ORTHODONTICS

1. Excessive orthodontic force used to move a tooth may
   1. cause hyalinization.
   2. cause root resorption.
   3. crush the periodontal ligament.
   4. impair tooth movement.
   A. (1)(2)(3)
   B. (1) and (3)
   C. (2) and (4)
   D. (4) only
   E. All of the above.

   Ans E (Ref: page no 331, 348 Proffit 4/e)

Deleterious effects of Orthodontic Force:

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<th>Effects on the pdl</th>
<th>Causes hyalinization.</th>
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<td>Effects on the Height of Alveolar Bone</td>
<td>Height of Alveolar Bone decreases</td>
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<tr>
<td>Effects on the Pulp</td>
<td>There are occasional reports of loss of tooth vitality during orthodontic treatment.</td>
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<td>Effects on Root Structure</td>
<td>Heavy continuous orthodontic force can lead to severe root resorption.</td>
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2. Which of the following is/are correct?
   A. There is no histological difference between basal and alveolar bone.
   B. There is no difference in the response of basal and alveolar bone to pressure.
   C. Osteoid is a highly mineralized bundle bone.
   D. All of the above.

   Ans C (Ref: page no 331, 348 Graber Vanarsdall 3/e)

Lamellar bone

*Lamellar bone*, a strong, highly organized, well-mineralized tissue, makes up more than 99% of the adult human skeleton. When new lamellar bone is formed, a portion of the mineral component (hydroxylapatite) is deposited by osteoblasts during primary mineralization.

Secondary mineralization, which completes the mineral component, is a physical process (crystal growth) that requires many months. Within physiologic limits the strength of bone is directly related to its mineral content. 17,43 The relative strengths of different histologic types of osseous tissue can be stated thus: woven bone is weaker than *new* lamellar bone, which is weaker than *mature* lamellar bone. Adult human bone is almost entirely of the remodeled variety: secondary osteons and spongiosa. The full strength of lamellar bone that supports an orthodontically moved tooth is not achieved until approximately 1 year after completion of active treatment. This is an important consideration in planning orthodontic retention, as well as in the postoperative maturation period that follows orthognathic surgery.

Composite bone

*Composite bone* is an osseous tissue formed by the deposition of lamellar bone within a woven bone lattice, a process called *cancellous compaction*. This process is the quickest means of producing relatively strong bone. *Composite bone* is an important intermediary type of bone in the physiologic response to orthodontic loading, and it usually is the predominant osseous tissue for stabilization during the early process of retention or postoperative healing. When the bone is formed in the fine compaction configuration, the resulting composite of woven and lamellar bone forms structures known as *primary osteons*. Although composite bone may be high-quality, load-bearing osseous tissue, it eventually is remodeled into secondary osteons.

Bundle bone

*Bundle bone* is a functional adaptation of lamellar structure to allow attachment of tendons and ligaments. Perpendicular striations, called *Sharpey's fibers*, are the major distinguishing characteristics of bundle bone. Distinct layers of bundle bone usually are seen adjacent to the PDL along physiologic bone-forming surfaces. Bundle bone is the mechanism of ligament and tendon attachment throughout the body.

ORAL MEDICINE & RADIOLOGY

3. A Vitamin B₂ (Riboflavin) deficiency usually arises in patients
   1. who are elderly.
   2. with acute infection.
3. consuming a high protein or fat diet.
4. taking systemic antibiotics.
A. (1)(2)(3)
B. (1) and (3)
C. (2) and (4)
D. (4) only
E. All of the above.

Answer: - C

Assessment of riboflavin status
Biochemical tests are essential for confirming clinical cases of riboflavin deficiency and for establishing subclinical deficiencies. Among these tests:

- **Erythrocyte glutathione reductase activity:**
  Glutathione reductase is a nicotinamide adenine dinucleotide phosphate (NADPH), a FAD-dependent enzyme, and the major flavoproteins in erythrocytes. The measurement of the activity coefficient of erythrocyte glutathione reductase (EGR) is the preferred method for assessing riboflavin status. It provides a measure of tissue saturation and long-term riboflavin status. In vitro enzyme activity in terms of activity coefficients (AC) is determined both with and without the addition of FAD to the medium. ACs represent a ratio of the enzyme’s activity with FAD to the enzyme’s activity without FAD. An AC of 1.2 to 1.4, riboflavin status is considered low when FAD is added to stimulate enzyme activity. An AC > 1.4 suggests riboflavin deficiency. On the other hand, if FAD is added and AC is < 1.2, then riboflavin status is considered acceptable. Tillotson and Bashor reported that a decrease in the intakes of riboflavin was associated with an increase in EGR AC. In the U.K. study of Norwich elderly, initial EGR AC values for both males and females were significantly correlated with those measured 2 years later, suggesting that EGR AC may be a reliable measure of long-term biochemical riboflavin status of individuals. These findings are consistent with earlier studies.

- **Urinary riboflavin excretion:**
  Experimental balance studies indicate that urinary riboflavin excretion rates increase slowly with increasing intakes, until intake level approach 1.0 mg/d, when tissue saturation occurs. At higher intakes, the rate of excretion increases dramatically. Once intakes of 2.5 mg/d are reached, excretion becomes approximately equal to the rate of absorption (Horwitt et al., 1950). At such high intake a significant proportion of the riboflavin intake is not absorbed. If urinary riboflavin excretion is <19 µg/g creatinine (without recent riboflavin intake) or < 40 µg per day are indicative of deficiency.


4. **Radiographically, the opening of the incisive canal may be misdiagnosed as a**
   1. b.) nasal cyst.
   2. c.) nasopalatine cyst.
   3. d.) nasolabial cyst.
   4. e.) periradicular cyst.
   A. (1)(2)(3)
   B. (1) and (3)
   C. (2) and (4)
   D. (4) only
   E. All of the above.

Answer: - C

The incisive foramen (also called the nasopalatine or Anterior palatine foramen) in the maxilla is the oral terminus of the nasopalatine canal. It transmits the nasopalatine vessels and nerves (which may participate in the innervation of the maxillary central incisors) and lies in the midline of the palate behind the central incisors at approximately the junction of the median palate and incisive sutures. Its radiographic image is usually projected between the roots and in the region of the middle and apical thirds of the central incisors. The foramen varies markedly in its radiographic shape, size, and sharpness. It may appear smoothly symmetric, with numerous forms, or very irregular, with a well demarcated or ill-defined border. The position of the foramen is also variable and may be recognized at the apices of the central incisor roots, near the alveolar crest, anywhere in between, or extending over the entire distance. The great variability of its radiographic image is primarily the result of (1) the differing angles at which the x-ray beam is directed for the maxillary central incisors and (2) some variability in its anatomic size. Familiarity with the incisive foramen is important because it is a potential site of cyst formation. An incisive canal cyst is radiographically discernible: it frequently causes a readily perceived enlargement of the foramen and canal. The presence of a cyst is presumed if the width of the foramen exceeds 1 cm or if enlargement can be demonstrated on successive radiographs. Also, if the radiolucency of the normal foramen is projected over the apex of one central incisor, it may suggest a pathologic periapical condition. The absence of pathosis is indicated by a lack of clinical symptoms and an intact lamina dura around the central incisor in question. The lateral walls of the nasopalatine canal are not usually seen but on occasion can be visualized on a projection of the central incisors as a pair of radiopaque lines running vertically from the superior foramina of the nasopalatine canal to the incisive foramen.

5. The primary retention of a Class II gold inlay is achieved by
   1. adding an occlusal dovetail.
   2. increasing the parallelism of walls.
   3. lengthening the axial walls.
   4. placing a gingival bevel.

   A. (1)(2)(3)
   B. (1)and(3)
   C. (2) and (4)
   D. (4) only
   E. All of the above.


Cast metal intracoronal restorations rely primarily on almost parallel vertical walls to provide retention of the casting. The preparation walls must be designed maintaining parallelism with small angle of divergence (2-5 degrees per wall) that would enhance retention form. The degree of divergence needed primarily depends on the length of the prepared walls: greater the vertical height of the walls, the more divergence is permitted & recommended, but within the range described. Having sufficient length of these almost parallel walls allows enough frictional resistance & mechanical locking of the luting agent into minute irregularities of the casting & the preparation walls to counteract the pull of sticky foods.

In class II preparations involving only one of the two proximal surfaces, an occlusal dovetail may aid in preventing the tipping of the restoration by occlusal forces. When an unusually large amount of retention form is required, occlusal dovetail may be placed whether or not caries is on the occlusal surface.

Fig A shows primary retention form in class II tooth preparation for amalgam with vertical external walls of proximal & occlusal portions converging occlusally while fig B shows primary retention form for an inlay with similar walls slightly diverging occlusally.

6. A tooth preparation for a porcelain veneer must have a

   1. rough surface.
   2. space for the veneer material.
   3. definite finish line.
   4. margin at least 1mm supragingivally

   A. (1)(2)(3)
   B. (1)and(3)
   C. (2) and (4)
   D. (4) only
   E. All of the above


Intraenamel preparation before placing a veneer is strongly recommended for following reasons:
1. to provide space for opaque, bonding or veneering materials for maximal esthetics without overcontouring
2. to remove the outer, fluoride-rich layer of enamel that may be more resistant to acid-etching
3. to create a rough surface for improved bonding
4. to establish a definite finish line.

Whenever possible, margins should be placed supragingivally.
7. A 45 year old patient has 32 unrestored teeth. The only defects are deeply stained grooves in the posterior teeth. Clinical examination reveals no evidence of caries in the grooves. The treatment of choice is
A. application of pit and fissure sealants.
B. preventive resin restorations.
C. conservative Class I amalgams.
D. prophylactic odontotomy.
E. no treatment.


The ideal time to apply sealants is soon after occlusal surfaces erupt into the oral environment. However, sealants also are a common strategy for managing older patients whose risk for caries is increasing as a result of reduced saliva flow & more difficulty in maintaining good oral hygiene. Since in this case, patient is not v. old & has a low caries index, it is not logical to place sealants and no treatment is required.

ORAL SURGERY

8. Which of the following nerves should be anesthetized for the removal of a maxillary first molar?
1. Greater palatine.
2. Naso palatine.
3. Middle superior alveolar.
4. Anterior superior alveolar.
5. Posterior superior alveolar.
A. (1) (2)(4)
B. (0(3) (4)
C. (1)(3) (5)
D. (2)(3)(5)
E. (2) (4) (5)

Ans. C (ref. malamed 5th ed. Pg 193,196,203)
Middle superior alveolar nerve block anesthetize mesiobuccal root of maxillary first molar.

9. Patient nausea during nitrous oxide administration is an indication that the patient
A. is nervous.
B. has not eaten for some time.
C. is allergic to nitrous oxide.
D. has received the nitrous oxide too quickly

Ans. D (ref. Petersons 2nd ed. Pg.96)
Depending on the concentration and length of administration of laughing gas, four levels of sedation can be experienced (after an initial feeling of light-headedness):
1. a tingling sensation, especially in the arms and legs, or a feeling of vibration (“parasthesia”), quickly followed by warm sensations, and
2. a feeling of well being, euphoria and/or floating. During heavier sedation, hearing may dissolve into a constant, electronic-like throbbing.
3. At a deeper level of sedation again, sleepiness, difficulty to keep one’s eyes open or speak (“dream”) can occur. Should nausea set in, it means you’re definitely oversedated!

10. Which of the following is NOT a component of a dental cartridge containing 2% lidocaine with 1:100,000 epinephrine?
A. Methylparaben.
B. Water.
C. Sodium metabisulphite.
D. Sodium chloride

Ans. D (ref. malamed 5th ed.pg.320)

- Local anesthetic agent conducts blockade
- Vasoconstrictor: 1:10000 = 0.01mg/ml safe dose is 0.25 mg. so no more than 20 cc should be given.

Purpose: Vasoconstrictors are drugs that are added to LA to oppose vasodialatory actions of LA i.e.:
- Decrease blood flow to the site of administration
- Absorption of LA into CVS is slowed down
- Lowers blood levels of LA thereby minimizing risk of LA toxicity
- Increase duration of action
- Decrease bleeding at the site of administration

- Reducing agent: 0.5 mg/ml sodium metabisulfite.
- Preservative: 1 mg/ml methyl paraben.
- Fungicide: thymol.
- Salts: 5-6 mg NaCl to make it isotonic
- Vehicle: distilled water.