic tumour (OKC)
- (B) Traumatic bone cyst
- (C) Radicular or dentigerous cyst
- (D) Aneurysmal bone cyst

Q69. Regarding the Keratocystic Odontogenic Tumour (KCOT)/OKC WHO classification changes, which statement is CORRECT?

- (A) In 2005 WHO classified it as a tumour (KCOT); in 2017 it was reclassified back to a cyst (OKC), reflecting its cystic nature and association with PTCH1 mutations
- (B) In 2005 it was classified as a benign cyst; in 2017 it was reclassified as a malignant tumour
- (C) It has been consistently classified as a cyst in all WHO editions without change
- (D) The 2017 reclassification was based solely on its recurrence rate after enucleation



- Q70.** Which jaw cyst has the HIGHEST recurrence rate after simple enucleation?
- (A) Radicular cyst
 - (B) Dentigerous cyst
 - (C) Keratocystic odontogenic tumour (OKC)
 - (D) Nasopalatine duct cyst
- Q71.** The gingival cyst of the newborn (dental lamina cysts/Epstein pearls/Bohn's nodules) requires:
- (A) Surgical excision under general anaesthesia
 - (B) Laser ablation in the first week of life
 - (C) No treatment, as they resolve spontaneously within a few weeks of birth
 - (D) Topical antifungal treatment to distinguish from oral candidiasis
- Q72.** The histopathological lining of a dentigerous cyst consists of:
- (A) Parakeratinised stratified squamous epithelium with basal cell palisading
 - (B) Non-keratinised stratified squamous epithelium, 2–4 cell layers thick, with potential for transformation to ameloblastoma
 - (C) Orthokeratinised stratified squamous epithelium with a prominent granular layer
 - (D) Respiratory-type pseudostratified columnar epithelium
- Q73.** A sublingual dermoid cyst is distinguished from an epidermoid cyst by:
- (A) Its location above the mylohyoid muscle
 - (B) Its origin from entrapped epithelium during embryonic development
 - (C) Its cheesy white keratin content on aspiration
 - (D) Its histological lining containing skin appendages (hair follicles, sebaceous glands, sweat glands) in addition to stratified squamous epithelium
- Q74.** Marsupialisation is preferred over enucleation for large jaw cysts because:
- (A) It achieves definitive cure without any risk of recurrence
 - (B) It is technically simpler and does not require any anaesthesia
 - (C) It reduces the risk of damage to adjacent vital structures (teeth, nerves) by allowing gradual reduction in cyst size before definitive removal
 - (D) It is the only technique that allows histopathological examination of the entire cyst wall
- Q75.** A central giant cell granuloma (CGCG) of the jaw is BEST distinguished from a true giant cell tumour of bone by:
- (A) Its location in the mandible rather than epiphyses of long bones
 - (B) The large number of multinucleated giant cells on histology



- (C) Its behaviour (CGCG is generally benign in the jaw, whereas giant cell tumour has higher aggressive potential) and the clinical/radiographic features including patient age
- (D) The presence of haemosiderin deposits on histopathology

Q76. The most appropriate first-line treatment for a central giant cell granuloma of the jaw (non-aggressive type) is:

- (A) Immediate hemimandibulectomy for all lesions
- (B) Curettage/conservative surgical excision, possibly combined with intralesional corticosteroid injections
- (C) Radical resection and immediate reconstruction with fibula free flap
- (D) Radiation therapy

Q77. An aneurysmal bone cyst (ABC) of the jaw is characterised by all of the following EXCEPT:

- (A) Blood-filled sinusoidal spaces lined by fibrous tissue without endothelium
- (B) Soap bubble or multilocular radiolucent appearance on radiograph
- (C) Occurrence as a secondary lesion in association with other jaw lesions
- (D) Dense calcified matrix throughout the lesion (ABCs are lytic, not densely calcified)

Q78. Ground-glass appearance on radiograph of the jaw is characteristically associated with:

- (A) Ossifying fibroma
- (B) Fibrous dysplasia
- (C) Ameloblastoma
- (D) Keratocystic odontogenic tumour

Q79. Eosinophilic granuloma of the jaw (Langerhans cell histiocytosis, unifocal) presents radiographically as:

- (A) "Floating teeth" appearance due to destruction of alveolar bone around the roots without loss of the root architecture
- (B) Sunburst periosteal reaction of the mandibular cortex
- (C) Multilocular radiolucency with scalloped borders
- (D) Dense osteosclerotic lesion with periosteal expansion

Q80. Burkitt's lymphoma involving the jaw is characterised by all of the following EXCEPT:

- (A) Common occurrence in African children (endemic form)
- (B) Association with Epstein-Barr virus (EBV)
- (C) Histological 'starry sky' pattern due to tingible body macrophages interspersed with neoplastic cells
- (D) Slow indolent growth pattern over many years



- Q81.** Before performing a biopsy of a suspected haemangioma of the jaw, the MOST important precaution is:
- (A) Aspiration of the lesion first—if blood is obtained, biopsy is deferred to avoid life-threatening haemorrhage
 - (B) Requesting a bone scan to assess extent before any procedure
 - (C) Performing the biopsy under general anaesthesia only
 - (D) Administering sclerosing agent before the biopsy
- Q82.** Chondrosarcoma of the jaw MOST commonly occurs at which sites?
- (A) Maxillary sinus and frontal bone
 - (B) Mandibular angle and maxillary tuberosity
 - (C) Mandibular body and ramus only
 - (D) Mandibular condyle (head and neck) and the anterior mandibular symphysis region
- Q83.** Laskin's diagnostic criteria for Myofascial Pain Dysfunction Syndrome (MPD) include all of the following EXCEPT:
- (A) Unilateral facial pain
 - (B) Tenderness of masticatory muscles on palpation
 - (C) Radiographic evidence of condylar erosion on panoramic view
 - (D) Absence of clinical, laboratory, or radiographic evidence of organic changes in the TMJ
- Q84.** MPD syndrome (myofascial pain dysfunction) most commonly affects:
- (A) Elderly men over 60
 - (B) Young adult women between 20–40 years of age
 - (C) Children and adolescents
 - (D) Men engaged in heavy manual work
- Q85.** Bimanual manipulation (deprogramming technique) for TMJ evaluation is performed to:
- (A) Guide the mandible into its most superior and anterior position in the fossa (centric relation) by applying bilateral gentle upward pressure on the chin while the fingers guide the condyles superiorly, eliminating muscle memory and muscle-guided closure
 - (B) Forcibly open the mouth during trismus to mobilise the joint
 - (C) Distract the condyle from the fossa to assess disc position
 - (D) Relocate a displaced disc into its normal position
- Q86.** An occlusal stabilisation splint (Michigan splint) used in TMJ disorders is designed with:
- (A) Posterior stops only, with anterior open bite to disclude the back teeth



- (B) Unilateral coverage of the upper arch only
- (C) Soft material to allow compression under heavy bruxing forces
- (D) Hard acrylic full-arch coverage with canine guidance and even bilateral posterior contacts in centric relation

Q87. TMJ eminence augmentation (eminoplasty) using bone graft or alloplastic material is an alternative to eminectomy for treating recurrent TMJ dislocation. The rationale of eminoplasty is to:

- (A) Increase the height of the articular eminence so the condyle cannot translate past it during maximal opening
- (B) Remove the articular eminence, creating a flat fossa that no longer traps the condyle
- (C) Reduce the height of the eminence to allow easier condylar translation
- (D) Anchor the condyle to the eminence with a suture to prevent excessive movement

Q88. Electromyography (EMG) in the assessment of TMJ disorders is used to:

- (A) Directly visualise disc displacement within the joint
- (B) Measure bone density of the condylar head
- (C) Assess intracapsular fluid volume
- (D) Evaluate the electrical activity and coordination of masticatory muscles, particularly useful for identifying muscle hyperactivity in bruxism and MPD

Q89. The normal range of maximum interincisal opening (MIO) in adults is:

- (A) 40–50 mm
- (B) 25–30 mm
- (C) 55–65 mm
- (D) 15–20 mm

Q90. Reciprocal clicking of the TMJ is associated with:

- (A) Osteoarthritis with condylar flattening and osteophyte formation
- (B) Anterior disc displacement with reduction—the disc clicks back onto the condyle during opening and again during closing
- (C) Posterior disc displacement with normal translation
- (D) Synovial chondromatosis of the TMJ

Q91. The bilateral sagittal split osteotomy (BSSO), originally described by Obwegeser and later modified by Dal Pont, splits the mandible:

- (A) Horizontally through the inferior border to advance only the chin
- (B) Vertically through the coronoid processes to mobilise the entire ramus



- (C) Through the medial and lateral cortices of the ramus along a sagittal plane, allowing the tooth-bearing segment to be moved forward or backward while maintaining broad bony contact for healing
- (D) Circumferentially around the condylar neck to allow repositioning of the condyle

Q92. Le Fort III osteotomy (craniofacial dysjunction) is indicated for:

- (A) Vertical maxillary excess (gummy smile) with normal facial thirds proportions
- (B) Midface hypoplasia involving the orbits and zygomatic arches (as in Crouzon or Apert syndrome), where the entire midface is detached at the level of the nasofrontal and frontomaxillary sutures
- (C) Isolated maxillary retrusion with normal orbital and zygomatic position (this is Le Fort I)
- (D) Bimaxillary protrusion with normal facial height

Q93. Counterclockwise rotation of the occlusal plane (anterior maxillomandibular advancement) in orthognathic surgery has been shown to benefit patients with obstructive sleep apnoea (OSA) because:

- (A) It advances the tongue base and hyoid anteriorly, enlarging the pharyngeal airway, which reduces upper airway collapse during sleep
- (B) It reduces total dental height, allowing better nasal breathing
- (C) It corrects nasal septal deviation as a secondary effect
- (D) It decreases muscular activity of the pharyngeal constrictors

Q94. Segmental Le Fort I osteotomy (Cupar technique) allows the surgeon to:

- (A) Narrow or widen the maxillary arch, level the occlusal plane, and/or correct a unilateral posterior crossbite by dividing the palate and mobilising segments independently
- (B) Advance the maxilla more than a single-piece Le Fort I osteotomy
- (C) Combine simultaneous maxillary sinus augmentation with maxillary advancement
- (D) Detach only the anterior maxilla from the posterior to correct a vertical maxillary deficiency

Q95. Two-jaw surgery (bimaxillary orthognathic surgery) is indicated in which of the following situations?

- (A) When only maxillary excess or deficiency exists and single-jaw surgery can correct the deformity without compromise
- (B) When the patient refuses single-jaw surgery
- (C) When the surgeon prefers a more complex procedure for training purposes
- (D) When the deformity involves both jaws and single-jaw movement would produce an unacceptable facial aesthetic or skeletal result (e.g., severe Class III with vertical excess)



- Q96.** Guided bone regeneration (GBR) for ridge augmentation uses a barrier membrane to:
- (A) Prevent any bone cells from entering the defect so that only collagen fills the space
 - (B) Exclude rapidly proliferating soft tissue cells from the defect, allowing slower-migrating osteoprogenitor cells to populate the space and form new bone
 - (C) Deliver growth factors directly to the periosteum
 - (D) Compress the alveolar bone to stimulate natural bone deposition
- Q97.** A frenectomy is indicated when a high labial frenal attachment:
- (A) Causes a midline diastema between the upper central incisors, blanches the interdental papilla on tension, and has failed to close after orthodontic treatment
 - (B) Is present in any child over the age of 5 years
 - (C) Causes difficulty in denture retention in all patients regardless of diastema
 - (D) Extends to the hard palate
- Q98.** Coronectomy (deliberate root retention) is preferred over full extraction of a mandibular third molar when:
- (A) The patient has active infection around the crown of the third molar
 - (B) CBCT demonstrates intimate contact between the root and the IAN canal with high risk of permanent nerve injury during full extraction
 - (C) The patient requests only partial removal for cosmetic reasons
 - (D) The root is completely developed and divergent, making extraction technically difficult but safe
- Q99.** A patient in the dental chair suddenly develops facial drooping on one side, arm weakness, and slurred speech. Using the FAST protocol, the MOST appropriate immediate action is:
- (A) Administer aspirin 300 mg immediately and continue the dental procedure after 10 minutes
 - (B) Lay the patient supine and administer oxygen via face mask, then call for a nurse
 - (C) Administer sublingual nitroglycerin and monitor blood pressure every 5 minutes
 - (D) Stop all dental treatment, call for emergency medical assistance (ambulance), note the time of symptom onset, and do not give food or drink while awaiting emergency responders
- Q100.** A patient with significant dental anxiety begins hyperventilating during a procedure. The correct management is:
- (A) Administer 100% oxygen via non-rebreather mask at 15 L/min
 - (B) Calmly reassure the patient, stop the procedure, have the patient breathe into a paper bag or cupped hands to rebreathe CO₂ and correct hypocapnia, and consider anxiolysis for future appointments



- (C) Administer intravenous midazolam immediately without further assessment
- (D) Perform immediate bag-valve-mask ventilation as the patient is in respiratory failure

BBDABBADCB CABCCDADABBCABDDBCABCDBCCDBACADCADCBDCBCCACBCBCCDAACACACCBDC

Answer: (B) [Go Back to Q1](#)

On CBCT, interruption of the cortical white line of the inferior alveolar canal on axial cuts is the most reliable sign of direct contact or penetration of the root by the IAN canal. Darkening on panoramic is a 2D sign; CBCT allows 3D assessment of root-canal relationships. Other CBCT signs include grooving, diversion, and bifurcation, but cortical interruption is the most direct indicator.

Answer: (B) [Go Back to Q2](#)

Immediate postoperative numbness of the lower lip and chin indicates injury to the inferior alveolar nerve (IAN), whose terminal branch (mental nerve) supplies the lower lip and chin. The lingual nerve injury would produce numbness of the ipsilateral tongue and floor of mouth. The buccal nerve supplies the buccal mucosa and has no cutaneous lip branch.

Answer: (D) [Go Back to Q3](#)

Pell-Gregory Class III Position C represents the deepest and most posterior impaction — the tooth is fully within the ramus and at or below the cervical line of the second molar. These teeth carry the highest risk of complications (infection, cyst, damage to adjacent teeth) if retained, and most guidelines recommend prophylactic removal when the patient is young and fit.

Answer: (A) [Go Back to Q4](#)

The lingual nerve lies immediately beneath the lingual alveolar mucosa at the third molar region with no bony protection. Excessive and prolonged pressure with a periosteal elevator during retraction of the lingual flap is the most common intraoperative mechanism of lingual nerve injury. The nerve may also be injured by the bur if it breaks through the lingual cortex.

Answer: (B) [Go Back to Q5](#)

When the periodontal status of the second molar is compromised (6 mm pockets distally), the continued presence of the third molar will perpetuate the periodontal problem, as the distal aspect of the second molar is inaccessible for hygiene. Extraction of the third molar is the definitive treatment, followed by periodontal management of the second molar.

Answer: (B) [Go Back to Q6](#)

Multiple systematic reviews have found no strong independent causal relationship between third molars and late lower incisor crowding. Crowding is multifactorial, driven by mesial drift, jaw size discrepancy, and growth changes. Prophylactic extraction of third molars to prevent crowding is not evidence-based per current guidelines (NICE, SIGN).

Answer: (A) [Go Back to Q7](#)

Signed informed consent is the cornerstone of medicolegal documentation for third molar surgery. It must document the discussion of specific risks: IAN and lingual nerve injury, dry socket, postoperative infection, jaw fracture, damage to adjacent tooth, and possibility of incomplete removal. This protects both the patient and the surgeon in the event of a complication.



Answer: (D) [Go Back to Q8](#)

Distoangular impaction is classically considered the most difficult lower third molar to extract because the crown points distally into the ramus, and the natural path of withdrawal is blocked by the mandibular ramus. Significant distal bone removal (behind the tooth) is required to create a clear posterior path for the tooth to exit the socket.

Answer: (C) [Go Back to Q9](#)

Dexamethasone (a corticosteroid) given preoperatively (e.g., 8 mg IV or IM) significantly reduces postoperative oedema and trismus following third molar surgery by suppressing the inflammatory cascade. Multiple RCTs and meta-analyses confirm its efficacy for these endpoints. It does not primarily affect dry socket risk.

Answer: (B) [Go Back to Q10](#)

The lingual nerve is injured MORE frequently than the IAN in third molar surgery because it runs directly beneath the lingual mucosa at the level of the mandibular third molar without any bony protection, making it vulnerable to direct trauma from retractors, burs, and flap reflection. Published data suggest transient lingual nerve injury occurs in up to 10% of cases, while permanent injury is 0.2–2%.

Answer: (C) [Go Back to Q11](#)

Current guidelines (AHA, NICE) recommend antibiotic prophylaxis only for patients at HIGH risk of infective endocarditis: those with prosthetic cardiac valves, previous episode of IE, congenital heart disease (unrepaired or with residual defects), or cardiac transplant valvulopathy. Routine prophylaxis for all patients undergoing dental extractions is no longer recommended.

Answer: (A) [Go Back to Q12](#)

No branch of the facial nerve is at risk during removal of a mandibular third molar performed via the standard buccal (lateral) approach. The facial nerve exits at the stylomastoid foramen and its branches are superficial to the parotid. The marginal mandibular branch may be at risk during submandibular approaches, not routine third molar surgery.

Answer: (B) [Go Back to Q13](#)

Published systematic reviews report permanent IAN paraesthesia after third molar surgery in approximately 0.5–2% of cases, and permanent lingual nerve damage in approximately 0.2–2%. Transient changes resolve within weeks to months. This information must be included in informed consent discussions.

Answer: (C) [Go Back to Q14](#)

If the crown of an impacted third molar is not fully removed, a residual pericoronal space persists beneath the operculum. This space continues to harbour bacteria and food debris, making complete elimination of pericoronitis impossible. Complete removal of the crown and roots (or operculectomy if the tooth is otherwise ideally positioned) is essential to resolve the condition permanently.

Answer: (C) [Go Back to Q15](#)

The "darkening of the root" sign on panoramic radiograph occurs because the inferior alveolar



canal traverses through the root substance, creating a dark band within the root image due to reduced density of the root at the site of grooving or perforation. CBCT confirmation typically shows cortical interruption of the canal wall at that level, indicating intimate contact.

Answer: (D) [Go Back to Q16](#)

The path of withdrawal is a fundamental concept in dental extraction: it is the specific direction in which the tooth can be delivered from the socket without being obstructed by neighbouring teeth, opposing teeth, or alveolar bone. Identifying the correct path of withdrawal before applying forceps prevents root fracture and alveolar fracture.

Answer: (A) [Go Back to Q17](#)

Mandibular premolars have a single conical root, and the correct extraction sequence is: firm buccal pressure to expand the socket, then lingual pressure, with figure-of-eight rotation to progressively dilate the periodontal ligament space and alveolar bone, followed by delivery in the buccal direction (the path of withdrawal for lower premolars is buccally).

Answer: (D) [Go Back to Q18](#)

Mandibular body fracture during extraction is a serious complication most strongly associated with pre-existing pathology weakening the bone, including large odontogenic cysts, tumours, osteomyelitis, or osteoporosis. Ankylosed teeth and deeply positioned hypererupted third molars also increase fracture risk due to the extreme leverage forces required.

Answer: (A) [Go Back to Q19](#)

The Potts elevator (curved elevator) is used primarily for luxation of multi-rooted mandibular molars and teeth with curved or divergent roots before applying forceps. It helps sever the periodontal ligament and expands the socket. It is placed in the interradicular space or along the furcation, not used for root tip retrieval (which requires root picks/root elevators).

Answer: (B) [Go Back to Q20](#)

Oral submucous fibrosis (OSMF) causes progressive fibrous replacement of the oral submucosa, resulting in severe trismus with limited mouth opening. The fibrotic bands make the mucosa inelastic and brittle, with high risk of perforation during flap elevation. These factors make surgical extractions technically challenging and increase complication risk.

Answer: (B) [Go Back to Q21](#)

Lower anterior teeth (incisors and canines) are extracted with lower anterior (universal) forceps No. 151 in the American system (or equivalent). These have slender beaks angled downward to grasp the root below the gingival margin. Cowhorn forceps are for lower molars; upper forceps (No. 150) are used for maxillary teeth.

Answer: (C) [Go Back to Q22](#)

A root pick (also called a root elevator, apical elevator, or cryer elevator) is specifically designed to retrieve fractured root tips from the apical portion of the socket. It has a fine pointed or spear-shaped tip that allows it to be wedged between the root fragment and the socket wall to elevate the fragment.



Answer: (A) [Go Back to Q23](#)

Per the ITI classification: Type 1 = immediate placement at the time of extraction; Type 2 = early placement 4–8 weeks post-extraction (soft tissue healing); Type 3 = early placement 12–16 weeks (partial bone healing); Type 4 = late placement after complete healing (>6 months). Immediate loading is distinct from immediate placement and may be combined with Type 1 in appropriate cases.

Answer: (B) [Go Back to Q24](#)

A bone sequestrum is a fragment of devitalised (necrotic) bone that has been separated from the surrounding living bone. After extraction, it may form due to local ischaemia or osteomyelitis. It typically presents as a loose or partially extruding piece of whitish-grey bone in the socket, often surrounded by granulation tissue, and may cause pain and delayed healing.

Answer: (D) [Go Back to Q25](#)

Both absorbable polyglactin 910 (Vicryl 3-0) and non-absorbable silk 3-0 are commonly used for extraction wound closure. Vicryl is preferred for its self-dissolving property (no suture removal required), particularly in posterior regions. Silk is easy to handle but requires removal at 7–10 days. The choice depends on the clinical situation and operator preference.

Answer: (D) [Go Back to Q26](#)

The middle superior alveolar (MSA) nerve is a branch of the infraorbital nerve that provides pulpal anaesthesia to the upper first and second premolars and the mesiobuccal root of the upper first molar. It is present in approximately 70% of patients; when absent, these teeth receive innervation from both PSA and ASA nerves.

Answer: (B) [Go Back to Q27](#)

The PSA nerve block requires the needle to be directed 45 degrees superiorly (upward), posteriorly (backward), and medially (inward) toward the posterior surface of the maxillary tuberosity. This angulation guides the needle tip to the PSA nerve foramina on the infratemporal surface of the maxilla, avoiding penetration of the pterygoid venous plexus if depth is controlled (no more than 16 mm in adults).

Answer: (C) [Go Back to Q28](#)

The infraorbital foramen is located approximately 5–8 mm below the inferior orbital rim, in the midpupillary line (when the patient looks straight ahead), directly above the apex of the upper first premolar. For the intraoral approach, the needle is directed along the long axis of the upper first premolar toward this landmark.

Answer: (A) [Go Back to Q29](#)

The Vazirani-Akinosi closed-mouth mandibular nerve block is specifically designed for patients with limited mouth opening (trismus) who cannot cooperate for a standard Halstead IANB. The needle is directed parallel to the occlusal plane of the maxillary teeth while the patient's mouth is closed, entering the pterygomandibular space from the medial aspect.

Answer: (B) [Go Back to Q30](#)

Acute infection lowers tissue pH (makes it more acidic). Local anaesthetics are weak bases; in



an acidic environment, the equilibrium shifts toward the ionised (cationic) form of the anaesthetic, which cannot cross lipid membranes. Therefore, less of the unionised (free base) form is available to diffuse through nerve sheaths and membranes, reducing the effectiveness of the block.

Answer: (C) [Go Back to Q31](#)

The progressive sequence of CNS toxicity from local anaesthetic overdose is: (1) circumoral tingling and numbness, (2) tinnitus and auditory changes, (3) visual disturbances, (4) restlessness, agitation, slurred speech, (5) convulsions (tonic-clonic), (6) CNS depression, respiratory arrest, and coma. This biphasic pattern (initial excitation then depression) is characteristic of LA toxicity.

Answer: (D) [Go Back to Q32](#)

Tricyclic antidepressants (e.g., amitriptyline) block the neuronal re-uptake of catecholamines (noradrenaline and adrenaline) at adrenergic nerve terminals. This potentiates the cardiovascular effects of exogenous adrenaline in LA solutions — causing potentially dangerous hypertension and tachycardia. The maximum concentration of adrenaline used should be reduced (1:200,000 or less) in patients on TCAs.

Answer: (B) [Go Back to Q33](#)

The maximum safe dose of plain lignocaine (without vasoconstrictor) in a healthy adult is 3 mg/kg body weight, with an absolute maximum of 200 mg (approximately 2% lignocaine = 20 mg/mL, so a maximum of 10 mL). With adrenaline, the maximum increases to 7 mg/kg up to 500 mg because vasoconstriction slows absorption.

Answer: (C) [Go Back to Q34](#)

Felypressin (octapressin) is a synthetic analogue of vasopressin (ADH) that acts on V1 (vascular) receptors to cause smooth muscle contraction and vasoconstriction. Unlike adrenaline, it has no direct cardiac stimulant (beta-adrenergic) effect, making it safer in patients with cardiovascular disease. However, felypressin causes uterine smooth muscle contraction and should be avoided in pregnancy.

Answer: (C) [Go Back to Q35](#)

Adding sodium bicarbonate 8.4% in a 1:10 ratio (1 part NaHCO₃ to 9 parts LA) raises the pH of the acidic commercial LA solution (pH ~4.5) closer to physiological pH (7.4). This increases the proportion of unionised (free base) form of the anaesthetic, which readily crosses nerve membranes, resulting in faster onset (by 2–3 minutes) and reduced injection pain from the more physiological pH.

Answer: (D) [Go Back to Q36](#)

Procaine has the fastest onset of clinically used local anaesthetics due to its high diffusibility and relatively low protein binding. Lidocaine has intermediate onset (rapid in clinical practice). Bupivacaine has the slowest onset due to its high lipophilicity and protein binding, though it has the longest duration of action. The sequence fastest to slowest: Procaine → Lidocaine → Bupivacaine.

Answer: (B) [Go Back to Q37](#)

True allergic (IgE-mediated or delayed hypersensitivity) reactions to local anaesthetics are almost exclusively associated with ESTER anaesthetics (procaine, benzocaine, tetracaine). The metabolite para-aminobenzoic acid (PABA) is a potent allergen. AMIDE anaesthetics (lidocaine, bupivacaine,



prilocaine, mepivacaine) very rarely cause true allergic reactions; most "allergic" reactions to amides are vasovagal or toxic.

Answer: (A) [Go Back to Q38](#)

Ethyl chloride (chloroethane) spray evaporates rapidly on contact with skin or mucosa, extracting heat from the surface and causing local freezing (temperatures as low as -15°C to -20°C). This refrigeration anaesthesia numbs the surface tissues, useful for incision of superficial abscesses or as a topical prior to injection. It is not a chemical sodium channel blocker.

Answer: (C) [Go Back to Q39](#)

The maxillary nerve (V2) block via the greater palatine canal deposits anaesthetic into the pterygopalatine fossa, anaesthetising the entire V2 distribution: upper teeth and their supporting structures, palate, maxillary sinus, inferior orbital contents, cheek, lower eyelid, lateral nose, and upper lip on the ipsilateral side. It is used for extensive maxillary surgical procedures.

Answer: (A) [Go Back to Q40](#)

Bupivacaine 0.5% with adrenaline provides the longest duration of pulpal anaesthesia — approximately 60–90 minutes of pulpal anaesthesia (and up to 7–12 hours of soft tissue anaesthesia). Its high protein binding (95%) and lipophilicity account for its long duration. Lidocaine with adrenaline provides approximately 60 minutes; plain agents provide 30–45 minutes or less.

Answer: (D) [Go Back to Q41](#)

The pterygomandibular space is a potential space between the medial surface of the mandibular ramus (lateral wall) and the medial pterygoid muscle (medial wall). Superiorly, it is bounded by the lateral pterygoid muscle; inferiorly by the lower border of the medial pterygoid where it inserts on the mandible. It communicates with the parapharyngeal and masticator spaces.

Answer: (C) [Go Back to Q42](#)

The masticator space encompasses the muscles of mastication and surrounding compartments: (1) the masseteric space (between masseter and lateral mandibular ramus), (2) the pterygomandibular space (between medial pterygoid and medial mandibular ramus), (3) the superficial temporal space, and (4) the deep temporal space. These spaces communicate with each other and with adjacent deep fascial spaces.

Answer: (A) [Go Back to Q43](#)

The infratemporal space lies posterior to the maxillary tuberosity and communicates directly with the pterygomandibular and buccal spaces. It is most commonly infected from periapical abscess of the maxillary third molar (or following a failed posterior superior alveolar nerve block). Spread from this space can reach the orbital and parapharyngeal regions.

Answer: (D) [Go Back to Q44](#)

Vincent's angina is an extension of ANUG (acute necrotising ulcerative gingivitis) to the tonsils and pharynx. It is caused by fusospirochetal organisms — *Fusobacterium nucleatum* and *Borrelia vincenti* (*Treponema vincentii*). It presents with necrotic pharyngeal ulcers, severe halitosis, fever, and regional lymphadenopathy. Treatment includes metronidazole and local debridement.



Answer: (C) [Go Back to Q45](#)

Cervicofacial actinomycosis responds to long-course penicillin (IV benzylpenicillin followed by oral amoxicillin for 6–12 weeks total). A 3-day course of azithromycin is wholly inadequate and would result in treatment failure. The organism (*Actinomyces israelii*) is deeply embedded in sulphur granule colonies within indurated tissue, requiring prolonged antibiotic penetration.

Answer: (A) [Go Back to Q46](#)

Garré's osteomyelitis (proliferative periostitis, chronic osteomyelitis with periostitis ossificans) characteristically occurs in children and adolescents in response to low-grade dental infection (usually a chronically infected lower first molar). It produces bony expansion of the cortex in an "onion-skin" periosteal reaction pattern, visible on CT. Unlike suppurative osteomyelitis, there is no pus and no sequestrum. Treatment is removal of the offending tooth, resolving the infection.

Answer: (D) [Go Back to Q47](#)

In the Cierny-Mader staging system: Stage I = medullary (endosteal involvement only); Stage II = superficial (outer cortex only); Stage III = localised (cortical sequestrum well demarcated, removal does not destabilise the bone); Stage IV = diffuse (through and through involvement requiring segmental resection for cure). Stages I–III can be treated with debridement alone; Stage IV may require resection.

Answer: (C) [Go Back to Q48](#)

The pterygomandibular space directly communicates with the lateral pharyngeal (parapharyngeal) space via the superior constrictor muscle. Odontogenic infections, particularly from lower molars or from poorly placed inferior alveolar nerve blocks, can spread via the pterygomandibular space to the lateral pharyngeal space, with risk of airway compromise.

Answer: (B) [Go Back to Q49](#)

Plasma cell osteomyelitis is a rare chronic jaw condition characterised histologically by dense sheets of plasma cells within the bone marrow spaces. Unlike Garré's osteomyelitis, it shows no periosteal expansion and is not associated with low-grade dental infection. It may resemble a neoplastic or haematological disorder and requires biopsy for diagnosis.

Answer: (D) [Go Back to Q50](#)

Ludwig's angina by definition is a bilateral, rapidly spreading cellulitis involving the submandibular, sublingual, and submental spaces simultaneously. The lateral pharyngeal space is NOT one of the primary spaces in Ludwig's angina, though it is frequently secondarily involved as the infection spreads, which is why airway compromise can be so severe.

Answer: (B) [Go Back to Q51](#)

Ludwig's angina is a life-threatening emergency. The most critical immediate management priority is securing the airway (early nasal intubation or surgical airway/tracheostomy) before oedema obstructs it completely, followed immediately by high-dose IV antibiotics (covering *Streptococcus*, *Staphylococcus*, and anaerobes) and surgical drainage of the involved spaces.

Answer: (C) [Go Back to Q52](#)



Definitive diagnosis of osteomyelitis requires histopathological examination of bone biopsy showing devitalised bone (empty osteocyte lacunae), inflammatory cell infiltrate (neutrophils in acute, lymphocytes/plasma cells in chronic), and sequestrum. Radiographic changes (bone destruction) lag clinical infection by 10–14 days and are not specific; elevated inflammatory markers support the diagnosis but are not confirmatory.

Answer: (D) [Go Back to Q53](#)

Intracapsular (diacapitular) condylar fractures in adults are typically managed conservatively with early functional rehabilitation (physiotherapy, soft diet, guided jaw exercises) rather than ORIF, as the intracapsular anatomy makes surgical access and fixation extremely challenging with high risk to the joint. ORIF is reserved for cases with severely displaced fragments or foreign body in the joint.

Answer: (C) [Go Back to Q54](#)

The absolute indications for ORIF of condylar fractures include: condyle displaced into the middle cranial fossa, presence of a foreign body in the joint, displacement of greater than 30 degrees, and inability to obtain adequate occlusion with closed reduction. In children, the capacity for remodelling makes conservative management strongly preferred.

Answer: (C) [Go Back to Q55](#)

The retromandibular transparotid (retroparotid) approach provides direct access to the subcondylar region with a short working distance. While the marginal mandibular branch of the facial nerve is at risk (not zero), the approach allows good visualisation and plate placement. The preauricular approach is better for intracapsular fractures. Both approaches carry facial nerve risk.

Answer: (A) [Go Back to Q56](#)

Greenstick fractures occur in children because paediatric bone has higher collagen content and greater elasticity. In a greenstick fracture, one cortex fractures incompletely while the other cortex bends without breaking. The periosteum usually remains intact on one side, holding the fragments in place. These fractures are incomplete and may require only gentle reduction under sedation or GA.

Answer: (C) [Go Back to Q57](#)

AO/ASIF principles are based on: (1) anatomical reduction, (2) stable internal fixation (absolute stability with compression), (3) preservation of blood supply, and (4) early active mobilisation. Absolute stability with interfragmentary compression using plates and screws allows primary bone healing (direct cortical remodelling) without callus formation, enabling early function.

Answer: (B) [Go Back to Q58](#)

Le Fort I repair (and Le Fort I osteotomy in orthognathic surgery) involves a horizontal cut above the tooth roots, passing through the piriform rims (lateral walls of the nasal aperture) anteriorly, through the lateral maxillary walls, and completing the dysjunction at the pterygomaxillary junction (pterygomaxillary dysjunction) posteriorly. This separates the tooth-bearing alveolus from the rest of the craniofacial skeleton.

Answer: (C) [Go Back to Q59](#)

Porous polyethylene (Medpor) and titanium mesh are the most widely used materials for or-



bital floor reconstruction in blow-out fractures. Medpor allows fibrovascular ingrowth for stability; titanium mesh is rigid and easily contoured. Autogenous bone (calvaria, iliac crest) remains gold standard but adds donor site morbidity. Silicone is no longer recommended due to migration and infection risk.

Answer: (B) [Go Back to Q60](#)

Bioresorbable (absorbable) plates degrade through hydrolysis over months to years, eliminating the need for a second procedure to remove hardware. This is particularly important in growing children where titanium plates can potentially interfere with facial growth or become incorporated into the bone, making future removal difficult.

Answer: (C) [Go Back to Q61](#)

The Rowe and Williams classification is a comprehensive system for classifying midface fractures, covering Le Fort I, II, and III patterns, zygomatic fractures, NOE (naso-orbital-ethmoid) fractures, and frontal bone fractures. It is the standard reference framework for categorising the spectrum of midfacial skeletal injuries.

Answer: (C) [Go Back to Q62](#)

The three-point fixation for a zygomatic complex fracture is performed at: (1) the frontozygomatic (FZ) suture (upper outer orbit), (2) the infraorbital rim (lower orbital margin), and (3) the zygomaticomaxillary buttress (ZM buttress, below the infraorbital rim on the anterior maxillary wall). This three-point stabilisation restores the three-dimensional position of the zygoma.

Answer: (D) [Go Back to Q63](#)

When the condylar head is displaced into the infratemporal fossa (medially and superiorly through the fractured temporal bone), closed reduction is impossible because the condyle has been displaced into a bony recess. Open reduction with direct retrieval and repositioning of the condyle is mandatory in this scenario, as spontaneous reduction does not occur.

Answer: (A) [Go Back to Q64](#)

Studies report that approximately 10–20% of patients with titanium plates for maxillofacial fractures require plate removal. Reasons include plate palpability (especially on the forehead, orbital rim, and zygoma), plate or screw infection, plate loosening, thermal sensitivity (coldness in thin skin areas), and patient preference. Titanium is highly biocompatible but not universally problem-free.

Answer: (A) [Go Back to Q65](#)

For small radicular cysts (conventionally less than 2 cm in diameter) following successful root canal therapy, enucleation with primary closure is the treatment of choice. The cyst lining is removed in toto for histopathological confirmation, the bony cavity heals by normal bone regeneration, and primary closure promotes uneventful healing.

Answer: (C) [Go Back to Q66](#)

A residual cyst is defined as a radicular cyst (inflammatory periapical cyst) that remains in the jaw after the causative tooth has been extracted. If the cyst lining is not enucleated at the time of extraction, it may persist and continue to grow slowly. It is the most common type of residual jaw cyst



encountered in edentulous areas.

Answer: (A) [Go Back to Q67](#)

The paradental cyst (also called mandibular buccal bifurcation cyst) is an inflammatory odontogenic cyst occurring on the buccal surface or buccal bifurcation of a vital mandibular molar (typically the first or second molar) in children and adolescents during tooth eruption. The tooth is vital. It is thought to arise from inflammation around the partially erupted crown.

Answer: (C) [Go Back to Q68](#)

Golden-yellow aspiration fluid with cholesterol crystals (Hollenhorst crystals) is characteristic of radicular and dentigerous cysts, which develop a cholesterol-rich exudate from degenerated inflammatory cell membranes. OKC aspirates yield white, cheesy, or cream-coloured material (keratin); traumatic bone cysts return blood or serosanguinous fluid; aneurysmal bone cysts return blood under pressure.

Answer: (A) [Go Back to Q69](#)

The 2005 WHO Classification of Head and Neck Tumours classified the OKC as a benign odontogenic tumour, renaming it Keratocystic Odontogenic Tumour (KCOT), based on its aggressive behaviour, high recurrence rate, and association with the PTCH1 tumour suppressor gene. The 2017 WHO Classification reverted it to the cyst category as Odontogenic Keratocyst (OKC), acknowledging its cystic nature and clinical presentation.

Answer: (C) [Go Back to Q70](#)

The keratocystic odontogenic tumour (OKC) has the highest recurrence rate among jaw cysts after simple enucleation, reported at 25–62% in various series. Reasons include: thin friable lining that tears easily leaving residual cells, daughter cysts in the cyst wall, and satellite cysts in adjacent bone. Additional treatments such as Carnoy's solution application, peripheral ostectomy, or marsupialization prior to enucleation are used to reduce recurrence.

Answer: (C) [Go Back to Q71](#)

Gingival cysts of the newborn (dental lamina cysts, Epstein pearls on the palatal raphe, Bohn's nodules on the palate and alveolus) are keratin-filled cysts from remnants of the dental lamina. They are present in up to 85% of newborns, are asymptomatic, and resolve spontaneously within 2–5 weeks of birth as they rupture into the oral cavity. No treatment is required.

Answer: (B) [Go Back to Q72](#)

The dentigerous cyst is lined by non-keratinised stratified squamous epithelium, typically 2–4 cell layers thick (thin, flat lining), arising from the reduced enamel epithelium. Importantly, the lining has the potential to undergo metaplasia to respiratory-type epithelium (from maxillary cysts), or neoplastic transformation to ameloblastoma or, rarely, squamous cell carcinoma — hence histopathological examination of all enucleated cysts is mandatory.

Answer: (D) [Go Back to Q73](#)

Both dermoid and epidermoid cysts are developmental cysts arising from entrapped ectodermal tissue. The key histological distinction is that dermoid cysts contain skin appendages (hair follicles,



sebaceous glands, sweat glands) within the fibrous cyst wall, in addition to the squamous epithelial lining. Epidermoid cysts have only the squamous epithelial lining and a keratin-filled lumen without adnexal structures.

Answer: (C) [Go Back to Q74](#)

Marsupialisation (Parks I operation) creates a surgical window into the cyst, which is sutured open to the oral mucosa, transforming it into a self-cleansing pouch. As cyst contents drain and external pressure increases, the cyst contracts. This gradual reduction in size protects adjacent vital structures (teeth, IAN, sinus) from damage during eventual definitive enucleation (two-stage procedure).

Answer: (C) [Go Back to Q75](#)

Central giant cell granuloma (CGCG) of the jaw and giant cell tumour (GCT) of bone are histologically indistinguishable — both contain multinucleated osteoclast-like giant cells. The distinction is clinical and biological: CGCG in the jaw is generally more benign (though aggressive forms exist), occurs in younger patients, rarely recurs after curettage in non-aggressive cases, and does not metastasise. GCT of long bone epiphyses is biologically more aggressive with higher recurrence and occasional metastasis.

Answer: (B) [Go Back to Q76](#)

For non-aggressive CGCG, conservative curettage is first-line treatment, with intralesional corticosteroid injections (triamcinolone acetonide) used as adjuncts or in recurrent cases to reduce giant cell activity and lesion volume. Calcitonin injections and interferon-alpha have also been used. Resection is reserved for aggressive lesions with cortical perforation or recurrence.

Answer: (D) [Go Back to Q77](#)

Aneurysmal bone cysts are characterised by blood-filled sinusoidal cavities lined by fibrous tissue (not true endothelium), soap-bubble multilocular radiolucency with cortical expansion, and frequent occurrence secondary to other jaw lesions (CGCG, ossifying fibroma, fibrous dysplasia). They are completely lytic with no dense calcified matrix — dense calcification throughout the lesion would suggest ossifying fibroma or calcifying epithelial odontogenic tumour (CEOT), not ABC.

Answer: (B) [Go Back to Q78](#)

Ground-glass (orange-peel) radiographic appearance is pathognomonic of fibrous dysplasia of the jaw (monostotic or craniofacial). It represents the disordered mixture of immature woven bone trabeculae and cellular fibrous stroma, producing a uniformly hazy, granular appearance that blends with the surrounding bone without a distinct border. Ossifying fibroma, by contrast, has a well-defined corticated border.

Answer: (A) [Go Back to Q79](#)

Langerhans cell histiocytosis (eosinophilic granuloma, unifocal) of the jaw destroys the alveolar bone surrounding the teeth, creating the classic "floating teeth" or "teeth-in-air" appearance on radiograph. The roots appear intact but lack visible surrounding bone support. This pattern is distinct from periodontal bone loss, which is more generalised and coronal.

Answer: (D) [Go Back to Q80](#)



Burkitt's lymphoma (particularly the endemic African form in children) is characterised by extremely rapid growth — one of the fastest-growing human tumours, doubling time of approximately 24–48 hours. It presents as rapidly enlarging jaw swelling in African children (endemic form) or in immunocompromised patients (sporadic). A slow indolent growth pattern is characteristic of low-grade lymphomas, not Burkitt's.

Answer: (A) [Go Back to Q81](#)

Haemangiomas of the jaw are vascular lesions with direct communication to the systemic vasculature. Biopsy without prior aspiration has caused life-threatening haemorrhage. The critical precaution is aspiration before any biopsy: if the aspirate is bright red blood under arterial pressure, the procedure is stopped and the diagnosis pursued by angiography/MRI, and surgical excision is planned with adequate haemostatic control.

Answer: (D) [Go Back to Q82](#)

Chondrosarcoma of the jaw is rare but has a predilection for the mandibular condyle/condylar head and the anterior mandible (symphysis region). Secondary sites include the maxillary alveolus. The condyle is the most frequent site in the mandible. Radiographically, it shows a "sunburst" pattern or widened periodontal ligament space around involved teeth.

Answer: (C) [Go Back to Q83](#)

Laskin's (1969) diagnostic criteria for MPD syndrome include: (1) unilateral preauricular/facial pain; (2) tenderness of one or more masticatory muscles on palpation; (3) TMJ clicking or popping; (4) restricted or deviated mandibular movement; and critically (5) ABSENCE of radiographic or clinical evidence of organic joint changes. Radiographic condylar erosion would indicate true TMJ arthritis, not MPD.

Answer: (B) [Go Back to Q84](#)

Epidemiological studies consistently show that TMJ/MPD disorders predominate in young adult women, with a female-to-male ratio of approximately 3–4:1, and peak prevalence in the 20–40 year age group. Psychosocial factors (stress, anxiety, somatisation) and female hormonal influences (oestrogen receptors in TMJ disc) are implicated in this demographic predilection.

Answer: (A) [Go Back to Q85](#)

Bimanual manipulation (also called the chin-point guidance technique or Dawson bimanual technique) places both thumbs on the chin and fingers bilaterally under the lower border of the mandible, applying gentle bilateral upward-and-forward pressure to guide the condyles to their most superior position in the fossae. This deprograms muscle proprioception, allowing the clinician to find true centric relation for diagnostic mounting.

Answer: (D) [Go Back to Q86](#)

A Michigan (stabilisation) occlusal splint is fabricated from hard acrylic, covers the full arch (upper), and is designed with: even bilateral posterior contacts in centric relation, canine guidance (or anterior-guided lateral excursions), and posterior disclusion in excursive movements. This eliminates occlusal interferences and reduces muscle hyperactivity by providing a stable, balanced occlusal scheme at a corrected vertical.



Answer: (A) [Go Back to Q87](#)

Eminoplasty (eminence augmentation) increases the height of the articular eminence using bone graft or alloplastic material, creating a physical barrier that prevents the condyle from translating anterior to the eminence during maximal opening (which is the mechanism of dislocation). This is in contrast to eminectomy, which removes the eminence to allow the dislocated condyle to spontaneously reduce by eliminating the mechanical obstacle.

Answer: (D) [Go Back to Q88](#)

Electromyography (EMG) records the electrical activity generated by masticatory muscles (masseter, temporalis, medial pterygoid) during rest and function. In TMJ disorders, EMG is used to identify muscle hyperactivity, asymmetry in muscle recruitment, and parafunctional activity (bruxism). It is not used for joint imaging — MRI is used for disc position assessment.

Answer: (A) [Go Back to Q89](#)

The normal maximum interincisal opening (MIO) in adults ranges from 40–50 mm (some sources state 35–55 mm, with the commonly accepted clinical normal being greater than 40 mm). Restricted mouth opening is defined as MIO less than 35 mm. MIO is measured with a millimeter ruler from upper to lower central incisor edges on maximum voluntary opening.

Answer: (B) [Go Back to Q90](#)

Reciprocal clicking is the hallmark of anterior disc displacement with reduction (DDwR). In DDwR: (1) at rest the disc is displaced anteriorly; (2) on opening, the condyle slides forward and recaptures the disc (opening click); (3) on closing, the condyle slides back and the disc slips forward again (closing click). The two clicks — one on opening and one on closing — form the "reciprocal" pattern.

Answer: (C) [Go Back to Q91](#)

The BSSO (Obwegeser 1955, modified by Dal Pont 1961) splits each mandibular ramus along a sagittal plane: a medial horizontal cut above the mandibular foramen through the lingual cortex, a buccal vertical cut anterior to the second molar through the lateral cortex (Dal Pont modification), and connection of the two cuts along the inferior border. This produces proximal (condyle-bearing) and distal (tooth-bearing) segments with large overlapping bone contact for reliable healing.

Answer: (B) [Go Back to Q92](#)

Le Fort III osteotomy detaches the entire midface (including zygomatic arches, orbital walls, and nasal bones) from the cranial base at the level of the nasofrontal, frontomaxillary, and frontozygomatic sutures. It is indicated for craniofacial syndromes with midface hypoplasia involving the orbits and zygomata (Crouzon, Apert syndrome), where Le Fort I would only address the dental level and leave the orbital retrusion uncorrected.

Answer: (A) [Go Back to Q93](#)

Maxillomandibular advancement (MMA) with counterclockwise rotation of the occlusal plane advances the mandible, tongue base, hyoid bone, and soft tissue pharyngeal walls anteriorly and inferiorly. This enlarges the posterior airway space (retropalatal and retroglottal dimensions), reducing upper airway collapsibility during sleep. MMA is the most effective surgical treatment for obstructive sleep apnoea with success rates exceeding 90%.



Answer: (A) [Go Back to Q94](#)

Segmental Le Fort I osteotomy divides the maxilla into two or more segments (typically a parasagittal palatal cut) in addition to the horizontal Le Fort I cut, allowing independent movement of maxillary segments. This enables narrowing or widening of the transverse dimension, correction of a unilateral crossbite, and levelling of a canted occlusal plane — movements not possible with a single-piece Le Fort I osteotomy.

Answer: (D) [Go Back to Q95](#)

Bimaxillary (two-jaw) surgery is indicated when: (1) the deformity involves both jaws; (2) single-jaw movement alone would create an unacceptable facial profile (e.g., excessive chin advancement without maxillary repositioning would produce a "witch's profile"); (3) large movements are required that would strain the soft tissue envelope if done in one jaw; or (4) a Class III deformity has vertical maxillary excess requiring Le Fort I impaction combined with mandibular setback.

Answer: (B) [Go Back to Q96](#)

GBR barrier membranes (resorbable collagen or non-resorbable PTFE) function by compartmentalising the bone defect and excluding rapidly proliferating gingival fibroblasts and epithelial cells. Osteoprogenitor cells from the periosteum, endosteum, and bone marrow — which migrate more slowly — are thus allowed to populate the defect without competition, forming new bone (osteoconduction and osteogenesis).

Answer: (A) [Go Back to Q97](#)

Frenectomy is indicated when the maxillary labial frenum inserts at or between the central incisors (blanches the interdental papilla on labial tension), contributes to a midline diastema, and the diastema has failed to close spontaneously after eruption of the permanent canines (or failed to close after orthodontic treatment). Timing is usually after orthodontic closure of the diastema to prevent relapse from scar tissue pull.

Answer: (B) [Go Back to Q98](#)

Coronectomy (intentional partial odontectomy) is recommended when CBCT confirms that the mandibular third molar roots are in intimate contact with or channelling through the IAN canal, placing the nerve at high risk of permanent damage during full extraction. Only the crown is removed; the roots are left in situ and resorb or remain inert. It is contraindicated in the presence of active periapical or pericoronal infection.

Answer: (D) [Go Back to Q99](#)

The FAST protocol (Face drooping, Arm weakness, Speech difficulty, Time to call emergency) for stroke recognition in the dental chair requires: immediate cessation of treatment, activation of emergency medical services (ambulance), noting the exact time of symptom onset (critical for thrombolysis eligibility within 4.5 hours), and keeping the patient safe (recovery position if unconscious, nothing by mouth). Aspirin should not be given without CT confirmation that the stroke is ischaemic (not haemorrhagic).

Answer: (B) [Go Back to Q100](#)

Hyperventilation from anxiety causes excessive CO₂ exhalation, leading to hypocapnia and respi-



ratory alkalosis. The patient experiences dizziness, tingling, and carpopedal spasm. Management: (1) calmly reassure the patient and remove anxiety stimulus; (2) stop the dental procedure; (3) instruct the patient to breathe slowly into a paper bag or cupped hands to rebreathe exhaled CO₂ and correct hypocapnia. Oxygen administration would worsen hypocapnia and is contraindicated.

