



School of Dentistry
Department of Restorative Dentistry

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RESTORATIVE DENTISTRY V (D553)
Mid-Term Examination
October 12, 2006

TEST CODE 02

INSTRUCTIONS

- Verify that you have an examination booklet with nine pages and fifty questions.
- Write your name on the computer answer sheet, as well as a nine digit personal identification number of your choosing in the field labeled "social security number", and blacken the appropriate circles with a #2 pencil. *Note: Test scores will be posted by PINs.*
- Sign and date the back of the computer answer sheet.
- **IMPORTANT!** Write the Test Code Number (above) on the computer answer sheet in the "Test Code" field under "Optional Codes", and blacken the appropriate circles.
- For each question answered, blacken the appropriate circle on the computer answer sheet corresponding to the letter of your choice.
- Students are not permitted to ask questions of the proctors during the examination. Do your best to answer each question with the information provided.
- When you have completed the examination, turn in your computer answer sheet. You may keep the question booklet.

1. Which of the following measures may reduce the tendency of a PFM fixed partial denture to flex under occlusal loading?

- a. use a metal alloy with the highest possible gold content ✗
- b. limit the span of the pontic space between the abutment crowns whenever possible ✓
- c. maximize the occlusogingival dimension of the pontics and connectors ✓
- d. two of the above
- e. a, b and c above

2. Which of the following are possible outcomes of flexure (elastic deformation) of a PFM fixed partial denture substructure?

- a. fracture of the veneering porcelain ✓
- b. failure of the cement seal of the abutment crowns ✓
- c. secondary caries involving the abutment teeth ✓
- d. two of the above
- e. a, b and c above

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3. All of the following recommendations concerning the sequencing of steps for crown fabrication are reasonable and prudent, EXCEPT which one?

- a. FIRST fabricate the burnout pattern for the cast post/core, THEN prepare the remaining natural tooth structure for the crown
- b. FIRST study the gingival unit and measure the gingival crevice, THEN initiate the tooth preparation for the crown
- c. FIRST prepare teeth #8 and #9 for PFM crowns, THEN install provisional crowns, delaying final margin placement and impression making until a subsequent visit ✓
- d. FIRST replace existing overextended and bulky PFM crowns #7-10 with correctly contoured provisional crowns, THEN provide appropriate periodontal therapy to optimize gingival health

4. Which of the following are considered important functions of a provisional crown?

- a. stabilize the prepared tooth in relation to the adjacent and opposing teeth ✓
- b. protect exposed vital dentin from oral stimuli ✓
- c. serve as a "3-dimensional blueprint" or morphological prototype for the final restoration ✓
- d. two of the above
- e. a, b and c above

5. If a defect extends into the biologic width and crown-lengthening is indicated prior to restoration, which one of the following surgical methods is most appropriate?

- a. apically repositioned flap with osseous reduction
- b. apically repositioned flap
- c. electrosurgery
- d. gingivectomy
- e. gingivoplasty

6. A 20 year old dental patient is caries-active, and the anatomic crown of tooth #2 has been destroyed to the level of the alveolar crest. Which one of the following plans would be most appropriate for this tooth?

- a. 3 mm of orthodontic extrusion followed by post/core and crown
- b. 2 mm of orthodontic extrusion, 2 mm of surgical crown lengthening, followed by post/core and crown
- c. 3 mm of surgical crown lengthening followed by post/core and crown
- d. 5 mm of surgical crown lengthening, followed by post/core and crown
- e. extraction

7. Which of the following are valid reasons for using a post in an endodontically treated posterior tooth?

- a. reinforce the root to reduce the risk of root fracture X
- b. strengthen the tooth to reduce the risk of crown fracture X
- c. enhance the retention of the core build-up ✓
- d. two of the above
- e. a, b and c above

8. In their discussion of restoration overhangs ("Interactions between the gingiva and the margins of restorations", J Clin Perio, 2003), Padbury, Eber and Wang present evidence that overhanging margins

- a. lead to alveolar bone loss because of chronic plaque accumulation ✓
- b. are associated with a plaque mass that contains a greater proportion of periodontal pathogens ✓
- c. are found in a significant proportion of dental restorations; 25% or more ✓
- d. two of the above
- e. a, b and c above

9. When "weighing" the benefits and risks of treatment alternatives for the replacement of missing teeth, which of the following factors must be taken into account?

- a. the effect of the treatment on the remaining natural teeth ✓
- b. the impact of the treatment on the periodontium ✓
- c. the esthetic potential of the treatment ✓
- d. two of the above
- e. a, b and c above

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10. Failing to correct significant irregularities of the occlusal plane (e.g., over-eruption of teeth) prior to fabricating a fixed partial denture may result in

- a. occlusal interferences (protrusive and lateral)
- b. weakness of the metal or ceramic substructure
- c. reduction in the periodontal ligament area of the abutment teeth
- d. two of the above
- e. a, b and c above

11. The primary reason for using a shoulder in a tooth preparation for a crown is to

- a. make room for the restorative materials
- b. improve retention and resistance
- c. increase the fracture resistance of the tooth structure
- d. protect the periodontium
- e. enhance the marginal seal

12. All of the following are compelling reasons to extend crown margins into the gingival crevice EXCEPT which one?

- a. to improve resistance and retention for short teeth ✓
- b. to place the margins in areas where plaque does not form
- c. to maximize the esthetic outcome of the crown
- d. to achieve an adequate ferrule for the crown

13. According to Goodacre and others ("Tooth preparations for complete crowns: an art form based on scientific principles", J Prost Dent, 2001), the axial walls of premolars prepared for crowns with a total occlusal convergence of 10-20° should be at least ____ mm long occlusogingivally for adequate resistance and retention.

- a. 3
- b. 4
- c. 5
- d. 6

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14. In the paper "Acquisition and transmission of mutans streptococci" (CDA Journal, 2003), Berkowitz argues that

- a. the later a child is infected with MS, the greater the caries risk later in life ~~X~~
- b. vertical transmission of MS may occur before the age of 2 years ✓
- c. MS cannot colonize the mouth of a pre-dentate child
- d. transmission of MS between young playmates is rare and inconsequential

15. In order to block the vertical transmission of mutans streptococci, oral health care providers should

- a. discourage siblings from sharing a toothbrush
- b. avoid transferring plaque from one tooth to another with a dental explorer
- c. prescribe a 5000 ppm fluoride toothpaste for children beginning at age 3
- d. attempt to therapeutically suppress oral mutans streptococci in mothers of neonates

16. A 24 year old female patient has 6 detectable caries lesions at the time of examination, including two in tooth #19: a mesial D1 lesion and a distal E1 lesion (as seen on a bitewing radiograph). She is educated and motivated to improve her oral health. Of the options presented here, the most appropriate restorative plan for tooth #19 is

M-DI
D-EI

- a. MOD amalgam or composite restoration
- b. MO amalgam or composite restoration using the "proximal slot" design, and an occlusal sealant
- c. separate MO and DO amalgam or composite restorations using the "proximal slot" design
- d. MO amalgam or composite restoration with extension into the occlusal fissures ~~X~~

17. Which one of the following dietary strategies intended to reduce caries risk is most likely to be BOTH effective AND practical?

- a. eliminate sucrose from the diet
- b. reduce the frequency of daily exposures to cariogenic food and drink
- c. replace all sucrose in the diet with xylitol
- d. increase the use of high fructose corn syrup

18. The initial focus of a minimally invasive treatment approach for a patient with small caries lesions is to

- a. use the proximal slot design for Class II cavity preparations
- b. seal occlusal fissures after performing controlled fissurotomy
- c. use adhesive materials wherever possible
- d. modify the existing oral conditions in order to inhibit bacterial activity and growth

19. The need for caries risk assessment is based on which one of the following fundamental principles?

- a. the disease is present long before caries lesions can be detected
- b. the level of mutans streptococci in the saliva alone is a valid predictor of future caries experience
- c. the disease is most prevalent in low socioeconomic groups
- d. everyone who has teeth has dental plaque

20. Which of the following choices would be a *reasonable application in routine clinical practice* of the findings of the Mertz-Fairhurst 10-year clinical trial of Class I amalgam and composite resin restorations ("Ultraconservative and cariostatic sealed restorations, JADA, 1998)?

- a. place all amalgam and composite restorations directly over undisturbed dentin caries lesions ✓
- b. place a glass ionomer liner under all new amalgam and composite restorations
- c. place restorations without removing the deepest carious dentin where there is a risk of pulp exposure ✓
- ☒ d. two of the above
- e. a, b and c above

21. When using a caries risk model to help manage a population of dental patients, possible consequences of ~~false negative~~ results include

- ☒ a. failure to provide adequate treatment for the disease
- b. unnecessary costs for preventive treatment
- c. fluorosis
- d. two of the above
- e. a, b and c above

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22. When chlorhexidine gluconate is prescribed as an oral rinse against mutans streptococci, the standard regimen is 10 ml once or twice daily for

- ☒ a. 2-3 weeks
- b. 2-3 months
- c. 5-6 months
- d. 1 year (minimum)

23. "Preservative" guidelines for the treatment of Class II caries lesions are based on the principle that caries lesions

- a. that affect dentin cannot be arrested
- b. that penetrate the dentin spread laterally at the DEJ
- c. should be removed in their entirety prior to restoration
- ☒ d. are generally more extensive than they appear on radiographs
- ☒ e. with an intact enamel surface are amenable to remineralization

24. Compared to sorbitol, xylitol is *less*

- a. sweet ✗
- b. expensive ✗
- ☒ c. cariogenic
- d. two of the above
- e. a, b and c above

25. Which of the following, according to Burt ("The use of sorbitol and xylitol sweetened chewing gum in caries control", JADA, 2006), are mechanisms by which gum sweetened solely with xylitol exerts a cariostatic effect?

- a. replacement of fermentable carbohydrate by a non-fermentable polyol
- b. inhibition of mutans streptococci growth
- c. stimulation of saliva production
- ☒ d. two of the above
- ☒ e. a, b and c above

26. Delaying surgical intervention for some Class II caries lesions discovered on bitewing radiographs may be justified for which of the following reasons?

- a. some caries lesions visible on dental radiographs may be inactive ✓
- b. active caries lesions of enamel usually progress at a slow rate ✓
- c. of those caries lesions that appear radiographically to be confined to enamel, a significant proportion probably have an intact enamel surface (i.e., are not cavitated) ✓
- d. two of the above
- e. a, b and c above

→ 27. In the study by Hildebrandt and Sparks ("Maintaining mutans streptococci suppression with xylitol chewing gum", JADA, 2000), three study groups were assembled: "test group" (CHX, followed by xylitol gum); "placebo group" (CHX, followed by gum sweetened with sorbitol, aspartame and saccharine); "control group" (CHX only, no gum). The placebo group was included in order to,

- a. compare the cariostatic benefits of xylitol to other sweeteners that are thought to be less effective
- b. determine to what extent CHX can suppress mutans streptococci below baseline levels
- c. help assess the role of saliva stimulation in the outcome
- d. two of the above
- e. a, b and c above

28. These enzymes protect the dentition by destroying and inhibiting the growth of pathogenic bacteria and promoting clearance by aggregation.

- a. gustin and amylase
- b. mucins
- c. statherine, histatins, cystatins
- d. lactoferrin and lysozyme

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→ 29. These pellicle proteins aid the growth of apatite crystals during remineralization and limit the loss of mineral during periods of low plaque pH

- a. gustin and amylase
- b. mucins
- c. statherine, histatins, cystatins
- d. lactoferrin and lysozyme

30. In his paper, "Fluoride and social equity" (J Public Health Dent, 2002), Burt argues that fluoridation of community water is a policy that should be continued and expanded. What is the basis for his argument?

- a. 25% of American children between the ages of 6 and 17 account for 80% of the caries experience
- b. caries risk assessment can be employed to differentiate between low and high risk patients
- c. disparities in caries experience exist along socioeconomic lines, which can only be reduced with a widely-applied fluoridation effort
- d. the cariostatic benefits of water fluoridation are derived mainly from the topical (post-eruptive) effects

31. Perhaps the most logical reason for opposing community water fluoridation in the US is that it

- a. is likely to result in a higher prevalence of mild to moderate dental fluorosis in children
- b. causes osteogenic sarcoma
- c. leads to a crippling bone defect called skeletal fluorosis
- d. is expensive compared to other methods of cariostasis
- e. is anti-democratic

32. A significant disadvantage of chlorhexidine (CHX) when used to suppress oral mutans streptococci (MS) levels is that

- a. CHX exhibits poor substantivity ✗
- b. CHX promotes the growth of drug-resistant strains of bacteria during the treatment interval
- c. oral MS are resistant to CHX therapy ✗
- d. suppression is temporary, so periodic re-treatment is required

33. CPP-ACP is a remineralizing compound found in some oral care products. The first "C" stands for

- a. casein
- b. chelated
- c. combined
- d. calcium
- e. crystalline

34. The dental apatite impurity that is believed to be most significant in rendering enamel crystallites susceptible to acid dissolution is

- a. fluoride
- b. phosphate
- c. carbonate
- d. magnesium
- e. chloride

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35. Fluoride acts to promote remineralization after an acid challenge by

- a. reacting with and neutralizing hydrogen ions
- b. accelerating the formation of apatite precursor molecules from free calcium and phosphate ions
- c. inhibiting bacterial enzymes, such as ATPase and enolase
- d. adsorbing onto DAP crystal surfaces and protecting them from hydrogen ions

36. According to research findings summarized by Lussi and others ("DIAGNOdent: an optical method for caries detection", J Dent Res, 2004), the specificity of DIAGNOdent is consistently

- a. higher than sensitivity
- b. lower than sensitivity
- c. equal to sensitivity
- d. none of the above; the relationship between specificity and sensitivity varies widely depending on the research method

37. The DIAGNOdent works by detecting

- a. fluorescence of bacterial metabolites
- b. opacification of carious enamel
- c. increased dentin permeability
- d. reduced electrical resistance of demineralized dentin

38. A significant reason why practitioners should be cautious about using self-etching adhesive systems is that these materials

- a. exhibit low bond strengths to enamel and dentin *in vitro*
- b. are relatively new, and clinical efficacy has not yet been scientifically proven
- c. do not form a hybrid layer
- d. are more technique sensitive than the total-etch (etch and rinse) systems

39. When a typical dentin sample is exposed to 35% phosphoric acid for 15 seconds, then rinsed, what is the direct result?

- a. the smear layer is completely removed, including the smear plugs in the dentinal tubules ✓
- b. dental apatite crystals are dissolved and removed to a depth of several (about 2-5) microns ✓
- c. a hybrid layer is formed
- d. two of the above
- e. a, b and c above

40. The most serious flaw of GV Black's principles of cavity preparation is the

- a. lack of rational procedural order
- b. over-emphasis of marginal form and finish
- c. weakening of teeth through excessive preparation
- d. improper management of the caries lesion

41. The first dental material to exhibit true chemical adhesion to tooth structure was

- a. silicate cement
- b. zinc phosphate cement
- c. glass ionomer cement
- d. zinc polycarboxylate cement

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42. The bond between glass ionomer materials and tooth structure can best be described as a

- a. complex ionic bond characterized by an ion-exchange layer
- b. metallic bond involving aluminum and strontium
- c. network of calcium-silicon and calcium-aluminum atomic bonds
- d. micromechanical entanglement of collagen and silica hydrogel

43. The clinical applications of glass ionomer and resin-modified glass ionomer materials are limited primarily by their

- a. poor adhesion to tooth structure
- b. viscosity and handling properties
- c. biocompatibility
- d. esthetic qualities
- e. mechanical strengths and wear resistance

44. For which one of the following clinical applications would glass ionomer materials be most clearly indicated?

- a. pit and fissure sealants
- b. Class II restorations in permanent teeth
- c. Class V restorations in caries-active patients
- d. large core build-ups for metal and ceramo-metal crowns

45. When using a total-etch (etch and rinse) adhesive, the most effective way to remove excess water after rinsing is to

- a. blot with a moist cotton pellet
- b. dry the surface with the air syringe
- c. apply a 7% solution of acetone with a micro sponge
- d. place the high volume suction tip directly over the prepared tooth

46. Which one of the following is a compelling reason to replace an existing amalgam restoration?

- a. narrow ditching of occlusal margins
- ☒ b. a fracture line at the isthmus of a MOD restoration
- c. corrosion of the exterior surfaces of the restoration
- d. a beginning caries lesion at an accessible margin of a deep MODFL restoration

47. All of the following statements about fluoride-releasing dental materials are supported by research findings EXCEPT which one?

- a. during an acid challenge, glass ionomers promote remineralization by mobilizing and releasing fluoride ion into the local environment ✓
- b. glass ionomers and other F-releasing materials increase the fluoride content of adjacent tooth structure ✓
- ☒ c. the rate of fluoride release from glass ionomers is highest during the initial setting reaction, then decreases to zero in about two years
- d. long-term fluoride release of traditional glass ionomers tends to be greater than resin-modified glass ionomers, which tends to be greater than the fluoride-releasing composite resins (e.g., compomers)
- e. F-releasing materials elevate salivary and plaque fluoride levels, which adversely affects bacteria

48. During her first visit to Temple University School of Dentistry, Mrs. Jones reveals that she is "allergic to latex". Although she states she never talked to a physician about it, she knows she has an allergy to latex because she broke out with a red rash around her mouth after being examined by a previous dentist.

Which one of the following statements about Mrs. Jones' condition is true?

- a. she is allergic to one or more proteins from the plant *Havea brasiliensis*
- b. an accurate diagnosis can be made by taking a thorough medical history
- ☒ c. her rash was a delayed (Type IV) hypersensitivity reaction
- ☒ d. the best way to diagnose or rule out a latex allergy is with skin prick testing
- e. her rash was a non-immunological reaction, such as irritant dermatitis

49. Replacement of restorations due to a diagnosis of secondary caries should decrease if

- a. the prevalence of dental caries continues to decrease ✓
- b. better adhesives are developed that permit a durable marginal seal ✓
- c. better diagnostic methods are developed that exhibit higher specificity ✓
- ☒ d. two of the above
- e. a, b and c above

50. Which one of the following statements about rubber dam isolation (RDI) is indisputably true?

- a. RDI significantly increases the life expectancy of occlusal sealants
- b. RDI reduces the rate of post-operative sensitivity with composite resin restorations
- ☒ c. RDI utilization for Class II composite resin restorations exceeds 90% in the US
- d. RDI is an effective means of minimizing the risk of contamination during bonding procedures

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