LESSON ASSIGNMENT

LESSON 3
Oral Prophylaxis.

LESSON OBJECTIVES
After completing this lesson, you should be able to:

3-1. Identify what oral prophylaxis is.

3-2. Identify a typical setup of instruments and materials used to scale and polish teeth.

3-3. Identify detection instruments and scaling instruments.

3-4. Identify information related to dental prophylaxis equipment, especially the ultrasonic dental unit.

3-5. Identify methods of grasping a scaling instrument.

3-6. Identify preventive dental specialist positions and finger rests used in scaling each of ten tooth surfaces.

3-7. Identify information related to polishing.

3-8. Identify the ways that fluorides are applied.

3-9. Identify topical fluoride solutions.

3-10. Identify information related to occlusal sealants and prophylaxis paste.

SUGGESTION
After studying the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.
LESSON 3

ORAL PROPHYLAXIS

Section I. INSTRUMENTS AND EQUIPMENT

3-1. GENERAL

In its broadest sense, the term "oral prophylaxis" encompasses all procedures done in the mouth contributing to oral and dental health through prevention of disease. As used in dentistry, the term refers to scaling and polishing procedures which remove calculus, other deposits, and stains from the teeth. To perform scaling and polishing procedures properly, the preventive dentistry specialist must understand dental and periodontal tissues and how they react to various irritations and treatments. The PDS must be familiar with the appearance and texture of normal oral tissue and be able to recognize disease. He must be observant and call attention to any condition not recorded, but which should be examined by the dental officer. The PDS must also be thoroughly familiar with the instruments and techniques of instrumentation in performing scaling and polishing procedures. A good oral prophylaxis is one in which the teeth have been scaled and polished with the least trauma to tissues and restorations and the least discomfort to the patient. Furthermore, topical fluoride solutions should be applied to the teeth of all patients unless contraindicated.

3-2. PREOPERATIVE PREPARATIONS

The preventive dental specialist follows standard procedures in preparing for and handling of patients. Personal cleanliness, cleanliness and orderliness of the treatment room, sterilization of instruments, maintenance records, appointment scheduling, care and maintenance of equipment, and consideration and courtesy in handling patients are all important to the successful functioning of the oral hygiene service. Before each new patient is admitted to the treatment room, all evidence of treatment of the previous patient should be removed, used instruments and materials cleaned and placed in the sterilizer or put away, soiled linens and paper covers replaced, instrument setups for the next patient prepared, and the dental chair lowered and adjusted for easy access by the patient. After the patient has been seated, the chair adjusted, and the protective towel put in place, the PDS should wash and dry his hands in full view of the patient before beginning any procedure.

3-3. INSTRUMENTS AND MATERIALS

a. Typical Instrument Setup. A typical setup of instruments and materials used to scale and polish teeth is shown in figure 3-1. (Notice that gloves, a face mask, and protective glasses are included. The PDS is expected to put them on before using any of the instruments.) A toothbrush and a model set of teeth are used to demonstrate correct toothbrushing methods.
b. Parts of an Instrument. Instruments used in scaling have three common parts (see figure 3-2). The handle is used for holding the instrument. The shank connects the handle to the working end. The working end does the actual work of the instrument. The working end is divided into the face, lateral sides, back, and tip.
3-4. DETECTION INSTRUMENTS

Instruments designed for detecting tooth irregularities are essential for scaling procedures.

a. **Mirror.** A mirror is used to obtain better vision of oral structures and for tissue retraction, both of which will allow for a more proficient examination of oral tissue and detection of supragingival deposits.

b. **Explorer.** Explorers are manufactured in various shapes and sizes. Selection is based on need in a particular situation. Explorers are used to detect calculus, caries, abnormalities and irregularities of teeth and to examine contours of restorations.

c. **Periodontal Probe.** The periodontal probe is an instrument of evaluation and is never used to remove or dislodge dental deposits. Its primary use is for measurement of sulcus and pocket depths.

3-5. SCALING INSTRUMENTS

Instruments designed to remove calculus are called scalers. Several different scaling instruments are designed to reach the various surfaces of the teeth during calculus removal. A variety of scalers are available as standard medical supply items for dental use.

a. **Sickle Scalers.** Sickle scalers are used to remove supragingival calculus. Sickle scalers are useful for gross calculus removal slightly below the gingival margin and when the tissue is flexible enough to permit easy insertion of the instrument. Sickle scalers can produce undue trauma, are not easily adapted to curved surfaces, and can decrease tactile sensitivity. Commonly used sickle scalers (figure 3-3) are listed below.

   (1) Sickle Scaler U 15-33.

   (2) Sickle Scaler Jaquette 34-35.

   (3) Jacquette 21S-33.

   (4) McCall's 13S-14S
b. **Universal Curettes.** Universal curettes are used in all areas of the mouth. These instruments are characterized by their curved blade which makes adaptation to the tooth surface much easier. Commonly used universal curettes (figure 3-4) are listed below.

(1) Younger-Good 7-8.

(2) Colombia 13-14.
c. **Gracey Curettes.** Gracey curettes are used to remove subgingival calculus deposits. The shape of the blade makes subgingival adaptation possible without trauma to the adjacent tissue. Each instrument in this series (see figure 3-5) is designed for a specific region of the mouth.

1. Gracey 1-2--Anterior teeth, and facial, lingual, mesial, and distal surfaces of all teeth.

2. Gracey 7-8--Anterior teeth, plus facial, lingual, mesial, and distal surfaces of bicuspid.


![Gracey Curettes](image)

Figure 3-5. Gracey curettes.

**3-6. ULTRASONIC DENTAL UNIT**

a. **General.** The ultrasonic dental unit is widely used to perform oral prophylaxis treatments. See figure 3-6. The unit works by converting alternating current into 25,000-cycle current. The unit handpiece converts electrical power supplied by the unit's generator into 25,000 microscopically small mechanical strokes. These strokes are transmitted to the insert tip. A continuous flow of water is required to cool the handpiece. The same water, warmed inside the handpiece, is delivered through the nozzle and sprayed at the activated tip. Using a very light guided touch, the activated tip with the bubbling action of the water rapidly dislodges calculus and stain.
b. **Operation.** The ultrasonic unit should be operated according to the manufacturer’s instructions. The technique to be used in performing an oral prophylaxis with ultrasonic equipment is similar to that for hand scaling instruments. Two exceptions are that application must be in a continuous wet field and that the insert tip must be kept moving constantly to avoid damage to tooth structure. The various insert tips available for use in the ultrasonic unit are shown in figure 3-7. (Insert tips need not be sharp to perform effectively.) All of these tips have a specific use, but the P10 is the tip most commonly employed. For repair or service, users should request assistance of the medical equipment repairman.

![Figure 3-6. Ultrasonic dental unit.](image)

![Figure 3-7. Handpiece and insert tips for ultrasonic dental unit.](image)

c. **Precautions.** Although the unit requires no special maintenance, the following precautions should be observed.

   (1) **Heat damage.** The unit should not be placed on or next to a radiator or other heat source. Heat may damage its electronic components.
(2) **Air circulation.** The unit should be placed where a normal amount of air circulates freely on all sides of the cabinet. It should not be in a tightly confined space or corner.

(3) **Careful handling.** The unit should be handled carefully when carried from one place to another.

(4) **Warning.** The unit must not be used on patients with cardiac pacemakers. The high frequency level may interfere with the rhythm of the pacemaker.

3-7. **OTHER EQUIPMENT**

a. **Dental Unit Sonic Scaler.** The dental unit sonic scaler fits all standard 2-line, 3-line, and 4-line couplers. The sonic scaler is handled like a slow-speed handpiece. It is more convenient because no water lines or other unit is needed. The sonic scaler is gradually replacing the ultrasonic units and will be incorporated into the dental field equipment.

b. **Air Polishing Prophylaxis Unit (Prophy Jet).** This instrument may be used to remove stains. Because of the sensitivity of teeth and gingiva to air pressure, this instrument should only be used by a preventive dentistry specialist who is trained in its usage.

Section II. **PROPHYLAXIS PROCEDURE**

3-8. **GRASPING AND USING SCALING INSTRUMENTS**

a. **Control of Instrument.** In the hands of an inexperienced preventive dentistry specialist, a scaling instrument can be very harmful to hard and soft tissues as well as dental restorations. Removing calculus without damaging the tissues requires knowledge of dental anatomy and of the nature and relationship of gingival attachment to the tooth. It also requires complete control of the instrument during the placement and scaling stroke. In placing and withdrawing the instrument, the PDS must keep the scaling edge in contact with the hard structures. The contact of the instrument to a tooth should be firm, but not so firm that it gouges or damages tooth structure or restorations. The scaling stroke should be directed away from soft tissue wherever possible and not permitted to slip or veer. The range of movement of the blade of the instrument during the scaling stroke should be limited to that required for removing deposits. This means that the PDS must have positive control of the instrument all the time. This control is possible only if the instrument is held properly and the PDS's fingers are firmly anchored and supported against the patient's jaws or teeth.
b. **Grasping the Instrument.**

(1) **Pen grasp and modified pen grasp.** Two methods of grasping a scaling instrument afford control during the scaling stroke (see figure 3-8). The two methods are the pen grasp and the modified pen grasp in which the thumb, index finger, and middle finger hold the instrument. In using either grasp, the PDS should hold the instrument well up on the working edge of the handle, supporting the fingers against the teeth and using them as fulcrums during the scaling stroke. With the pen grasp, the two last fingers are used as the fulcrum. Additional control may be gained by bringing fingers of the other hand into play to help guide or support the instrument.

![Pen Grasp and Modified Pen Grasp](image)

Figure 3-8. Methods of grasping scaling instruments.

(2) **The palm grasp.** Another method, the palm grasp, used with the Porte Polisher, air, water syringe, and other such instruments is accomplished by holding the instrument with the index, middle, ring, and little finger so it rests in the palm of the hand. The thumb remains free to stabilize the hand in the patient’s mouth.

c. **Scaling Motions.** A standard scaling instrument is used by sliding it over the surface of the tooth and calculus to the base of the deposit. Then, the instrument is pulled toward the occlusal or incisal surface, maintaining firm contact with the tooth surface and flaking or scraping off calculus ahead of it.

d. **Tactile Sense.** In working on lingual and proximal surfaces, the PDS often cannot see well enough to determine the presence and the extent of calculus. In this case, the PDS must depend upon his tactile sense, which is the feel transmitted to the fingers by the instrument. The experienced PDS will be able to detect calculus and remove it even though he cannot see it. An explorer is excellent for determining the presence of small areas of calculus not detectable by the bulkier scalers and for checking if there is any calculus left on the teeth (see figure 3-9).
3-9. GUIDANCE IN THE USE OF SCALING INSTRUMENTS

a. **Grasp.** The most common grasp used in holding a dental instrument is the modified pen grasp. The modified pen grasp should be accomplished in the following manner.

(1) Thumb and forefinger hold the instrument with finger pads contacting instrument.

(2) Thumb and forefinger should be opposite each other at or near the junction of the shank and handle.

(3) Pad of the middle finger should be placed on the shank.

(4) Ring finger remains free to establish fulcrum.

(5) Use a light relaxed grasp.

b. **Finger Rest.** Establishing a finger rest is a major factor in maintaining instrument stability during scaling procedures. An effective finger rest should meet the following criteria:

(1) Place the finger rest using the pad of the ring finger.

(2) Establish finger rest as close to the working area as possible.

   (a) Should be on the same arch.

   (b) Should be close to the tooth being worked on.
c. **Required Set of Motions.** To obtain maximum strength and control from scaling strokes, a specific set of motions are performed to activate the blade of the instrument.

1. Grasp the instrument using a modified pen grasp.
2. Establish a finger rest on an adjacent tooth.
3. Rotate your wrist as you would in turning a door knob.
4. Wrist and arm are used for strength, not the fingers.

d. **The Scaling Process.** Let's go back now and put the steps of the scaling process together.

1. Pick up the instrument and hold it using the modified pen grasp.
2. Practice rolling the instrument between the thumb and forefinger.
3. Select the tooth to be scaled and establish a finger rest.
4. Place the tip of the instrument beneath the deposit to be scaled. Be sure the tip of the instrument remains in contact with the tooth surface at all times.
5. Tighten grasp slightly and apply lateral pressure against the tooth surface with the cutting edge.
6. Activate the instrument using rotary motion activation. Move the instrument in a coronal direction, always leading with the tip.
7. As deposits are removed, readapt the instrument and reactivate.

### 3-10. SCALING SEQUENCES

In scaling and polishing a patient's teeth, the PDS should follow a sequence of steps. This sequence of steps will enable the PDS to know what sections of the mouth have been scaled and polished. This sequence will also prevent overlooking the scaling or polishing of any teeth and unintentional rescaling or repolishing of teeth. One sequence often used is to work in the same order that teeth are numbered. For example, the first surfaces scaled are the facial and proximal surfaces of the maxillary right posterior teeth, beginning with the third molar (tooth number 1). This is followed by the lingual surfaces of the same teeth. Then, the maxillary anterior, the maxillary left posterior, the mandibular left posterior, the mandibular anterior, and the mandibular right posterior teeth are done in turn. In each group, scaling of the facial and proximal surfaces is followed by scaling of the lingual surfaces. When scaling is completed, the teeth are polished in the same sequence.
3-11. SCALING THE TEETH

In scaling the facial, proximal, and lingual surfaces of each segment of the dental arches, certain instruments and positional relationships of the PDS to the patient are more convenient than others. Some procedures can be done better with a mouth mirror. In any case, the chair should be adjusted so that the patient's head is at a convenient working height (generally between the PDS's elbows and shoulders). The patient should be comfortable. All areas of the mouth should be easily accessible for effective work to be done. Adjusting the operating lamp for good working visibility, maintaining a neatly arranged bracket table, and keeping instruments wiped free of debris are also conducive to efficient work performance. An excellent time to instruct the patient in proper toothbrushing and other self-care practices is just before beginning the prophylaxis. With the use of disclosing solution and a hand mirror, areas needing attention can be pointed out. Scaling procedures are then carried out as discussed below using instruments convenient to each area. With experience, the PDS will find that certain instruments become favorites while others are seldom used.

3-12. PDS POSITIONS USED FOR SCALING

The working positions used by the PDS for scaling and polishing are identified in relation to the patient, usually using the concept of a 12-hour clock face. See figures 3-10 and 3-11. A right-handed PDS generally uses the 9 o'clock position to scale posterior teeth; a left-handed PDS uses the 3 o'clock position. A right-handed PDS uses the 8 o'clock position to scale tooth surface sides toward the PDS; a left-handed PDS uses the 4 o'clock position. Both right-handed and left-handed PDS's use the 12 o'clock position to scale tooth surface sides away from the PDS. Appendix D provides a chart outlining suggested PDS positions and finger rests used in scaling, from a right-handed perspective.
Figure 3-10. PDS positions used in scaling and polishing (right-handed perspective).

Figure 3-11. PDS positions used in scaling and polishing (left-handed perspective).
3-13. SEQUENCE OF PROCEDURE

a. Maxillary Right Posterior. In scaling the facial and proximal surfaces of maxillary right posterior teeth, the PDS is usually at the 9 o'clock position in relation to the patient. See figure 3-12. The fingers rest on the lingual surfaces of these teeth. In scaling the lingual surfaces of the maxillary right posterior teeth, the PDS is to the right of the patient at the 9 o'clock position, and uses a mouth mirror for light and vision. The fingers rest on the occlusal surfaces of adjacent teeth.

b. Maxillary Anterior. For the maxillary anterior teeth, the PDS is behind the patient at the 12 o'clock position, when scaling the facial, proximal, and lingual surfaces, sides away from the PDS. See figure 3-13. The PDS is at the 8 o'clock position to the patient, when scaling the facial, proximal, and lingual surfaces, sides toward the PDS. See figure 3-14. The fingers rest on the linguoincisal edges of adjacent teeth. In scaling the lingual surfaces, the PDS needs to use a mouth mirror for light and vision.

c. Maxillary Left Posterior. In scaling the facial and proximal surfaces of maxillary left posterior teeth, the PDS is usually at the 9 o'clock position in relation to the patient. See figure 3-12. The fingers rest on the occlusal surfaces of these teeth. In scaling the lingual surfaces of these teeth, the PDS is to the right of the patient at the 9 o'clock position, and uses a mouth mirror. The fingers rest on the facial or occlusal surfaces of the maxillary teeth.

d. Mandibular Left Posterior. In scaling the facial, lingual, and proximal surfaces of mandibular posterior teeth, the PDS is usually to the right of the patient at the 9 o'clock position. See figure 3-15. The fingers rest on the occlusal surfaces of adjacent teeth. In scaling the lingual surfaces of these teeth, the PDS is usually at the 9 o'clock position. The fingers rest on the occlusal surfaces of these teeth. A mouth mirror is needed for tongue retraction, but not for light and vision.

e. Mandibular Anterior. For the mandibular anterior teeth, the PDS is behind the patient at the 12 o'clock position, when scaling the facial, proximal, and lingual surfaces, sides away from the PDS. See figure 3-16. The fingers rest on the facial surfaces of these teeth. The PDS is to the right of the patient at the 8 o'clock position, when scaling the facial, proximal, and lingual surfaces, sides toward the PDS. See figure 3-17. The fingers rest on the lingual surfaces of these teeth. In scaling the lingual surfaces, the PDS needs to use a mouth mirror for light and vision.

f. Mandibular Right Posterior. In scaling the facial, proximal, and lingual surfaces of mandibular right posterior teeth, the PDS is at the 9 o'clock position to the right of the patient. See figure 3-15. The fingers rest on the occlusal surfaces of these teeth. In scaling the lingual surfaces, the PDS needs to use a mouth mirror.
Figure 3-12. Positioning for maxillary posterior teeth.

Maxillary Left Posterior Teeth, Facial and Proximal Surfaces
Maxillary Right Posterior Teeth, Lingual Surfaces

PDS position: 9 o’clock

Maxillary Right Posterior Teeth, Facial and Proximal Surfaces
Maxillary Left Posterior Teeth, Lingual Surfaces

PDS position: 9 o’clock
Figure 3-13. Positioning for maxillary anterior teeth, sides away from the PDS.
Figure 3-14. Positioning for maxillary anterior teeth, sides toward the PDS.
Figure 3-15. Positioning for mandibular posterior teeth.
Figure 3-16. Positioning for mandibular anterior teeth, sides away from the PDS.
Facial and Proximal Surfaces, Sides Toward

PDS position: 8 o’clock

Lingual Surfaces, Sides Toward

PDS position: 8 o’clock

Figure 3-17. Positioning for mandibular anterior teeth, sides toward the PDS.
3-14. POLISHING

a. General. When all calculus deposits have been removed, the teeth can be polished. This is done the same way a jeweler polishes jewelry, using a fine abrasive. The abrasive used to polish teeth is a powder called zirconium silicate.

b. Procedure. The polishing agent is applied to the teeth with a small rubber cup, using the contra-angle handpiece or the straight shaft handpiece and a disposable prophyhead. See figure 3-18. Firm finger rests must be used at all times during the polishing procedure. The rubber cup must be kept well-filled with paste and the dental engine set to rotate slowly so as to avoid tissue injury and to prevent overheating the tooth. After readily accessible surfaces of the teeth are polished, the proximal surfaces should be polished with the paste, using unwaxed floss or tape as the carrier, to remove the polishing paste from the interproximal spaces.

Figure 3-18. Polishing the teeth.

Section III. FLUORIDES AND PROPHYLAXIS PASTE

3-15. APPLYING FLUORIDES - GENERAL

Fluorides applied in various ways will markedly reduce the incidence of dental caries. The most effective results are derived from incorporating fluoride in the drinking water. Administering supplemental systemic fluoride and topical applications of fluoride solutions, prophylaxis pastes, and fluoride toothpastes are also beneficial.
3-16. COMMUNITY WATER FLUORIDATION

The most effective of all dental public health measures is fluoridation of community water supplies. A 65 percent reduction in dental decay can be produced by water fluoridation. The optimum level of fluoride in water is one part fluoride in one million parts of water (one part per million (ppm)). This concentration may vary from 0.7 to 1.2 ppm depending on the mean daily temperature of the area being considered. Simply, more water is consumed in warmer climates. Therefore, less fluoride in the water is needed than in cooler climates. The protection produced by a continuous consumption of water lasts a lifetime. Studies show that 50 percent of teenagers in communities having fluoridated water are free of dental decay as compared to only 5 percent in nonfluoridated communities. The incidence of root caries in older patients is also only half of that in nonfluoridated water supplies. Consumption of drinking water containing two ppm or more of fluoride by children can cause enamel defects and staining of teeth called fluorosis. It is an intrinsic stain and can be an unsightly esthetic problem to the patient. (Water sources other than a community supply should be checked for fluoride content before a fluoride supplement is prescribed.) Fluoridated water has been endorsed by the Department of the Army for adoption on Army installations where there is a substantial child population in residence, where natural fluoride levels are ineffectively low, and where the levels can be adequately controlled. Most Army installations in the US and many in overseas areas use fluoridated water supplies.

3-17. SUPPLEMENTAL SYSTEMIC FLUORIDATION

a. **General.** Caries reduction rates can be obtained by administering fluoride drops or tablets to children. Dosage, as prescribed by a dentist or physician, is based on the age of the child and the level of fluoride in their drinking water.

b. **Three Years or Older.** A typical prescription for a child 3 years or older is as follows.

   Rx  Sodium fluoride tablets 2.2 mg.
   Dispense 120 tablets.
   Sig. One tablet each day, to be chewed and swished before swallowing.

   **CAUTION:** Store out of reach of children

c. **Two to Three Years of Age.** For the child between two and three years of age, the directions for the label can be changed to specify either one half of a 2.2 mg tablet each day or a tablet containing 1.1 mg of sodium fluoride every day.
d. **Infants.** One 2.2 mg tablet of sodium fluoride completely dissolved in 1 quart of water will provide infants with fluoridated water containing approximately 1 ppm.

e. **Dietary Supplements.** Vitamins and sodium fluoride have been combined in a number of products marketed as dietary supplements for infants and children. These products are prescribed rather frequently by pediatricians. There is little question of the effectiveness of the fluoride in vitamins in reducing the incidence of dental caries when used daily. However, there is no evidence that the inclusion of the vitamins enhances the effectiveness of the fluoride. The fixed proportion of ingredients in the combination also makes it more difficult to adjust appropriately the amount of fluoride prescribed in areas where the drinking water contains substantial but inadequate levels of fluoride. For these reasons, the Council on Dental Therapeutics has accepted brands of sodium fluoride as dietary supplements, but has not accepted combinations with vitamins.

f. **Prenatal Use.** Prenatal fluoride administration has not consistently demonstrated beneficial results. The U.S. Food and Drug Administration banned the marketing of fluoride-containing products that made claims of preventing decay in children whose mother ingested fluoride during pregnancy.

3-18. **TOPICAL APPLICATION**

a. **General.** Fluoride may also be applied directly to the surface of the teeth. The effectiveness of topically applied fluoride varies with the concentration of the solution used and the method and frequency of application. A number of fluoride preparations are available for topical use. These consist of sodium fluoride, acidulated phosphate-fluoride, and stannous fluoride.

b. **Mouth Rinses.** Daily mouth rinsing with a solution of 0.05 percent sodium fluoride or weekly rinsing with 0.2 percent sodium fluoride has been shown to reduce the incidence of dental caries by about 30 percent in both fluoridated and nonfluoridated communities.

c. **Dentifrices.** Currently both sodium fluoride and sodium monofluorophosphate are being used as fluoride additives to toothpastes. Stannous fluoride was used until 1981, but was discontinued. Daily use of any of the American Dental Association approved toothpastes containing fluoride reduces caries by 20 to 40 percent.
d. **Topical Solutions.**

(1) **Sodium fluoride.** As a topical solution, sodium fluoride has been shown to reduce the incidence of caries by at least 20 percent in nonfluoridated communities. Its effectiveness in fluoridated communities has not been established. A 2 percent solution is recommended to be applied in a series of four treatments given several days apart and following a single prophylaxis at age 3 to afford protection to the deciduous teeth and as groups of permanent teeth erupt at ages 7, 11, and 13. Adjustment to that schedule should be made according to each child's pattern of tooth eruption. Following a thorough prophylaxis, the teeth are isolated with cotton rolls, dried thoroughly, and wet completely with a 2 percent aqueous sodium fluoride solution. The solution is left in place for 3 to 5 minutes, taking precautions to prevent saliva contamination. A prophylaxis prior to the remaining topical treatments is usually not necessary if they are done within a few days.

(2) **Acidulated phosphate fluoride.** The topical application of sodium fluoride solutions and gels acidified with orthophosphoric acid has been demonstrated by clinical studies to have significant caries-inhibiting effect in children. The preparation most often employed contains a fluoride concentration of 1.23 percent in approximately 1 percent orthophosphoric acid. Annual topical applications of acidulated phosphate-fluoride gels in trays have produced reductions in dental caries of 37 to 41 percent. Daily tray applications of a 0.5 percent gel each school day produced a reduction of approximately 80 percent in a nonfluoridated area. Both neutral and acidulated phosphate fluoride gels have been used successfully to control the rampant decay seen in cases of xerostomia (dry mouth) produced by cancer radiation therapy. In the tray procedure, a ribbon of gel is placed in the tray, the teeth are dried, the tray is seated over the teeth and squeezed slightly to expel the gel, and then allowed to remain in place for four minutes. The patient is instructed not to eat or rinse his mouth for the next 30 minutes.

**CAUTION:** When using prophylaxis paste, the PDS must cover porcelain-veneered crowns with petroleum jelly.

(3) **Stannous fluoride.** A single application of a freshly prepared 8 percent aqueous solution of stannous fluoride at 6- to 12-month intervals is the generally preferred method of use. This method with stannous fluoride requires less time than the series of four applications of sodium fluoride and appears to produce similar caries-reducing results. The stannous fluoride solution is applied in basically the same manner as the other fluoride solutions. Staining has been noted in some clinical studies using stannous fluoride. Some studies indicate the dark stain to be related to debris and plaque material rather than tooth structure. Further studies are needed to completely evaluate this problem.
e. Prophylaxis Pastes With Fluoride. A thorough prophylaxis removes a very thin layer of enamel from the teeth. This layer is generally very rich in fluoride and otherwise more highly mineralized than the deeper layers. Some researchers suggest that if a prophylaxis is not to be followed by a topical application of a concentrated fluoride solution or gel, a fluoride-containing prophylaxis paste should be used in an effort to replenish lost fluoride. However, other researchers feel that fluoride prophylaxis pastes are ineffective when used without a topical solution.

3-19. PRECAUTIONS

Fluoride solutions are toxic to the human body if ingested in large quantities. They cause nausea if swallowed in small amounts, particularly in small children. Close supervision and care must be taken when using these solutions clinically or when prescribing them for home use. Many commercial preparations of fluoride mouthwashes are now available over the counter at most drug stores. Patients should be cautioned to follow the manufacturer's directions exactly.

3-20. OCCLUSAL SEALANTS

Although fluoride will drastically reduce the overall prevalence of dental caries, it is least effective on occlusal decay. This is the area in which the occlusal sealants are a valuable adjunct. With this method, the outermost layer of enamel is made receptive to bonding by acid decalcification. The orifices of the pits and fissures are physically occluded with a resin material rendering them immune to caries as long as the resin is retained. Retention seems to be greater for premolars than molars and for mandibular rather than maxillary teeth. It would seem that the concern about possible progression of carious lesions isolated underneath sealant materials is unfounded. As long as the sealant is intact, there is a progressive decrease in the number of viable bacteria under the restoration and thus the carious lesion may become inactive. Occlusal sealant application should be part of the preventive dentistry program.
3-21. POLISHING WITH PROPHYLAXIS PASTE

a. **General.** Commercially available prophylaxis preparations come in a variety of forms--pastes, powders, or tablets. For those preparations requiring mixing before use, refer to the manufacturer's instructions.

b. **Use.** The paste cleans best when it is thick, resembling window putty. If the mixture is too dry, water may be added one drop at a time. Avoid adding too much water. A thin mixture will not clean properly. If the mixture is too thin, small particles of zirconium silicate may work into the handpiece and cause premature wear. When zirconium silicate is used, the handpiece should be cleaned after each use to minimize damage. Rubber cups are used on facial and lingual surfaces. Unwaxed dental floss or tape is used on proximal surfaces. Stiff-bristled prophylaxis brushes are used on occlusal surfaces and in pits and fissures. Each surface is polished a full 10 seconds. The major protective effect of these compounds is the prevention or arrest of proximal caries.

c. **Precautions.** When polishing with prophylaxis paste, certain precautions are necessary.

   (1) **Concern about swallowing.** Care should be taken to prevent swallowing or trickling of prophylaxis paste into the patient's pharynx. This causes gagging or nausea.

   (2) **Inflammation after scaling.** If acute inflammation is present after scaling, polishing should be delayed until the inflammation resolves.

   (3) **Injury of soft tissues.** Care should be used to avoid injuring soft tissues during polishing.

   (4) **Frequent rinsing.** During prophylaxis, frequent and thorough rinsing should be carried out to prevent prolonged contact of paste with gingival tissues. Prolonged contact can cause blanching of the tissues.
EXERCISES, LESSON 3

INSTRUCTIONS. Answer the following exercises by marking the lettered response that best answers the question or best completes the incomplete statement or by writing the answer in the space provided.

After you have completed all the exercises, turn to "Solutions to Exercises" at the end of the lesson and check your answers.

1. As used in dentistry, oral prophylaxis refers to:
   a. Safety precautions used by the PDS.
   b. Antiseptic mouth rinsing.
   c. All procedures done in the mouth.
   d. Scaling and polishing procedures.
   e. Ability to recognize oral disease.

2. A good oral prophylaxis is one in which there is the least:
   a. Trauma to tissues and restorations.
   b. Scaling and polishing.
   c. Fluoride solution applied to the teeth.
   d. Discomfort to the patient.
   e. Items "a" and "d" above.
3. In the illustration of instruments and materials for oral prophylaxis below, identify the following items.

a. # 3 ____________________________

b. # 4 ____________________________

c. # 8 ____________________________

d. # 9 ____________________________

e. # 10 ____________________________
4. Match the detection instrument in Column II to the description in Column I.

<table>
<thead>
<tr>
<th>COLUMN I</th>
<th>COLUMN II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) ____ Detects calculus, caries, and examines contours of teeth and restorations.</td>
<td>a. Mirror.</td>
</tr>
<tr>
<td>(2) ____ Allows for a more proficient examination of oral tissue and supragingival deposits.</td>
<td>b. Periodontal probe.</td>
</tr>
<tr>
<td>(3) ____ Measures sulcus and pocket depths.</td>
<td>c. Explorers.</td>
</tr>
</tbody>
</table>

5. Match the scaling instrument in Column II to the description in Column I.

<table>
<thead>
<tr>
<th>COLUMN I</th>
<th>COLUMN II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) ____ Used in all areas of the mouth.</td>
<td>a. Gracey curettes.</td>
</tr>
<tr>
<td>(2) ____ Used to remove subgingival calculus.</td>
<td>b. Sickle scalers.</td>
</tr>
<tr>
<td>(3) ____ Used to remove supragingival calculus.</td>
<td>c. Universal curettes.</td>
</tr>
</tbody>
</table>

6. Which of the following instruments is used primarily for the mesial surfaces of posterior teeth?

   b. Gracey 11-12.
   d. McCall's 13S-14S.
   e. Jacquette 21S-33.
7. Which of the following scaling instruments is more likely to produce undue trauma?
   a. Sickle Scaler U 15-33.
   b. Younger-Good 7-8.
   d. Gracey 1-2.

8. Which of the following items of equipment uses an activated insert tip together with the bubbling action of water to dislodge calculus and stain?
   a. Prophy jet.
   b. Dental unit sonic scaler.
   c. Ultrasonic dental unit.

9. To avoid damage to tooth structure, does the insert tip of the ultrasonic dental unit have to be kept moving constantly?
   a. Yes.
   b. No.

10. Which of the following items of equipment is handled like a slow-speed handpiece?
    a. Ultrasonic dental unit.
    b. Air polishing prophylaxis unit.
    c. Dental unit sonic scaler.
11. Which of the following must not be used on patients with cardiac pacemakers?
   a. Ultrasonic dental unit.
   b. Prophy jet.
   c. Dental unit sonic scaler.

12. Which of the following items of equipment should be used only by a PDS who is specifically trained in its usage?
   a. Ultrasonic dental unit.
   b. Prophy jet.
   c. Dental unit sonic scaler.

13. List three methods of grasping a scaling instrument.
   a. _____________________________________
   b. _____________________________________
   c. _____________________________________

14. Which method of grasping a scaling instrument is used with the Porte Polisher, and also the air, water syringe?
   a. Pen grasp.
   b. Modified pen grasp.
   c. Palm grasp.
15. Complete statements related to the use of scaling instruments.

a. From the base of the calculus deposit, the scaling instrument is pulled toward the ____________ or ________________ surface.

b. In working on lingual and proximal surfaces, a PDS must depend upon ____________ ____________ to determine the presence and extent of calculus.

16. Complete statements related to establishing a finger rest and the steps in the scaling process.

a. Establish a finger rest on the same ______________ being worked on, preferably on an ______________ tooth.

b. Place the tip of the instrument beneath the ____________ to be scaled, with the tip in contact with the tooth ______________ at all times.

c. Activate the instrument using ____________ ____________ activation.

   Move the instrument in a ____________ direction, always leading with the tip.

17. In the blank spaces provided, list the scaling and polishing sequence recommended in the text. Use numbers 1 through 6 to indicate the proper sequence.

_____ a. Mandibular right posterior.

_____ b. Maxillary anterior.

_____ c. Mandibular left posterior.

_____ d. Maxillary left posterior.

_____ e. Mandibular anterior.

_____ f. Maxillary right posterior.
18. Which tooth surfaces are generally scaled and polished first?
   
   a. Lingual surfaces.
   
   b. Facial and proximal surfaces.

19. Match the suggested finger rest in Column II to the area in the mouth in Column I. Items in Column II can be used more than once.

<table>
<thead>
<tr>
<th>COLUMN I</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(1) Maxillary right posterior, facial and proximal surfaces.</td>
<td>a. Occlusal surfaces.</td>
</tr>
<tr>
<td>(2) Maxillary right posterior, lingual surfaces.</td>
<td>b. Facial or occlusal surfaces</td>
</tr>
<tr>
<td>(3) Maxillary anterior.</td>
<td>c. Linguoincisal edges of adjacent teeth.</td>
</tr>
<tr>
<td>(5) Mandibular anterior, left sides</td>
<td>e. Lingual surfaces.</td>
</tr>
<tr>
<td>(6) Mandibular anterior, right sides.</td>
<td></td>
</tr>
<tr>
<td>(7) Mandibular right posterior.</td>
<td></td>
</tr>
</tbody>
</table>
20. Match the suggested PDS position (for a right-handed person) in Column II to the area in the mouth in Column I. Items in Column II may be used more than once. Items in Column I may have more than one correct answer.

<table>
<thead>
<tr>
<th>COLUMN I</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(1) ___ Maxillary right posterior, facial, and proximal surfaces.</td>
<td>a. 12 o'clock position.</td>
</tr>
<tr>
<td>(2) ___ Maxillary right posterior, lingual surfaces.</td>
<td>b. 9 o'clock position.</td>
</tr>
<tr>
<td>(3) ___ Maxillary anterior</td>
<td>c. 8 o'clock position.</td>
</tr>
<tr>
<td>(4) ___ Mandibular left posterior, facial and proximal surfaces.</td>
<td></td>
</tr>
<tr>
<td>(5) ___ Mandibular left posterior, lingual surfaces.</td>
<td></td>
</tr>
<tr>
<td>(6) ___ Mandibular anterior, left sides.</td>
<td></td>
</tr>
<tr>
<td>(7) ___ Mandibular anterior, right sides.</td>
<td></td>
</tr>
<tr>
<td>(8) ___ Mandibular right posterior, facial, and proximal surfaces.</td>
<td></td>
</tr>
<tr>
<td>(9) ___ Mandibular right posterior, lingual surfaces.</td>
<td></td>
</tr>
</tbody>
</table>

21. When scaling the lingual surfaces of teeth, a mouth mirror is usually needed for light and vision. However, for the __________ teeth, a mouth mirror is needed for tongue retraction.

a. Mandibular anterior.

b. Maxillary right posterior.

c. Mandibular right posterior.

d. Maxillary left posterior.

e. Mandibular left posterior.
22. The suggested finger rest is on the occlusal surfaces for the:
   a. Mandibular anterior, right lingual surfaces.
   b. Maxillary anterior, lingual surfaces.
   c. Mandibular left posterior, lingual surfaces.
   d. Maxillary right posterior, facial, and proximal surfaces.
   e. Mandibular anterior, lingual surfaces.

23. The suggested finger rest is on the lingual surfaces for the:
   a. Mandibular anterior, sides toward (right sides).
   b. Maxillary left posterior, facial, and proximal surfaces.
   c. Mandibular right posterior, facial, and proximal surfaces.
   d. Mandibular left posterior.
   e. Mandibular anterior, sides away (left sides).

24. The suggested PDS position is at 12 o’clock to scale the (choose more than one response):
   a. Maxillary right posterior, facial, and proximal surfaces.
   b. Mandibular anterior, facial, and proximal surfaces, sides away (right sides).
   c. Maxillary left posterior, facial, and proximal surfaces.
   d. Mandibular anterior, lingual surfaces, sides away (left sides).
   e. Mandibular right posterior, facial, and proximal surfaces.
25. The suggested PDS position is at 9 o'clock to scale the (choose more than one response):
   a. Mandibular right posterior, facial, and proximal surfaces.
   b. Maxillary right posterior, facial, and proximal surfaces.
   c. Mandibular left posterior, lingual surfaces.
   d. Maxillary anterior, facial, and proximal surfaces.
   e. Mandibular anterior, lingual surfaces, sides toward.

26. The suggested PDS position is at 8 o'clock to scale the (choose more than one response):
   a. Maxillary left posterior, lingual surfaces.
   b. Mandibular anterior, facial surfaces, sides toward.
   c. Mandibular left posterior, facial and proximal surfaces.
   d. Mandibular anterior, lingual surfaces, sides toward.
   e. Mandibular right posterior, facial and proximal surfaces.

27. Complete information related to polishing teeth.
   a. An abrasive powder called ___________ ___________ is used to polish teeth.
   b. The polishing agent is applied to the teeth with a small ___________ ___________,
      using the ________________ handpiece.
   c. Unwaxed ___________ or ________________ is used as the carrier to polish proximal surfaces.
28. The optimum level of fluoride concentration in water is:
   a. 0.7 to 1.2 ppm.
   b. 1.2 to 2.0 ppm.

29. Fifty percent of teenagers are free of dental decay where there is fluoridated water. What is the percentage for nonfluoridated communities?
   a. 20 percent.
   b. 10 percent.
   c. 5 percent.

30. Less fluoride is needed in a community water system in:
   a. Cooler climates.
   b. Warmer climates.

31. The typical prescription of sodium fluoride tablets for a child 3 years of age or older is:
   a. One 2.2 mg tablet dissolved in 1 quart of water.
   b. One-half of a 2.2 mg tablet each day.
   c. A mixture of vitamins and sodium fluoride.
   d. One chewable 2.2 mg tablet each day.

32. Daily use of toothpaste with fluoride additives reduces caries by:
   a. 20 percent.
   b. 30 percent.
   c. 20 to 40 percent.
33. Match the topical fluoride solution in Column II to the treatment description in Column I.

<table>
<thead>
<tr>
<th>COLUMN I</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(1) ___ Four treatments, several days apart, as groups of permanent teeth erupt.</td>
<td>a. Stannous fluoride.</td>
</tr>
<tr>
<td>(2) ___ Annual topical application of gels in trays or daily tray application.</td>
<td>b. Sodium fluoride.</td>
</tr>
<tr>
<td>(3) ___ A single application at 6 to 12 month intervals.</td>
<td>c. Acidulated phosphate flouride.</td>
</tr>
</tbody>
</table>

34. The topically applied fluoride solution that takes less time to use is:
   a. Sodium fluoride.
   b. Acidulated phosphate fluoride.
   c. Stannous fluoride.

35. Select the topical fluoride solution with an 8 percent aqueous solution.
   a. Acidulated phosphate fluoride.
   b. Stannous fluoride.
   c. Sodium fluoride.

36. Complete information related to occlusal sealant application.
   a. Fluoride is least effective on _______________ decay.
   b. The orifices of the _______________ and _______________ are physically occluded with a _______________ material.
   c. This sealant renders them _______________ to caries as long as the resin is retained.
37. Prophylaxis paste cleans and polishes best when it is:
   a. Dry.
   b. Thin.
   c. Thick.

38. When zirconium silicate is used for tooth polishing, the handpiece should be cleaned:
   a. After each use.
   b. At the end of each day.
   c. At regular intervals.

39. Each tooth surface is polished a full:
   a. 5 seconds.
   b. 10 seconds.
   c. 15 seconds.
   d. 20 seconds.

40. Complete information related to the polishing of teeth.
   a. When polishing facial and lingual surfaces of teeth, ______________
      __________are used.
   b. When polishing proximal surfaces, ____________ dental floss or tape is used.
   c. When polishing occlusal surfaces, __________________________prophylaxis
      brushes are used.
41. Complete information related to precautions to be followed when using prophylaxis paste.
   a. Care should be taken to prevent swallowing or trickling of prophylaxis paste into the pharynx. This causes ______________ or ______________.
   b. Care should be used to avoid injuring ______________ during polishing.
   c. Frequent and thorough ______________ should be carried out to prevent prolonged contact with gingival tissues.

Check Your Answers on Next Page
SOLUTIONS TO EXERCISES, LESSON 3

1. d (para 3-1)

2. e (para 3-1)

3. a. Face mask.  
   b. Gloves.  
   c. Protective glasses.  
   d. Prophy angle handpiece.  
   e. Fluoride trays. (figure 3-1)

4. (1) c  
(2) a  
(3) b (para 3-4)

5. (1) c  
(2) a  
(3) b (para 3-5)

6. b (para 3-5c(3))

7. a (para 3-5a(1))

8. c (para 3-6a)

9. a (para 3-6b)

10. c (para 3-7a)

11. a (para 3-6c(4))

12. b (para 3-7b)

13. Pen grasp.  
    Modified pen grasp.  
    Palm grasp. (para 3-8b)

14. c (para 3-8b(2))

15. a. occlusal; incisal (para 3-8c)  
   b. tactile sense (para 3-8d)
16. a. arch; adjacent (para 3-9b,c)  
   b. deposit; surface (para 3-9d(4))  
   c. rotary motion; coronal (para 3-9d(6))

17. a. 6 
   b. 2 
   c. 4 
   d. 3 
   e. 5 
   f. 1 (para 3-10)

18. b (para 3-10)

19. (1) e 
   (2) a 
   (3) c 
   (4) a 
   (5) d 
   (6) e 
   (7) a (para 3-13; Appendix D)

20. (1) b 
   (2) b 
   (3) a or c 
   (4) b 
   (5) b 
   (6) a 
   (7) c 
   (8) b 
   (9) b (para 3-13; Appendix D)

21. e (para 3-13d; Appendix D)

22. c (para 3-13d; Appendix D)

23. a (para 3-13e; Appendix D)

24. b, d (para 3-13e; Appendix D)

25. a, b, c (para 3-13a, d, f; Appendix D)

26. b, d (para 3-13e; Appendix D)

27. a. zirconium silicate 
   b. rubber cup; contra-angle 
   c. floss; tape (para 3-14)
28. a (para 3-16)
29. c (para 3-16)
30. b (para 3-16)
31. d (para 3-17b)
32. c (para 3-18c)
33. (1) b
   (2) c
   (3) a (para 3-18d)
34. c (para 3-18d(3))
35. b (para 3-18d(3))
36. a. occlusal
   b. pits; fissures; resin
   c. immune (para 3-20)
37. c (para 3-21b)
38. a (para 3-21b)
39. b (para 3-21b)
40. a. rubber cups
   b. unwaxed
   c. stiff-bristled (para 3-21b)
41. a. gagging; nausea
   b. soft tissues
   c. rinsing (para 3-21c)