LOCAL ANESTHETIC TECHNIQUES FOR DENTAL HYGIENIST
CONTINUING PROFESSIONAL DEVELOPMENT, DENTISTRY
CONTINUING COMPETENCY & ASSESSMENT
UNIVERSITY OF MANITOBA

CHALLENGE EXAMINATION

EXAM “A” April 23, 2021

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PAIN MANAGEMENT

FINAL EXAM

1. A hygienist must assess the need for local anesthesia on an individual client basis. A decision to administer local anesthesia should be based on (the):

   a. extent of treatment
   b. patient's pain threshold
   c. amount of pain which may be produced
   d. all answers are correct

2. Uncontrolled hyperthyroidism, severe cardiovascular disease, and blood pressure in excess of 200 mm Hg. may all be reason for:

   a. using no vasoconstrictor
   b. using an ester anesthetic solution
   c. using general instead of local anesthetic
   d. all answers are correct

3. Impulses conducted by neurons are received by:

   a. stimuli
   b. axons
   c. cell body
   d. dendrites

4. People with cholinesterase deficiency should not be given which type of local anesthetic solution?

   a. amide
   b. ester

5. A 25-gauge needle has a diameter that is:

   a. larger than a 27 gauge needle
   b. smaller than a 27 gauge needle
   c. neither a nor b because gauge does not refer to diameter

6. Systemic toxic overdose reactions are virtually unknown with which topical:

   a. benzocaine
   b. procaine
   c. carbocaine
   d. lidocaine

7. When an injection damages a muscle resulting in limitation of muscle movement, the condition is known as:

   a. fasciculation
   b. tic douloureux
   c. paresthesia
   d. trismus

8. When an injection damages a nerve trunk causing a burning sensation and resulting in prolonged numbness, the condition is known as:

   a. neuralgia
   b. paresthesia
   c. trismus
   d. neuritis

9. When a patient is allergic to both ester and amide anesthetic agents, the drug with anesthetic properties that could be used is a (an):

   a. antibiotic agent
   b. anticoagulant agent
   c. antihistamine agent
   d. hypoglycemic agent

10. What is the treatment protocol if a patient has controlled hyperthyroidism?

    a. you should not use epinephrine
    b. you should not use any vasoconstrictor
    c. you should limit the amount of vasoconstrictor
    d. you should decrease the amount of local anesthetic to half the recommended dose

11. A patient allergic to lidocaine (xylocaine) should not receive which of the following related drugs as a local anesthetic:

    a. Procaine
    b. Propoxycaine
    c. Mepivacaine
    d. Tetracaine

12. When a local anesthetic solution containing epinephrine is mistakenly injected into a blood vessel, the patient demonstrates:

    a. watery saliva
    b. a slower heart rate
    c. an increase in blood pressure
    d. contraction of the muscles of mastication

13. Hematomas are most likely to occur with which of the following injections:

    a. PSA
    b. MSA
    c. ASA
    d. Greater Palatine

14. The drug of choice for the immediate treatment of an anaphylactic reaction to a local anesthetic is:

    a. morphine
    b. thiopental
    c. epinephrine
    d. pentobarbital

15. The zygomatic process is a landmark for the following injection:

    a. ASA
    b. PSA
    c. GP
    d. I/O

16. A message will travel at a much faster rate over nerves that are:

    a. peripheral nervous system nerves
    b. central nervous system nerves
    c. myelinated nerves
    d. non-myelinated nerves

17. Ways to prevent needle breakage include:

a. using a 25 gauge needle
b. never inserting the needle to the hub
c. being prepared for sudden movement of the patient
d. not redirecting the needle once it has been inserted into the tissue
e. all answers are correct

18. The nasopalatine nerve enters the oral cavity through the:

a. mental foramen
b. incisive foramen
c. nasopalatine foramen
d. greater palatine foramen

19. Epinephrine is the most potent and widely used vasoconstrictor used in dentistry.

a. true
b. false

20. The major cause of needle breakage is:

a. 30 gauge needles
b. sudden movement of the patient
c. use of stainless steel needles
d. redirecting the needle

21. A leaking syringe is most likely caused by:

a. failure to screw the needle down tightly
b. piercing the diaphragm off center
c. using a bad cartridge
d. none of the above

22. Which of the following teeth would require anesthetizing at least three nerve branches to provide adequate tooth and tissue anesthesia:

a. maxillary canine
b. mandibular second molar
c. maxillary central incisor
d. maxillary lateral incisor

23. A barbed needle may:

a. result from hitting a bone
b. may be produced during manufacturing process
c. cause pain on withdrawal
d. all answers are correct

24. Which of the following anesthetic agents typically adds Neo-Cobefrin to it?

a. Lidocaine
b. Mepivacaine
c. Prilocaine
d. Articaine

25. Indicate the nerve involved when anesthetizing the palatal gingiva of the maxillary 2nd premolar.

a. the long buccal nerve
b. the greater palatine nerve
c. the anterior superior alveolar nerve
d. the inferior alveolar nerve
e. the nasopalatine nerve

26. Indicate the nerve involved when anesthetizing the buccal gingiva of the mandibular first molar.

a. the long buccal nerve
b. the greater palatine nerve
c. the anterior superior alveolar nerve
d. the inferior alveolar nerve
e. the nasopalatine nerve

27. Indicate the nerve involved when anesthetizing the palatal gingiva of the maxillary canine.

a. the long buccal nerve
b. the greater palatine nerve
c. the anterior superior alveolar nerve
d. the inferior alveolar nerve
e. the nasopalatine nerve

28. Indicate the nerve involved when anesthetizing the maxillary canine.

a. the long buccal nerve
b. the greater palatine nerve
c. the anterior superior alveolar nerve
d. the inferior alveolar nerve
e. the nasopalatine nerve

29. A patient who refuses anesthesia and does not appear to have any discomfort during deep scaling and root planning is said to have a:

a. high pain threshold, low pain reaction
b. high pain threshold, high pain reaction
c. low pain threshold, high pain reaction
d. low pain threshold, low pain reaction

30. A nerve that has a resting potential is said to be:

a. polarized
b. depolarized
c. repolarized
d. refractory

31. The spread of a nerve impulse along a nerve fiber is termed a(n):

a. membrane channel
b. action potential
c. sodium pump
d. channel specificity

32. It is important to check the expiration date on an anesthetic cartridge as expired anesthetic is MOST likely to cause:

a. trismus
b. burning on injection
c. paresthesia
d. no ill effects

33. During repolarization, normal membrane potential is restored by:

a. the membrane becoming impermeable to sodium
b. the sodium pump getting rid of excess potassium
c. the potassium pump drawing in sodium
d. all of the above

34. Psychological methods of pain control include

a. TENS (EDA) and biofeedback
b. Hypnosis and biofeedback
c. Biofeedback only
d. Hypnosis only

35. A patient who is extremely nervous at each dental appointment and has not been receptive to any verbal reassurances may benefit from:

a. hypnosis
b. biofeedback
c. nitrous oxide sedation
d. relaxation therapy

36. Topical anesthetics are readily absorbed through the mucous membranes because they:

a. come in such high concentrations
b. can be inhaled
c. dilate blood vessels
d. irritate the mucosa

37. When the neuron is at rest (polarized), the electrical charge inside the axoplasm is at:

a. +70
b. - 70
c. +40
d. - 40

38. The mandibular division of the trigeminal nerve exits the cranium through:

a. foramen ovale
b. foramen rotundum
c. foramen lacerum
d. superior orbital fissure

39. The maxillary first molars are innervated by the:

a. ASA and PSA nerves
b. MSA and PSA nerves
c. ASA and MSA nerves
d. PSA and GP nerves

40. The landmark of significance for the inferior alveolar nerve block injection on the anterior border of the ramus of the mandible is the:

a. coronoid process
b. sigmoid notch
c. lingula
d. coronoid notch

41. Both maxilla and mandible receive their blood supply from the:

a. mandibular artery
b. internal carotid artery
c. maxillary artery
d. facial artery

42. The nerve which provides general sensation and taste to the tongue and mucous membranes of the floor of the mouth and the lingual gingiva is the:

a. inferior alveolar nerve
b. lingual nerve
c. long buccal nerve
d. mental nerve

43. In order to block the nerve impulse, anesthetic solution must be deposited to cover:

a. the nerve itself
b. 2-3 mm of the nerve
c. 6-8 mm of the nerve
d. 8-10 mm of the nerve

44. The premaxilla area is innervated by the:

a. pterygopalatine nerve
b. nasopalatine nerve
c. greater palatine nerve
d. maxillary nerve

45. All teeth, gingiva and periodontal ligaments are innervated by branches of the:

a. maxillary nerve
b. mandibular nerve
c. trigeminal nerve
d. all answers are correct

46. The primary effects of local anesthetics occur during the:

a. resting state
b. depolarization
c. repolarization
d. refractory period

47. The primary mechanism of action of local anesthetics is a(n):

a. increase in the permeability of the nerve membrane to sodium ions
b. increase in the permeability of the nerve membrane to calcium ions
c. decrease in the permeability of the nerve membrane to sodium ions
d. none of the answers are correct

48. The structure of the anesthetic molecule that determines whether it is an ester or an amide is the:

a. lipophilic part
b. intermediate chain
c. hydrophilic part
d. tertiary amine

49. One brand name for lidocaine is

a. articaine
b. citanest
c. xylocaine
d. carbocaine

50. A toxic overdose of a local anesthetic agent could result in:

a. tonic-clonic seizures
b. sedation
c. respiratory arrest
d. all answers are correct

51. The direct action that local anesthetics have on the heart is:

a. decrease in electrical excitability
b. decreased conduction rate
c. decreased force of contraction
d. all answers are correct

52. If a patient who is talking valium (Diazepam) daily has a local anesthetic administered, you may expect:

a. no adverse reaction
b. tonic-clonic seizures
c. a potential cardiorespiratory action
d. increased metabolism of the anesthetic

53. Inflamed tissues are difficult to anesthetize because:

a. dilated blood vessels will carry away the anesthetic
b. the pH of the tissues is too acidic
c. tissue fluids dilute the anesthetic solution
d. all answers are correct

54. When the pH of a solution has the same value as the pKa of a given local anesthetic agent:

a. half the drug exists in cationic form (RNH+) and half as a free base (RN)
b. there are more RNH+'s than RN's
c. there are more RN's than RNH+'s
d. none of the above

55. While ester's are biotransformed in the (liver / blood plasma), amide's are broken down in the (liver / blood plasma)

a. liver, liver
b. liver/blood plasma
c. blood plasma/blood plasma
d. blood plasma/liver

56. Patients with a familial history of methemoglobinemia should not be given:

a. prilocaine or lidocaine
b. lidocaine or mepivacaine
c. articaine or bupivacaine
d. prilocaine or benzocaine

57. A second aspiration is most critical in which of the following injections:

a. Inferior Alveolar
b. Greater Palatine
c. Middle Superior Alveolar
d. Long Buccal

58. Patients with a familial history of malignant hyperthermia should be thoroughly evaluated prior to the administration of:

a. any local anesthetics
b. nitrous oxide
c. ester local anesthetics
d. any general anesthetics

59. A 1.8 ml cartridge of lidocaine 2% contains:

a. 34 mg of anesthetic solution
b. 36 mg of anesthetic solution
c. 46 mg of anesthetic solution
d. 54 mg of anesthetic solution

60. The vasoconstrictor most commonly added to topical anesthetic solution is:

a. epinephrine
b. neocobefrin
c. norepinephrine
d. none are correct

61. In a cartridge of lidocaine 2% containing epinephrine 1:100,000, there are:

a. 1.9 mg/ml of epinephrine
b. 0.1 mg/ml of epinephrine
c. 0.01 mg/ml of epinephrine
d. 0.001 mg/ml of epinephrine

62. Aspiration in two planes is necessary to:

a. prevent the needle from entering a blood vessel
b. ensure that the bevel is facing the bone
c. reduce the internal pressure of the cartridge
d. ensure that the wall of a blood vessel is not drawn against the bevel during aspiration

63. If available, what would be an option for pain management of tooth # 11 and # 21 if an individual has trypanophobia;

a. C-Clad
b. Intra-nasal local anesthetic
c. buffered local anesthetic
d. tetradotoxin

64. The maximum safe dose for 2% Lidocaine 1:100,000 epinephrine as a local anesthetic for a 60 kg/120 lb patient is:

a. 6 cartridges
b. 8 cartridges
c. 11 cartridges
d. 13 cartridges

65. The reason why vasoconstrictors are added to local anesthetic solutions is to:

a. reduce bleeding
b. prolong anesthetic
c. slow absorption by the blood
d. all answers are correct

66. The topical anesthetic with the highest concentration is:

a. benzocaine
b. lidocaine
c. tetracaine
d. alphacaine

67. Alpha adrenergic receptors are mainly responsible for:

a. vasodilation
b. vasoconstriction
c. bronchodilation
d. cardiac stimulation

68. The recommended gauge of needle (in Malamed) for the Posterior Superior Alveolar (PSA) injection, in order to prevent needle breakage is the:

a. 30 gauge
b. 27 gauge
c. 25 gauge
d. 23 gauge

69. The **MAIN** complication of too rapid an injection is:

a. pain
b. burning
c. trismus
d. paresthesia

70. Sloughing of tissue is most commonly caused by:

a. rapid injection
b. prolonged application of topical anesthetics
c. trauma
d. careless technique

71. The most common intraoral postanesthetic lesion is:

a. recurrent aphthous stomatitis (RAS)
b. sterile abscess
c. herpes simplex virus
d. any of the above

72. Anesthetic overdose reactions occur as a result of:

a. intravascular injection
b. too rapid a rate of injection
c. careless technique
d. all the answers are correct

73. Talkativeness, excitability, slurred speech and elevated blood pressure, heart rate and respiratory rate are all indications of a(n):

a. allergic reaction
b. forthcoming seizure
c. toxic overdose
d. apprehensive patient

74. The possibility that the excitatory phase of toxic overdose reaction may be missing manifesting only signs of depression is most likely to occur with the administration of:

a. mepivacaine
b. articaine
c. lidocaine
d. etidocaine

75. Which of the following circumstances would be an ABSOLUTE contraindication to the use of vasoconstrictors?

a. allergic asthmatics
b. hyperthyroidism controlled with drugs
c. heart attack 8 months ago
d. blood pressure of 150/100

76. A patient who has been administered a local anesthetic agent suddenly complains of 'feeling sick', has severe abdominal cramps and feels nauseated is most likely experiencing:

a. toxic overdose
b. idiosyncrasy
c. a stage of anaphylaxis
d. anxiety

77. The safest and "easiest to handle" type of syringe used in dentistry is the:

a. pressure-type
b. breech loading aspirating
c. breech loading non-aspirating
d. breech loading self-aspirating

78. The most potent vasoconstrictor is:

a. levarterenol
b. levenordefrin
c. phenylephrine hydrochloride
d. epinephrine

79. Through the course of treating your patient, you have administered 3 cartridges of 2% lidocaine. This will be recorded on your chart as:

a. 54 mg
b. 72 mg
c. 108 mg
d. 135 mg

80. Three cartridges of 2% lidocaine containing 1:100,000 epinephrine have been administered. How many milligrams of epinephrine were given?

a. 0.018 mg
b. 0.036 mg
c. 0.045 mg
d. 0.054 mg

81. An anesthetic cartridge, after careful inspection, should be discarded if it has:

a. an extruded stopper
b. a corroded cap
c. larger bubbles
d. all the answers are correct

82. The harpoon syringe must be loaded in the following sequence:

a. needle, cartridge, engage harpoon
b. cartridge, needle, engage harpoon
c. cartridge, engage harpoon, needle
d. sequence doesn't matter

83. The most commonly used vasoconstrictors are classified as:

a. catechols
b. catecholamines
c. amides
d. esters

84. If a patient experiencing anaphylaxis is unable to breathe as evidenced by "crowing" noises he should immediately be administered:

a. 0.3 ml epinephrine I.M.
b. oxygen
c. 50 mg diphenhydramine I.M.
d. 100 mg hydrocortisone sodium succinate (solu-cortef)

85. Your patient presents with a history of hypertension which is currently very well controlled by the drug Inderal which is classified as a non-selective Beta-Blocker compound. Her blood pressure is 130/85. Since you will be doing some initial periodontal therapy with this patient requiring the use of a local anesthetic agent, which of the following would be your "safest" choice for this patient?

a. 2% Lidocaine HCL with 1:50,000 epi
b. 3% Mepivacaine Plain
c. 4% Articaine 1:200,000 epi
d. 4% Prilocaine Plain

86. The local anesthetic agent exerts its pharmacological effect at the:

a. synapse
b. nerve membrane
c. myelin sheath
d. all of the above

87. A person's unconscious feelings about "pain" are classified as :

a. cognitive factors
b. emotional factors
c. symbolic factors

88. You have a patient who has a complete upper denture and only lower anterior teeth remaining. She has indicated to you that she experiences extreme sensitivity during scaling and has always been anesthetized for her periodontal therapy. Which of the following injections would best meet her needs?

a. (R) right and left (L) Inferior Alveolars
b. R & L Inferior Aveolars and Linguals
c. R & L Mentals / Incisives
d. R & L Mentals and Linguals

89. You are treating the mandibular right arch and have previously administered an alveolar block injection, including a lingual and long buccal. You have not encountered any difficulties until you reach tooth #41 where the patient complains of sensitivity but indicates that tooth #31 feels numb. What has happened here?

a. bifid mandibular canal
b. crossover nerves
c. you missed the injection
d. the anesthetic is beginning to wear off

90. When crossover nerves exist in the area of # 41 and # 31, how would you manage a patient's pain if the anesthetic administered in Quad 4 does not provide adequate pain management for tooth
41.

a. re-inject the IA, L and Long Buccal
b. administer a mental injection on the right side
c. .infiltrate the buccal of #41
d. infiltrate both buccal and lingual of #41

91. The depth of penetration for the ASA injection is:

a. 1/4 of short needle
b. 1/3 of short needle
c. 1/2 of short needle
d. 3/4 of short needle

92. You are planning on scaling and root planning Sextant 6. You would administer which of the following injections:

a. PSA and MSA
b. IA, lingual and Long Buccal
c. Mental/Incisives
d. local infiltrations

93. The depth of penetration for the inferior alveolar injection is:

a. 1/4 of long needle
b. 1/2 of long needle
c. 1/3 of long needle
d. 3/4 of long needle

94. The amount of anesthetic to be deposited for an inferior alveolar block injection is:

a. 0.8 ml
b. 1.0 ml
c. 1.5 ml
d. 1.8 ml

95. The correct angulation for the PSA injection does not include:

a. 45 degrees above the occlusal plane
b. 45 degrees below the occlusal plane
c. 45 degrees from the mid-sagittal plane

96. Depth of penetration for the Mental / Incisive injection is:

a. 1/3 short needle
b. 1/2 short needle
c. 2/3 short needle
d. 4/5 short needle

97. The amount of anesthetic which you would deposit in the PSA injection is:

a. 1/4 cartridge
b. 1/3 cartridge
c. 1/2 to 3/4 cartridge
d. 1/3 to 2/3 cartridge

98. The MAJOR landmark for the PSA injection is the:

a. buccal of the last molar
b. mucobuccal fold
c. zygomatic process of maxilla
d. all of the above

99. The landmarks for the mental / incisive nerve injection are:

a. mandibular first and second premolars, mucobuccal fold
b. facial vestibule, mental foramen
c. mandibular 1st premolars, mucobuccal fold
d. facial vestibule, mandibular first premolars

100. The MRD for cardiac patients for the use of vasoconstrictors is

a. .01 mg/appointment
b. .04 mg/appointment
c. .1 mg/appointment
d. .4 mg/appointment