

Chapter 19

DENTAL TREATMENT OF RECRUITS

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INTRODUCTION

Dental treatment of recruits is based more on policy than indications. As a result, the dental treatment that recruits receive varies according to the priorities of the military service providing treatment. This chapter examines (a) the system of classifying the oral health

needs of recruits and active duty service members, (b) the distribution of oral disease among recruits, (c) service-specific differences in the dental treatment of recruits, and (d) health promotion and injury prevention initiatives that the services provide.

DEPARTMENT OF DEFENSE DENTAL FITNESS CLASSIFICATION

The Army Oral Health Maintenance and Fitness Programs

In response to the large numbers of dental emergencies during the Vietnam War, US Army leaders initiated phase 1 of the Army Oral Health Maintenance Program (AOHMP) in 1968. The AOHMP mandated that every service member under 25 years of age report annually for a dental examination during his or her month of birth and be offered appointments to eliminate adverse dental conditions. The purpose of this program was to promote prevention of dental disease and provide dental care so that service members were dentally fit. The first AOHMP was targeted only to those individuals 25 years of age and younger.

However, Army leaders soon realized that all recruits were at risk for dental disease, and phase 2 of the AOHMP began in 1971 when the program was expanded to include all active duty personnel. The impetus behind phase 2 was largely prevention of periodontal disease, in accordance with the belief at that time that caries was a disease of the young and that periodontal disease affected older individuals. The two phases were integrated in 1974; all active duty personnel were then required to have annual dental examinations. Parker and Mayotte¹ studied the effectiveness of the AOHMP in 1979 and found that only 50% of their sample population received their yearly dental examinations. Thus, the attempt to ensure that soldiers received regular examinations to identify and correct their oral conditions was only partially successful.

Demand by line officers to further decrease dental emergencies resulted in creation of the Oral Health Fitness Program, which replaced the AOHMP in March 1987. The Oral Health Fitness Program originated the term “dental readiness.” More importantly, the program required that each service member receive an annual dental examination and a dental fitness classification (DFC).²

The Dental Fitness Classification System

The DFC includes the following classifications:

- **Class 1**—includes service members who require no dental treatment (on examination, no further dental appointments are given or recommended).
- **Class 2**—includes service members whose existing dental condition is unlikely to result in a dental emergency within a 12-month period.
- **Class 3**—includes service members who require dental treatment to correct a dental condition that is likely to cause a dental emergency within a 12-month period.
- **Class 4**—includes service members whose dental condition is unknown; also includes service members who have had no examination, service members with their last examination more than 12 months old, and active duty service members who missed a second annual examination.

This DFC system provides a mechanism to identify and target service members at highest risk for treatable dental conditions (eg, periodontal disease, temporomandibular dysfunction [TMD], etc). The DFC stemmed from a study conducted on troops deployed to the Sinai Peninsula.³ Troops received intensive treatment before the Sinai deployment, but only emergency care was provided during the deployment. The study used A, B, and C classifications that closely resembled dental fitness classes 1, 2, and 3. The study found that service members classified as DFC 1 experienced dental emergencies at a rate of 67 per 1,000 soldiers per year; for service members classified as DFC 2, the rate was 145/1,000/year; and for service members classified as DFC 3, the rate was 530/1,000/year. The study resulted in a new dental classification system that was incorporated into Army Regulation 40-35, *Preventive Dentistry*, released on March 26, 1989.

Standardization of Dental Classification

The first attempt to standardize dental classifications among the four service branches occurred in 1990, when Department of Defense (DoD) Instruction 6410.1,

EXHIBIT 19-1**TEMPOROMANDIBULAR DYSFUNCTION**

Although the overall incidence of the condition is low, temporomandibular dysfunction (TMD) affects both men and women. According to a 1994 Tri-Service Recruit Comprehensive Oral Health survey,¹ approximately 3.5% of female recruits were found to have some type of orofacial pain or limited mandibular movement sufficient enough to require referral and/or treatment for TMD. The incidence for women was significantly higher than that for males (1.5%). Civilian studies^{2,3} have shown consistently an increased incidence of TMD (1.5- to 2-fold higher) in women compared with men, and most patients treated for TMD (80%) are women. Age plays a strong role in women. Symptoms begin after puberty and peak during the reproductive years, with prevalence highest among women aged 20 to 40. Gender and age distributions of TMD expression strongly suggest a link to the female hormonal system. Some studies³⁻⁵ have shown that women who use oral contraceptives may be at increased risk, compared with women who do not. TMD pain levels increase during menstruation.^(6,7) Current studies investigating the relationship of increased risk with the presence of estrogen receptors in the temporomandibular joint structures (particularly the synovial lining cells, the articular disc, and the chondrocytes) have produced contradictory results.^{8,9}

Known causes of TMD symptoms include injury to the temporomandibular joint from blunt force to the face, arthritis, joint overload, or repetitive loading (usually because of bruxism or grinding of the teeth). Stress can produce TMD symptoms when it causes patients to clench or brux their teeth more frequently, either at night or during the day. Masticatory muscle spasms and pain may result. Attempts should be made to relax the muscles as much as possible. Once acute symptoms are under control, examination of the occlusion and oral habits will reveal if the patient might benefit from wearing an appliance (eg, a bite plate) every night to prevent or minimize the effects of jaw movements during sleep. If symptoms recur, the patient should initiate moist heat application, stretching therapy, and use of nonsteroidal antiinflammatory drugs. Normally, this treatment will prevent the development of more severe problems.

Ideally, the TMD patient should see a dentist for a comprehensive evaluation of contributing factors from diet, occlusion, oral habits, and stress. Initial evaluation for acute TMD pain from trauma must rule out fractures, tears, and articular disc displacement. Conservative therapy for an acute condition should reduce joint loading and inflammation. The patient should use ice or cold packs for the first 24 to 48 hours, adhere to a soft diet, and avoid gum chewing. The use of nonsteroidal antiinflammatory drugs should be initiated as soon as possible. Acute closed lock (an internal joint derangement that prevents opening the mouth) warrants an immediate referral for evaluation by an oral and maxillofacial surgeon or by an orofacial pain specialist, because early intervention beyond conservative therapy (such as arthrocentesis) may be necessary.

After the first 24 to 48 hours, the patient should apply moist heat several times per day. Gentle stretching exercises of the mastication muscles should be performed after heat application. The patient should continue to avoid gum chewing and adhere to a soft diet for several days to limit masticatory activity.

Pharmacological interventions should begin with analgesics, preferably nonsteroidal antiinflammatory analgesics. Patients with more severe TMD may also require short-term use of skeletal muscle relaxants. Because low-dose tricyclics improve sleep, they may be effective in decreasing pain from nocturnal bruxism. Further evaluation should determine if the patient would also benefit from behavioral therapy (eg, relaxation techniques) to decrease muscle jaw tension, decrease stress, increase awareness, and cease diurnal tooth grinding or clenching incidents.

Data sources: (1) Tri-Service Comprehensive Oral Health Survey Working Group. 1994 *Tri-Service Comprehensive Oral Health Survey—Active-Duty Report*. Washington, DC: Department of Defense, Office of the Assistant Secretary of Defense for Health Affairs; June 1995. Naval Dental Research Institute-PR 9503. (2) Dworkin SF, Huggins KH, LeResche L, et al. Epidemiology of signs and symptoms in temporomandibular disorders: Clinical signs in cases and controls. *J Am Dent Assoc*. 1990;120:273–281. (3) Warren MP, Fried JL. Temporomandibular disorders and hormones in women. *Cells Tissues Organs*. 2001;169:187–192. (4) Bragdon EE, Light KC, Costello NL, et al. Group differences in pain modulation: Pain-free women compared to pain-free men and women with TMD. *Pain*. 2002;96:227–237. (5) Nekora-Azak A. Temporomandibular disorders in relation to female reproductive hormones: A literature review. *J Prosthet Dent*. 2004;91:491–493. (6) LeResche L, Mancl L, Sherman JJ, Gandara B, Dworkin SF. Changes in temporomandibular pain and other symptoms across the menstrual cycle. *Pain*. 2003;106:253–261. (7) Isslee H, De Laat A, De Mot B, Lysens R. Pressure-pain threshold variation in temporomandibular disorder myalgia over the course of the menstrual cycle. *J Orofac Pain*. 2002;16:105–117. (8) Campbell JH, Courey MS, Bourne P, Odziemiec C. Estrogen receptor analysis of human temporomandibular disc. *J Oral Maxillofac Surg*. 1993;51:1101–1105. (9) Abubaker AO, Raslan WF, Sotereanos GC. Estrogen and progesterone receptors in temporomandibular joint discs of symptomatic and asymptomatic persons: A preliminary study. *J Oral Maxillofac Surg*. 1993;51:1096–1100.

TABLE 19-1
DENTAL FITNESS CLASSIFICATION SYSTEM

Dental Class	Deployable Description	Dental Status
Class 1	Patients with a current dental examination who do not require dental treatment or reevaluation	Worldwide deployable
Class 2	Patients with a current dental examination who require nonurgent dental treatment or reevaluation for oral conditions that are unlikely to result in dental emergencies within 12 months; patients may exhibit the following: • treatment or follow-up indicated for dental caries or minor defective restorations that can be maintained by the patient • interim restorations or prostheses that can be maintained by the patient for 12 months • edentulous areas requiring prostheses, but not immediately • periodontium that requires: — oral prophylaxis — maintenance therapy — treatment for slight-to-moderate periodontitis and stable cases of more advanced periodontitis — removal of supragingival or mild-to-moderate subgingival calculus • unerupted, partially erupted, or malposed teeth that are without historical, clinical, or radiographic signs or symptoms of pathosis, but are recommended for prophylactic removal • active orthodontic treatment • temporomandibular dysfunction patients in maintenance therapy	Worldwide deployable
Class 3	Patients who require urgent or emergent dental treatment: • treatment or follow-up indicated for dental caries, symptomatic tooth fracture, or defective restorations that cannot be maintained by the patient • interim restorations or prostheses that cannot be maintained for 12 months • patients requiring treatment for the following periodontal conditions that may result in dental emergencies within the next 12 months: — active gingivitis or pericoronitis — active, progressive, moderate, or advanced periodontitis — periodontal abscess — progressive mucogingival condition — periodontal manifestations of systemic disease or hormonal disturbances — heavy subgingival calculus • edentulous areas, or teeth requiring immediate prosthodontic treatment for adequate mastication, communication, or acceptable aesthetics • unerupted, partially erupted, or malposed teeth with historical, clinical, or radiographic signs or symptoms of pathosis that are recommended for removal • chronic oral infections or other pathologic lesions, including: — pulpal, periapical, or resorptive pathology requiring treatment — lesions requiring biopsy or awaiting biopsy report • emergency situations requiring therapy to relieve pain, treat trauma, treat acute oral infections, or provide timely follow-up care (eg, drain or suture removal) until resolved • acute temporomandibular dysfunction requiring active treatment that may interfere with duties	Usually not considered world-wide deployable
Class 4	Patients who require periodic dental examinations or patients with unknown dental classifications	Usually not considered world-wide deployable

Reproduced from: Department of Defense (Health Affairs). *Policy on Standardization of Oral Health and Readiness Classifications*. Washington, DC: Department of Defense; 2002. DoD / HA Policy Letter 02-011.

Standardization of Dental Classifications, was released.⁴ This document clearly identified the oral conditions associated with the DFC categories in which soldiers were placed. One serious condition mentioned in several of the classes is TMD. Exhibit 19-1 describes the condition and its treatment.

In March 1996, the Assistant Secretary of Defense directed the dental service chiefs to develop a dental classification system that would be consistent for all branches of military service. DoD Health Affairs Policy 97-020, *Policy for Standardization of Dental Classification*, released on December 19, 1996, noted that good oral health is essential to the readiness posture of US forces and that the classification criteria for dental readiness should be used by all services.⁵ There were minor changes made to DoD Instruction 6410.1, and for the first time the services used one common classification system. In conjunction with standardizing dental classification criteria, the DoD health affairs policy set a 95% dental readiness goal for all military services,⁶ wherein 95% of the total active duty population should be classified as either DFC 1 or DFC 2. Accordingly, only 5% of service members should be in the nondeployable categories of DFC 3 or DFC 4.

The current directive was released on June 4, 2002. It emphasized the importance of the DFC system in the overall oral health of all uniformed DoD personnel.⁷ The directive also stated that standardization of oral health measurements is integral to the health protection of service members.

The DoD health affairs policy required that all active duty service members have a yearly dental examination, followed by a DFC rating. The criteria regulating which DFC the service member receives were standardized across the services through further policy (Table 19-1). Service members in DFC 4 are urged through command emphasis to report to the dental clinic to receive an annual examination. Each service branch uses different mechanisms to alert units of their respective dental classifications. In partnership with the local line commanders, local dental commanders are the caretakers of unit dental readiness. Dental commanders educate unit commanders on the value of dental readiness. In practical terms, the dental classification system prioritizes treatment. For example, service members who are classified as DFC 3 are considered not dentally ready and are given appointments as soon as possible to rectify their dental conditions.

ORAL HEALTH OF RECRUITS

Caries and Periodontal Disease

Dental caries is demineralization of the tooth surface from bacteria. It is the most common adolescent disease among 15- to 17-year-old individuals. With many recruits just past the age of 17, it is important to note that 78% of these 17-year-olds have at least one active cavity or filling. Therefore, many recruits are entering the military service with dental problems. Caries is more than 5-fold more common than the reported history of asthma and 7-fold more common than hay fever. Despite progress in reducing dental caries, those individuals and families living below the poverty level experience more tooth decay than those people who are economically stable.^{8,9}

In addition, the proportion of teeth affected by dental caries varies by ethnicity. Regardless of their economic status, adult non-Hispanic African Americans and Mexican Americans have higher proportions of untreated decayed teeth than their non-Hispanic white American counterparts. These oral health disparities in society are subsequently reflected in the recruits entering military service.

In the year 2000, only 1.8% of incoming DoD recruits were disease free (DFC 1), 50.7% had routine dental needs (DFC 2), and 47.5% had significant dental disease

that made them nondeployable (DFC 3), according to the DoD standard. In 68% of the recruits, at least one tooth needed extraction. Furthermore, each recruit needed, on average, 2.81 fillings.¹⁰

The risk of periodontal disease has been studied for both men and women (Figure 19-1), and several risk factors have been identified (Figure 19-2),¹¹⁻¹⁴ such as smoking, a genetic tendency to produce increased levels of interleukin-1, and diabetes mellitus. Women's risk of developing gingival inflammation or periodontal problems may be increased by increased levels of estrogen and progesterone associated with the menstrual cycle or use of oral contraceptives. Gingival tissues may become tender and swollen, and may bleed during brushing. Human gingiva has specific high-affinity estrogen receptors and can function as an estrogen target tissue. The stratified squamous epithelium of the oral mucosa and gingiva responds to ovarian hormone levels, with alterations in maturation and keratinization. Estrogen is involved in the regulation and maintenance of collagen synthesis and has been associated with gingival hyperplasia.

Estrogen and progesterone also promote changes in the microcirculatory system of the gingiva. The endothelial cells and pericytes of the venules swell, granulocytes and platelets adhere to the vessel walls,

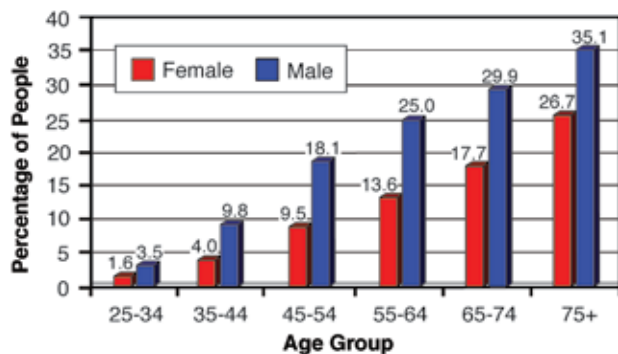


Fig. 19-1. Males are more likely than females to have at least one tooth site with 6 mm or more of periodontal loss of attachment.

Adapted from: US Department of Health and Human Services. *The Surgeon General's Report on Oral Health*. Washington, DC: USDHHS; 2000: 65.

microthrombi form, and perivascular mast cells are disrupted.¹⁵ The microvasculature proliferates and becomes more permeable, causing gingival edema and increasing the flow of gingival crevicular fluid.

The resulting fluid also contains elevated levels of sex hormones, polymorphonuclear leukocytes, and increased levels of prostaglandin E₂.

Anaerobic bacteria (eg, *Bacteroides melaninogenicus*, *Prevotella intermedia*, and *Porphyromonas gingivalis*) may be present and proliferate under these conditions. The increase in bacteria production is a result of two factors:

1. Some bacteria associated with gingival inflammation are able to metabolize steroid hormones and use them for energy production, thereby directly increasing their numbers.
2. Increased estrogen and progesterone levels also decrease neutrophil chemotaxis and phagocytosis and depress T-cell responses. This impaired immune response allows bacteria in the gingival crevice to proliferate without restraint.

Proliferating bacteria can cause increased levels of bacterial endotoxins, which can increase inflammation and trigger bone loss from the periodontium. Oral contraceptives, especially those containing progester-

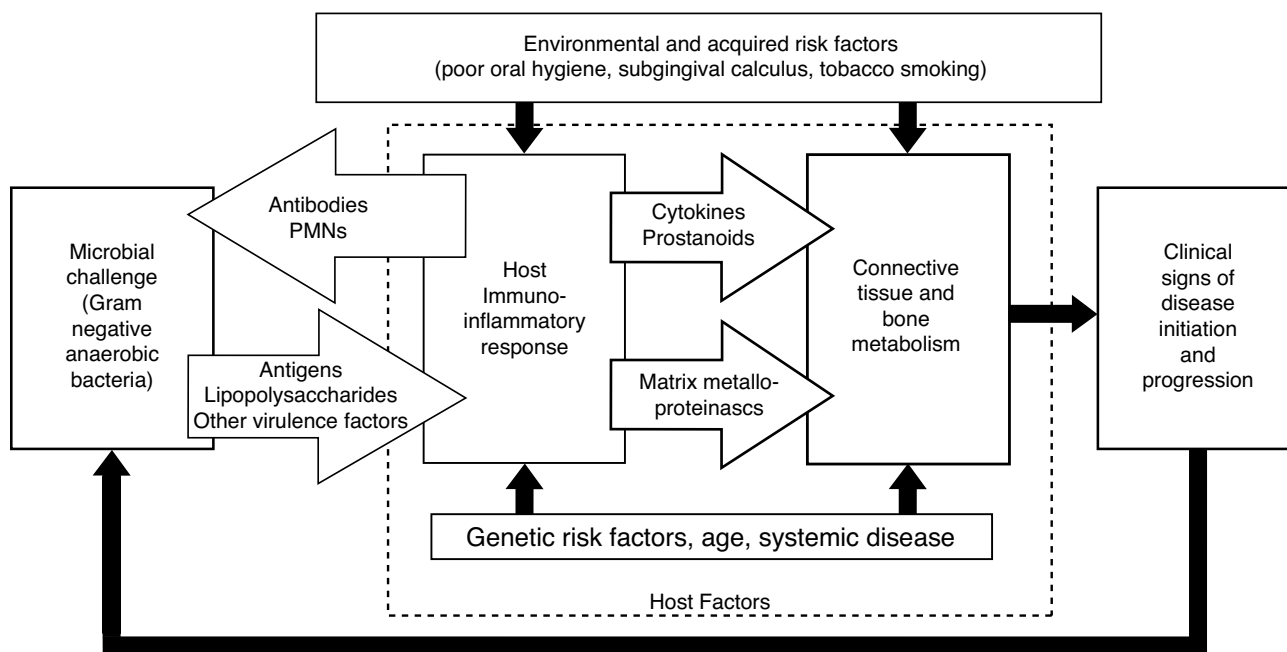


Fig. 19-2. Model of periodontitis depicting the multifactorial nature of periodontal disease. A change in any one factor can result in clinical signs of the disease.

PMN: polymorphonuclear

Data sources: Page RC, Kornman KS. The pathogenesis of human periodontitis: An introduction. *Periodontology* 2000. 1997;14:9–11. US Department of Health and Human Services. *The Surgeon General's Report on Oral Health*. Washington, DC: DHHS; 2000. Gluck G, Morganstein W. *Jong's Community Dental Health*. 5th ed. St Louis, Mo: Mosby; 2003: 185–187.

one, have been associated^{16,17} with an increased risk of periodontal bone loss. No studies have been done on Depo Provera (depomedroxyprogesterone acetate [the Upjohn Company, Kalamazoo, Mich]) and bone loss.

If left untreated, gingivitis or periodontitis that is associated with tenderness and bleeding gums may discourage the recruit from performing normal oral hygiene (see Figure 19-3). When these recruits are placed under severe stress, increased cortisol levels can compromise immune function. Under these conditions, gingivitis can progress to acute necrotizing ulcerative gingivitis, an extremely painful inflammation accompanied by necrosis of the interdental gingiva and a fetid odor.

Acute presentations of gingivitis can be managed by improved oral hygiene and the use of an antimicrobial mouthwash. Recruits with extreme gingival tenderness may be encouraged to reestablish oral hygiene procedures using viscous lidocaine hydrochloride (Xylocaine, Astra USA, Westboro, Mass) rather than an oral dentifrice. A dental professional should manage periodontal disease, because it also requires the removal of plaque-retentive factors, such as calculus or defective restorations from the crown and root surfaces of the teeth.

Neglect of oral hygiene is common in stressful training environments. Noncommissioned officers should ensure that the oral hygiene routine of all troops includes the following:

- toothbrushing, once daily at a minimum, preferably twice daily, with fluoride toothpaste to prevent dental caries and gingival problems;
- flossing daily, which is also effective in preventing gingival or periodontal problems; and

- rinsing several times a week with an antimicrobial mouthwash containing thymol or chlorhexidine gluconate (particularly in chronic periodontal conditions).

A significant amount of dental treatment is necessary for new recruits to meet the DoD standard (95% in DFC 1 or DFC 2) for dental fitness. Although the goal of all services is to meet the 95% standard, each service branch handles this differently, based on that service's unique capabilities and missions.

US Army Recruit Dental Care

On entering active duty, all recruits are classified as DFC 4 until they receive a complete oral examination. The need for dental care is very high in recruits, with 42% of them having at least one DFC 3 condition.¹⁰ The average time needed to bring a DFC 3 recruit to a deployable status is 2.75 hours.^{18,19} This is time-intensive not only for the dental treatment facilities, but also for the military personnel requiring treatment. Past attempts to provide recruit dental care failed, largely because time could not be dedicated to care for trainees. Training locations were staffed to provide complete care for permanent party personnel whereas recruits only received emergency care.

This situation changed in July 2004 when the Army Surgeon General signed a memorandum of understanding with the Commanding General of the Army Training and Doctrine Command (TRADOC). This document formalized an agreement in which the Army dental care system would provide staffing and facilities to treat recruits at basic training, advanced individual



Fig. 19-3. Two cases of gingivitis.

Photographs: Courtesy of Colonel Dave Reeves, US Army Dental Corps, Consultant to The Surgeon General in Periodontology; Chief, Periodontics, Fort Hood, Texas 76544.

training (AIT), and officer basic courses. TRADOC allows time in the training cycle for trainees to receive care. The goal is to have 95% of trainees dentally ready by the time they graduate from AIT and arrive at their first duty location. Pilot tests at two locations graduated 99.5% of their armed forces personnel in a dentally deployable status (DFC 1 or DFC 2).

US Navy and US Marine Corps Recruit Dental Care

The Navy Dental Corps is responsible for the operational dental readiness of sailors and marines. Currently, the Navy has a varying degree of dental capability on approximately 20% of its ships and limited deployed dental availability. Deployed marines use the field dental units. Because the provision of even basic urgent dental care in a Navy or Marine Corps operational environment can be extremely difficult, it is necessary to treat diagnosed urgent needs before sailors and marines leave the basic training environment. After completion of basic training and AIT, many sailors and marines are assigned to isolated operational duty stations. Thus, it is beneficial for them to be in the highest states of dental readiness before assignment to permanent duty stations.

This high level of dental readiness begins at the onset of Navy and Marine Corps basic training, in which recruits are given a comprehensive dental examination that includes the following:

- a set of bitewing radiographs;
- a panoramic radiograph;
- a complete forensic charting using oral and radiographic landmarks;
- an oral cancer examination;
- a health history review, including tobacco use history and continued abstinence encouragement; and
- a treatment plan.

Once the recruit's treatment needs are identified, any DFC 3 conditions will be corrected before the recruit leaves basic training. The most common urgent dental needs are usually those dealing with abscessed teeth requiring endodontic treatment, nonrestorable teeth and malposed wisdom teeth requiring extraction, severe caries, acute gingival disease, and other acute oral conditions. The specifics and timing of urgent dental treatment varies in the Navy and Marine Corps during the recruit training curriculum.

Navy and Marine Corps recruits who present with extensive dental disease or needs are referred to the appropriate specialists. Extensive dental needs may include full-mouth rehabilitation because of severe car-

ies or tooth loss; maxillofacial deformity, such as cleft palate; and radiographic defects, such as radiopaque or radiolucent areas in the orofacial site. Recruits whose extensive dental needs will impact negatively on their ability to maintain a training regimen and/or delay entry into regular military service may require evaluation for early separation from military service.

The Navy conducts all of its basic training at the Great Lakes Recruit Training Command (RTC), located at the Great Lakes Naval Services Training Center (NSTC) near Chicago, Illinois. However, recruit dental care is provided at two dental treatment clinics located at the RTC compound at NSTC. Marine basic training is performed at two Marine Corps Recruit Depots in Parris Island, South Carolina, and in San Diego, California. Naval Dental Corps officers perform dental care at these locations, in a sequence similar to Navy basic training.

The 8-week Navy recruit training cycle begins after "P-Week," the first week after arrival during which in-processing takes place. During P-Week, all recruits receive their dental in-processing through the USS *Red Rover* Branch Dental Clinic (BDC [the buildings at NSTC are all named for ships]). The initial dental record is developed on P-2 (the second day of P-Week after arrival at RTC). This day is devoted to preparing the dental record paperwork and acquiring bitewing and panoramic radiographs. On P-4, the recruit receives a comprehensive dental examination. The findings of this examination are placed in the dental record and are entered into the Dental Common Access System (DENCAS) computerized database. If time permits, routine urgent dental care is provided at the USS *Red Rover* BDC.

After the initial dental examination at the Red Rover clinic is complete, the physical and electronic dental records are collected and delivered to the second RTC dental clinic, the USS *Osborne* BDC. The Osborne clinic is the largest BDC in the Navy and is able to treat all areas of identified urgent dental needs. During the first full week of recruit training, the records are reviewed for treatment evaluation and scheduling. By using the electronic DENCAS data, the USS *Osborne* staff members evaluate treatment needs and prepare for the 2-1 day of training (DOT) (ie, the first day of the second week of training), during which recruits are scheduled for their initial dental care.

Almost all applications of sealants, treatment for caries and acute gingivitis, and specialty evaluations are done on 2-1 DOT. The oral surgery department treats some patients on 2-1 DOT, but recruits also receive oral surgery treatment later in the training cycle as time permits (Exhibit 19-2). Treatment not completed on 2-1 DOT is provided during recall ap-

pointments spread throughout the remaining 6 weeks of the training schedule.

US Air Force Recruit Dental Care

The Air Force Dental Service has responsibility for the operational dental readiness of all airmen. Dental readiness is assessed within the first week of the 6-week enlisted basic military training (BMT) cycle at Lackland Air Force Base in San Antonio, Texas. Air Force Instruction 36-2110 delineates the general procedure to identify and initiate appropriate treatment of Air Force recruits who enter Basic Military Training School (BMTS), including those recruits with significant dental abnormalities. This includes conditions that could affect the recruit's ability to support the mission of the Air Force or disqualify the recruit from military service. The objective of this initial assessment is to identify airmen who have a higher probability of presenting with a dental emergency within the first 12 months of service.

During the first week of BMT, the dental record is initiated, a dental panoramic radiograph is made, and a dental screening questionnaire for conditions that existed prior to service is completed. Based on

their responses to the dental screening questionnaire, trainees may receive an interview or a clinical oral examination, and may also be reevaluated for service suitability.

The officer in charge of dental processing, or an appropriately trained designee, is responsible for reviewing each panoramic radiograph for diagnostic acceptability and for identifying trainees with significant dental pathology. Panoramic radiographic findings are recorded on a Standard Form 603 in the dental record as "exam type 5, initial screening evaluation." Trainees with chronic dental conditions or pathology (extensive caries, abscesses, infections, etc) likely to result in a dental emergency are designated as DFC 3. Based on the individual's particular dental needs and the available dental support, DFC 3 recruits may be further placed on dental hold status or identified for priority care. As Air Force Instruction 36-2110 requires, trainees receive the required care as expeditiously as possible between the time BMTS ends and before their technical school begins. The goal is not to exceed 10 calendar days. Treating nonacute or nonemergency dental needs of trainees prior to their beginning technical training school is not a requirement; however, BMT and technical training students in need of acute

EXHIBIT 19-2

IMPAIRED POSTSURGICAL HEALING

About 68% of recruits need at least one tooth extracted, which requires oral surgery.¹ Increased hormone levels associated with the use of hormone supplements, such as oral contraceptives, can interfere with postsurgical healing. Women who use oral contraceptives are twice as likely to develop alveolar osteitis (AO; also called dry socket) after dental extraction.² AO presents as severe pain that is usually refractory to routine postextraction analgesics and is associated with necrosis or blood clot loss, with or without exposed alveolar bone.

AO pain can be significantly reduced by irrigating the socket with saline and placing a dressing of gauze saturated with eugenol (oil of cloves). The dressing can be removed after 48 hours and replaced if necessary until symptoms have subsided (about four treatments are usually required). The patient must also rinse the surgical site with warm salt water or with an antimicrobial mouthwash (such as chlorhexidine gluconate) after each meal to encourage removal of food debris and to promote healing.

AO can be prevented by considering hormonal cycles when scheduling exodontia. Tooth extraction has the least risk of AO during the part of the contraceptive cycle that estrogen is not actually taken. Other factors (such as smoking) have been shown³ to increase the risk of AO. Daily rinsing with chlorhexidine gluconate mouthwash after surgical extraction has been shown⁴ to reduce the incidence of AO.

Data sources: (1) Tri-Service Comprehensive Oral Health Survey Working Group. *Tri-Service Comprehensive Oral Health Survey—Active-Duty Report*. Washington, DC: Office of the Assistant Secretary of Defense for Health Affairs; June 1995. Naval Dental Research Institute-PR 95-03. (2) Garcia AG, Grana PM, Sampedro FG, Diago MP, Rey JM. Does oral contraceptive use affect the incidence of complications after extraction of a mandibular third molar? *Br Dent J*. 2003;194:453–455. (3) Meechan JG, Macgregor ID, Rogers SN, Hobson RS, Bate JP, Dennison M. The effect of smoking on immediate post-extraction socket filling with blood and on the incidence of painful socket. *Br J Oral Maxillofac Surg*. 1988;26:402–409. (4) Ragno JR Jr, Szkutnik AJ. Evaluation of 0.12% chlorhexidine rinse on the prevention of alveolar osteitis. *Oral Surg Oral Med Oral Pathol*. 1991;72:524–526.

care (those with pain, bleeding, or swelling) are treated immediately. Students who are identified for remote overseas assignment also receive treatment for all DFC 3 conditions.

Air Force policy for dental treatment of BMT and technical school trainees is based on the fact that the

vast majority of technical school graduates are assigned to a location in which dental assets are readily available to provide necessary treatment. Because of the stringent BMT and technical school training schedules, there is very limited time to provide dental treatment that is not urgent.

ORAL HEALTH PROMOTION AND INJURY PREVENTION INITIATIVES

Tobacco Use Prevention and Cessation

Effective 1986, all US Army, Navy, Marine Corps, and Air Force recruit training facilities restricted all forms of tobacco use during initial entry training. This decision was based on many factors, including those dealing with health, safety, and readiness. On leaving BMT, military trainees attend a variety of AIT programs in which tobacco use restrictions are variable.

From 1993 to 2000, substantial reductions in smoking prevalence were reported in the United States for all age groups except those aged 18 to 24. An additional issue of tobacco use in the 18- to 24-year age group is the fact that 13% of this group uses smokeless tobacco.²⁰ (According to military demographic data, most military recruits are in this age range.²¹) Between 34% and 60% of recruits entering the military used some form of tobacco before they entered the initial phase of military training.²²⁻²⁴ The enforced abstinence during BMT results in a 26% rate of abstinence after basic training for those previous users of tobacco. Unfortunately, three large, random-controlled studies²⁴⁻²⁶ demonstrated, that among graduated recruits, approximately 74% resume their tobacco use, and approximately 6% to 11% of previous nonusers start using tobacco. Various military services have instituted different policies regarding tobacco use limitations in various training programs beyond recruit training.

In 1998 the DoD ordered a survey of health-related behaviors among military personnel.²⁷ This survey confirmed that, although cigarette smoking was still the most pervasive form of tobacco use in the military, other forms of tobacco were also used. Planners and policymakers must be aware of the prevalence of all types of tobacco use to develop comprehensive policies and programs for tobacco use prevention and cessation. Findings of the 1998 DoD survey revealed that considerable effort is needed to achieve the Healthy People 2010 objectives regarding tobacco use reduction. The survey estimated that 11.7% of military personnel had used smokeless tobacco during the 30 days before the survey, and an estimated 32.6% of the personnel had smoked cigars or a pipe during that same time period.

One DoD program that was designed to take ad-

vantage of the tobacco-free recruit environment is the Navy's Reinforcing Education to Achieve Health (REACH) program. REACH introduces recruits to military readiness, health, and financial benefits that will result if graduated trainees continue their tobacco-free lifestyle. Only 50% of the trainees who used tobacco before this program resumed using it within 30 days of graduation. There was also a 67% reduction of tobacco use initiation.^{23,28}

Given that the rates of any tobacco smoking and use of smokeless tobacco in the entire DoD are all still well above the Healthy People 2010 targets for the armed forces, military leaders should implement educational programs to reduce tobacco use. Using this teachable moment of mandated tobacco abstinence during the various services' initial and follow-on training for junior enlisted members will help reduce the level of tobacco use.

Army Orofacial Injury Reduction

Civilian studies have indicated that athletes have a 10% chance of sustaining an injury to the face or mouth for a single sport during a single playing season.²⁹ A study of 16 Army posts in 1975 over a 9-month period showed that basic training posts had the highest incidence of orofacial injuries of all posts sampled.³⁰

No studies of orofacial injuries in the Army have been conducted since 1975. However, one of the top five injuries leading to hospitalization of active duty Army personnel in 1994 was the fracture of facial bones.³¹ Service members experience orofacial trauma during military training events (such as pugil stick training, combatives, bayonet training, rappelling, obstacle course, orienteering through land navigation courses, and sports) and after duty hours. Considering that many service members play multiple sports over the course of a year, their odds for orofacial injury may significantly exceed the 10% risk suggested by civilian studies.

Orofacial injuries result frequently in damage to the teeth and gums. Dental injuries from trauma may result in the fracture of the crown or root of the tooth, which may necessitate root canal therapy, crown repair, tooth extraction, and surgical intervention to

repair the injury. These injuries may be immediate or noted years later. Once the integrity of a tooth has been altered by injury, it can never be repaired to the same strength as before.

Dental injuries can result in significant disfigurement, pain, and emotional stress to the recruit. In addition, dental injuries result in lost training time and significant financial expense to the Army. The average cost to repair a single damaged tooth is, on average, \$1,000.³²

Effectiveness of Mouth Protection

In 1999, the Fort Leonard Wood, Missouri, Dental Command noted that approximately five dental injuries per month were seen in the dental clinics. Most of these injuries were sustained by initial entry training and officer basic course recruits during training activities, particularly pugil stick training. Civilian studies have documented that mouthguards can substantially reduce orofacial injuries during athletic events.³³⁻³⁷ These studies suggested that dental injuries resulting from Army training accidents could be less severe or avoided entirely if mouth protection was used. Thus, a program was instituted to promote its use.

During the Fort Leonard Wood program's first year, mouthguards were required only for pugil stick training. A total of 51 injuries occurred during training or athletic events; the subject matter expert and the dental officers believed that wearing a mouthguard could have prevented 40 (78.4%) of those injuries. Of the pugil stick injuries, 91% occurred to recruits who were not wearing a mouthguard. The other preventable injuries occurred during other training activities in which a mouthguard was not required (eg, M16 use with bayonet training, hand-to-hand combat training, and confidence course training). The rate of preventable injuries was approximately 1.9/1,000/year.

During the second year of the program (January–September 2001), the requirement that a mouthguard be worn was extended to include M16 use with bayonet training, hand-to-hand training, and confidence course training. During this 9-month period, 18 dental injuries were reported; the adjusted injury rate was 0.69/1,000/year. Further data collection for 10 months (from 2002 to 2003) demonstrated the persistence of lowered preventable injuries. The

few trainees wearing mouthguards who were injured sustained only minor orofacial injuries, such as a cut lip or a bruised gum.

The mouthguard program was replicated at two other initial entry training sites in addition to Fort Leonard Wood. Data were collected over 10 months (September 2002–June 2003) from Fort Leonard Wood; Fort Knox, Kentucky; and Fort Jackson, South Carolina. Injuries that occurred during activities where mouthguards are required are now limited to lip lacerations, unless recruits are using improperly fitted mouthguards or unless mouthguard use is not enforced. The majority of preventable injuries now occur during initial tactical training activities (22%) or fights (17.1%). It is important to note that since the mouthguard program was implemented at the participating initial entry training installations, not one recruit wearing a mouthguard lost a tooth during the data collection period.

The Fort Leonard Wood study also demonstrated the cost-effectiveness of mouthguard use. One result of a 63.3% reduction in preventable injuries was the avoidance of approximately 25 injuries per year. Using the cost estimate of \$1,000 per tooth,³² about \$25,000 in injury treatment was avoided. Fort Leonard Wood issued about 24,700 mouthguards to recruits during that year at an expense of about \$0.65 each (for materials and labor)—a total of approximately \$16,050. Therefore, the wearing of mouthguards, by reducing the number of preventable injuries, resulted in a cost savings of approximately \$8,950.

Currently, all Army basic training recruits are provided with mouthguards. Their use is required during high-risk events. Air Force Instruction 47-101 (Chapter 6, Section 6.28.2.3.5) offers the guidance that mouthguards will be constructed when needed. This allows for local interpretation based on the resources available. According to the *USAF Medical Service Dental Clinical Practice Guidelines* (May 2003),

Patients who participate in sports with the potential for injury to the teeth and jaws should be offered protective athletic mouth guards. The mouth guard program should be coordinated with the Services Squadron, the Base Sports Council and/or Fitness Centers or Health Promotions Function (according to locally established process) to ensure that sports participants are aware of the importance of mouth guard wear.³⁸

SUMMARY

Although the dental treatment recruits receive varies according to the specific military service, all US Army, Navy, Marine Corps, and Air Force recruits are classified according to the DoD DFC system. Service

policies vary on how recruits are treated with regard to their dental needs. Until recently only the Navy and Marine Corps fully examined and treated recruits to at least DFC 2 before graduation. The Army has

instituted a program to examine and treat all recruits to at least DFC 2 before they report to their first duty station. The Air Force screens all recruits, but generally defers care until the new airmen reach their first duty assignment.

Dental caries is the most common adolescent disease among 15- to 17-year-olds, and many recruits

just past the age of 17. Consequently, many recruits are entering military service with dental disease, and more than 47% of new recruits will be classified as DFC 3 after examination. The DoD standard is for 95% of the armed forces to be DFC 1 or DFC 2. Therefore, a significant amount of dental treatment is needed in this population.

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