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ORAL HEALTH CARE SERIES

Women's Oral Health Issues

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American Dental Association
Council on Access, Prevention
and Interprofessional Relations

FOREWORD

Women's Oral Health Issues has been developed by the American Dental Association's Council on Access, Prevention and Interprofessional Relations (CAPIR)

Women's Oral Health Issues is one volume in the *Oral Health Care Series* that has been developed to assist in the treatment of individuals with complex medical conditions. The *Oral Health Care Series* began in 1986 and was based on *Clinical Care Guidelines for the Dental Management of the Medically Compromised Patient* (1985, revised in 1990) developed by the Veterans Health Administration, Department of Veterans Affairs. Since that time, the Oral Health Care Series Workgroup enhanced the documents to provide information on treating the oral health of patients with complex medical conditions.

Disclaimer

Publications in the *Oral Health Care Series*, including *Women's Oral Health Issues*, are offered as resource tools for dentists and physicians, as well as other members of the health care team. They are not intended to set specific standards of care, or to provide legal or other professional advice. Dentists should always exercise their own professional judgment in any given situation, with any given patient, and consult with their professional advisors for such advice. The *Oral Health Care Series* champions consultation with a patient's physician as indicated, in accordance with applicable law.

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Preamble

Topics for the volumes in the *Oral Health Care Series* have been carefully chosen. Situations exist where modifications of dental treatment for the welfare of the patient are often necessary because of the patient's medical condition or status or when acute adverse events associated with dental care may be anticipated. Many diseases as well as some treatments are associated with oral manifestations, which may reflect changes in the general health of the patient. The dentist is particularly qualified and trained to diagnose and treat those oral conditions, improving the patient's overall quality of life.

It is beneficial to acquaint the physician with the positive contributions that timely and necessary dental treatment may make in decreasing morbidity and mortality from the patient's disease. An advisory consultation between the dentist and the patient's physician is often desirable to assess the patient's medical status. Medical information obtained from such a consultation should be considered when developing the patient's treatment options, as it is ultimately the responsibility of the dentist to ensure safe and appropriate oral health care management.

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I. BACKGROUND AND RATIONALE

The 2001 Institute of Medicine's Report "Exploring the Biological Contributions to Human Health: Does Sex Matter?" focused international attention on gender-based biology and its implications for women's health. This report states that by understanding the roles of sex and gender in biology, scientists can better understand these effects on disease and its prevention and treatment.

The U.S. Public Health Service's Task Force on Women's Health defined women's health as diseases or conditions that are unique to, more prevalent in or more serious in women; have distinct causes or manifest themselves differently in women; or have different outcomes or require different interventions than men. This definition encompasses oral diseases and conditions.

Women have special oral health needs and considerations. Hormonal fluctuations have a surprisingly strong influence on the oral cavity. Puberty, menses, pregnancy, menopause and use of contraceptive medications all influence women's oral health and the way in which a dentist should approach treatment.

This document will discuss hormonal effects on the oral cavity during various stages in women's lives as well as the special dental needs and considerations that will be encountered. Problems such as osteoporosis, Sjögren's disease, temporomandibular disorders, eating disorders and thyroid disease, prevalent in the female population, will also be addressed.

Dentists should always exercise their own professional judgment in any given situation, with any given patient. This publication does not set any standards of care. Scientific advances, unique clinical circumstances, and individual patient preferences must be factored into clinical decisions. This requires the dentist's careful judgment. Balancing individual patient needs with scientific soundness is a necessary step in providing oral health care. 2

II. ISSUES, MANIFESTATIONS AND DENTAL MANAGEMENT

PUBERTY

INCIDENCE AND PREVALENCE

At puberty, girls have an increase in the production of their sex hormones (estrogen and progesterone) that remains relatively constant throughout their reproductive lives. Data suggest that girls are experiencing puberty at younger ages than previous cohorts. The reason for this earlier occurrence of puberty is not clear.

ORAL MANIFESTATIONS

A number of studies have shown that increased sex hormone levels correlate with an increased prevalence of gingivitis. Gingival tissues and the subgingival microflora respond with a variety of changes to the increasing hormone level at the onset of puberty. Microbial changes have been reported during puberty and can be attributed to changes in the microenvironment seen in the gingival tissue response to the sex hormones as well as the ability of some species of bacteria to capitalize on the higher concentration of hormones present. In particular, some gram-negative anaerobes such as *Prevotella intermedia* have the ability to substitute estrogen and progesterone for vitamin K, an essential growth factor. Another gram-negative bacterium, *Capnocytophagia* species, increases in incidence as well as in proportion. These organisms have been implicated in the increased gingival bleeding observed during puberty.

Clinically during puberty there may be a nodular overgrowth reaction of the gingiva in areas where food debris, materia alba, plaque and calculus are deposited. The inflamed tissues are deep red and may be lobulated, with ballooning distortion of the interdental papillae. Bleeding may occur when patients masticate or brush their teeth. Histologically, the appearance is consistent with inflammatory fibroplasia.

DENTAL MANAGEMENT

Local preventive care, including a vigorous program of good oral hygiene is vital. Mild cases of gingivitis respond well to scaling and improved oral hygiene. Severe cases of gingivitis may require more aggressive treatment, including antimicrobial therapy. If the patient's gingivitis does not respond, more frequent recall during puberty may be indicated.

Appendix 1 lists key questions for the dentist to consider asking the female patient in various stages of their life, as well as their physician. 3

MENSES

INCIDENCE AND PREVALENCE

Women in their reproductive years should experience menses on a regular cycle. Changes or variation in the menstrual cycle or flow should be addressed by the woman and her physician.

ORAL MANIFESTATIONS

Oral changes that may accompany the menses include swollen erythematous gingiva. Some females are not aware of any gingival changes at all, while others complain of bleeding and swollen gingiva in the days preceding the onset of menstrual flow, which usually resolves once menses begins. Other oral changes include activation of recurrent herpes infection; aphthous ulcers; prolonged hemorrhage following oral surgery; and swollen salivary glands, particularly the parotid glands.

DENTAL MANAGEMENT

Local preventive care, including a vigorous program of good oral hygiene is vital. Topical and/or systemic antiherpetic medication may be beneficial for patients experiencing recurrent herpetic outbreaks. Topical corticosteroids may also be indicated for severe aphthous ulcers. Palliative treatment, such as topical anesthetic agents and/or systemic analgesics, may be necessary for the discomfort associated with the aphthous ulcerations and herpetic lesions.

PREGNANCY

INCIDENCE AND PREVALENCE

The CDC's National Center for Health Statistics reported there were 6.4 million U.S. pregnancies in 2000. The 2000 total pregnancy count includes about 4 million live births, 1.3 million induced abortions and 1 million fetal losses (miscarriages and stillbirths). Approximately 10 percent of all women in the age group 15-44 are pregnant. In addition, with advancing medical technology and more women delaying childbearing, there is an increased incidence of women undergoing fertility treatments.

ORAL MANIFESTATIONS

The notion that pregnancy causes tooth loss ("a tooth lost for every child") and that calcium is withdrawn in significant amounts from the maternal dentition to supply fetal requirements has no histologic, chemical or radiographic evidence to support it. Calcium is present in the teeth in a stable crystalline form and, as such, is not available to the 4

systemic circulation to supply a calcium demand. However, calcium is readily mobilized from bone to supply these demands.

Caries
The relationship between dental caries and pregnancy is not well defined. The more comprehensive clinical studies suggest that pregnancy does not contribute directly to the carious process. It is most probable that when an increase in caries activity is noted, it can be attributed to an increase in local cariogenic factors. Pregnancy causes an increase in appetite and often a craving for unusual foods. If these cravings are for cariogenic foods, the pregnant woman could increase her caries risk at this time.

Acid erosion of teeth (perimylolysis)
Acid erosion rarely occurs as the result of repeated vomiting associated with morning sickness or esophageal reflux. Women can be instructed to rinse the mouth with water immediately after vomiting so that stomach acids will not remain in the mouth.

Gingival inflammation
Gingivitis is the most prevalent oral manifestation associated with pregnancy. It has been reported to occur in 60 to 75 percent of all pregnant women. Gingival changes usually occur in association with poor oral hygiene and local irritants, especially plaque. However, the hormonal and vascular changes that accompany pregnancy often exaggerate the inflammatory response to these local irritants.

Clinically, the appearance of inflamed gingiva during pregnancy is characterized by a fiery red color of the marginal gingiva and interdental papillae. The tissue is edematous, with a smooth, shiny surface, loss of resiliency and a tendency to bleed easily. There may also be increased pocket depth with minimal loss of attachment apparatus (pseudopocket). Gingival changes are most noticeable from the second month of gestation, reaching a maximum in the eighth month. These changes occur earlier and more frequently anteriorly than in posterior areas. The severity of gingival disease is reduced after childbirth, but the gingiva does not necessarily return to its pre-pregnancy condition.

In addition to generalized gingival changes, pregnancy may also cause single, tumor-like growths, usually on the interdental papillae or other areas of frequent irritation. This localized area of gingival enlargement is referred to as a pregnancy tumor, epulis gravidarum or pregnancy granuloma. The histologic appearance is a pyogenic granuloma. It may occur in up to 10 percent of pregnant women. The lesion occurs most frequently on the labial aspect of the maxillary anterior region during the second trimester. It often grows rapidly, although it seldom becomes larger than 2 cm in diameter.

A pregnancy tumor classically starts to develop in an area of an inflammatory process. Poor oral hygiene is invariably present, and often there are deposits of plaque or calculus 5

on the teeth adjacent to the lesion. The gingiva enlarges in a nodular fashion to give rise to the clinical mass. The fully developed pregnancy tumor is a sessile or pedunculated lesion that is usually painless. The color varies from purplish red to deep blue, depending on the vascularity of the lesion and the degree of venous stasis. The surface of the lesion may be ulcerated and covered by yellowish exudate, and gentle manipulation of the mass easily induces hemorrhage. Bone destruction is rarely observed around pregnancy tumors.

Generally, the lesion will regress postpartum; however, surgical excision is often required for complete resolution. Before parturition, scaling and root planing, as well as intensive oral hygiene instruction, may need to be initiated to reduce the plaque retention.

In cases when it is uncomfortable for the patient, disturbs the alignment of the teeth or bleeds easily on mastication, the patient may seek treatment. When the pregnancy tumor interferes with function, it needs to be excised. Pregnancy tumors excised before term may recur; therefore, the patient should be advised that revision of the surgical procedure may have to be performed postpartum.

Tooth mobility
Generalized tooth mobility may also occur in the pregnant patient. This change is probably related to the degree of periodontal disease disturbing the attachment apparatus. This condition usually reverses after delivery.

Xerostomia
Some pregnant women complain of dryness of the mouth. Hormonal alterations associated with pregnancy are a possible explanation. More frequent consumption of water and sugarless candy and gum may help alleviate this problem.

Ptyalism/Sialorrhea
A relatively rare finding among pregnant women is excessive secretion of saliva, known as ptyalism or sialorrhea. It usually begins at two to three weeks of gestation and may abate at the end of the first trimester. In some instances, it continues until the day of delivery.

Periodontal Disease and Preterm Low Birth Weight Infants
In the United States, about 10 percent of all births are low birth weight infants. The March of Dimes has reported that 25 percent of women who deliver a low birth weight infant have no known risk factors. Maternal risk factors for preterm low birth weight (PLBW) include: age, low socioeconomic status, alcohol and tobacco use, diabetes, obesity, hypertension and genitourinary tract infections. PLBW results in significant morbidity and mortality of infants.

Research over the past several years has demonstrated an association between maternal infection and PLBW. Additional research suggests that periodontal disease may 6

represent a previously unrecognized risk factor for PLBW. Oral health care for the pregnant woman should include an assessment of her periodontal status and if diagnosed, at a minimum should include prophylaxis or scaling and root planing to decrease the infection and subsequent inflammation caused by the disease.

DENTAL MANAGEMENT

The evaluation of the pregnant patient begins with a thorough history. Indications of high-risk pregnancy such as previous miscarriages, recent cramping or spotting warrant consultation with the obstetrician prior to initiating dental treatment.

The most important objectives in planning dental treatment for the pregnant patient are to establish a healthy oral environment and to obtain optimum oral hygiene levels. These are achieved by means of a good preventive dental program consisting of nutritional counseling and rigorous plaque control measures in the dental office and at home.

Women undergoing fertility treatment do not require any modification of dental treatment. However, consultation with the treating physician is advisable.

Preventive Program

Nutrition – The quality of the diet affects caries formation and pregnancy gingivitis. Diet is also important for the developing dentition in the fetus. Pregnant patients normally receive nutritional guidance from their obstetricians, which may be reinforced by the dental team. It is imperative that the mother's diet supply sufficient levels of needed nutrients, including vitamins A, C and D; protein; calcium; folic acid; and phosphorus. Patients should select nutritious snacks, but because so many foods contain sugars and starches that can contribute to caries development, it is advisable to limit the number of times they snack between meals.

Plaque control – Pregnant patients should maintain a good plaque control program to minimize the exaggerated inflammatory response of the gingival tissues. The heightened tendency for gingival inflammation may be clearly explained to the patient so that acceptable oral hygiene techniques may be taught, reinforced and monitored throughout pregnancy. Scaling, polishing and root planing may be performed whenever necessary throughout the pregnancy. If periodontal disease is diagnosed, scaling and root planing should be implemented to decrease the inflammation caused by the periodontal infection.

Prenatal fluoride – The American Academy of Pediatrics has adopted the Centers for Disease Control and Prevention (CDC) Recommendations for using fluoride to prevent and control caries in the United States which states "the use of fluoride supplements by pregnant women does not benefit their offspring." The American Academy of Pediatric Dentistry has stated, "the efficacy of prenatal fluoride is still equivocal, although its use in fluoride-deficient communities (less than 0.3 ppm F) is considered to be safe for both the mother and the fetus." 7

Elective dental treatment – Elective dental care should be timed to occur during the second trimester and first half of the third trimester. The first trimester is the period of organogenesis when the fetus is highly susceptible to environmental influences. In the last half of the third trimester, the woman may be less comfortable sitting in the dental chair and there is a possibility that supine hypotensive syndrome may occur. In a semi-reclining or supine position, the great vessels, particularly the inferior vena cava, are compressed by the gravid uterus. By interfering with venous return, this compression will cause maternal hypotension, decreased cardiac output and eventual loss of consciousness. Supine hypotensive syndrome can usually be reversed by turning the patient on her left side, thereby removing pressure on the vena cava and allowing blood to return from the lower extremities and pelvic area. Women who experience this will often report that they sleep partially sitting up or on their side. Extensive reconstruction procedures and major surgery should be postponed until after delivery.

Emergency dental treatment – Dental emergencies should be dealt with as they arise throughout the entire pregnancy. The management of pain and elimination of infection that otherwise could result in increased stress for the mother and endangerment of the fetus are hallmarks of emergent dental care. Emergency treatment calling for sedation/general anesthesia necessitates consultation with the patient's obstetrician, as does any uncertainty about prescribing medication or pursuing a particular course of treatment.

Dental radiographs – Dental radiographs may be needed for dental treatment or a dental emergency that cannot be delayed until after the baby is born. Untreated dental infections can pose a risk to the fetus, and dental treatment may be necessary to maintain the health of the mother and child. Radiation exposure from dental radiographs is extremely low. However, every precaution should be taken to minimize any exposure by use of high-speed film, filtration, collimation, and protective abdominal and thyroid shielding. Abdominal shielding minimizes exposure to the abdomen and should be used when any dental radiograph is taken. Studies have shown that when a leaded apron is used during dental radiography, gonadal and fetal radiation is negligible. A protective thyroid collar can protect the thyroid from radiation, and should be used whenever possible. The use of a thyroid collar is strongly recommended for women of childbearing age, pregnant women and children. Dental radiographs are not contraindicated if one is trying to become pregnant or is breast feeding. When possible, x-rays should be delayed until after the pregnancy.

Medications – Drugs given to a pregnant woman can affect the fetus. In 1979, the FDA established a classification system to rate fetal risk levels associated with many prescription drugs (Table 1). Additionally, references such as ADA Guide to Dental Therapeutics, Briggs Drugs in Pregnancy and Lactation or Drug Facts and Comparisons or Drug Information Handbook for Dentistry are available for information on the prescription drugs associated with pregnancy risk factors. 8

Most of the commonly used drugs in dental practice can be given during pregnancy with relative safety, although there are a few important exceptions. The table of drugs presented in Table 2 is considered to be a general guideline. Obviously, drugs in category A or B are preferable for prescribing. However, many drugs that fall into category C are sometimes administered during pregnancy. These drugs will present the greatest challenge for the dentist and physician in terms of therapeutic and medicolegal decisions. Consulting the patient's physician may be advisable prior to prescribing any medications during pregnancy.

Breastfeeding – During breastfeeding, there is a risk that the drug can enter the breast milk and be transferred to the nursing infant, in whom exposure could have adverse effects. There is little conclusive information about drug dosage and effects via breast milk. Retrospective clinical studies and empirical observations coupled with known pharmacologic pathways allow recommendations to be made. The amount of drug excreted in breast milk is usually not more than 1 to 2 percent of the maternal dose; however for some drugs used in dentistry, such as metronidazole, the amount excreted can be up to one-third of the maternal dose.

Table 2 also lists recommendations regarding administration of commonly used dental drugs during breastfeeding. These recommendations are general guidelines only; as with drug use in pregnancy, individual physicians may wish to modify these suggestions.

In addition to choosing drugs carefully, it is desirable for the mother to take the drug just after breastfeeding and then to avoid nursing for four hours or more if possible. If there is serious concern about the drug passing to the child through the breast milk, particularly narcotics or anti-anxiety agents, the mother may elect to pump the breast milk and discard it after taking the medication. This will markedly decrease the drug concentration in breast milk that is consumed by the child.

Early Childhood Caries (ECC), formerly known as Baby Bottle Tooth Decay (BBTD) – When discussing preventive oral health with the patient, it is advisable to mention the condition known as Early Childhood Caries (formerly known as Baby Bottle Tooth Decay or BBTD) for the benefit of the mother and other caregivers. ECC is an easily preventable condition affecting primary teeth. Early signs of ECC are white demineralized lines at the cervical areas of the maxillary anterior deciduous teeth. It is caused by frequent and prolonged exposure of the primary teeth to fluids containing sugars such as breast milk, milk, formula, fruit juice and other sweetened liquids provided during feeding. It can occur when a mother breastfeeds her child at will during the night, or puts the child to bed with a bottle holding a sugar containing liquid at night. Children who carry "sippy cups" all day with liquids containing sugar are also at risk of ECC. Caring for the pregnant woman provides an opportunity to counsel her about the prevention of ECC by avoiding certain feeding practices. 9

ORAL, TRANSDERMAL AND IMPLANTED CONTRACEPTIVES

INCIDENCE AND PREVALENCE

The number of women taking oral contraceptives has reached an estimated 8 million to 10 million in the United States and 50 million worldwide. As a result of such widespread use, many systemic and oral side effects have been identified.

ORAL MANIFESTATIONS

Oral contraceptives can exacerbate patients' inflammatory status, causing erythema and an increased tendency toward gingival bleeding. In some instances, oral contraceptives have been reported to induce gingival enlargement.

All studies recording changes in gingival tissues associated with oral contraceptives were completed when contraceptive concentrations were at much higher levels than are available today. A recent clinical study evaluating the effects of oral contraceptives on gingival inflammation in young women found these hormonal agents to have no effect on gingival tissues. From these data, it appears that current compositions of oral contraceptives probably are not as harmful to the periodontium as were the early formulations. Nonetheless, a controlled oral hygiene program that includes regular oral examinations, professional cleanings and plaque control will minimize the effects of oral contraceptives. These drugs also may increase the incidence of local alveolar osteitis after extraction of teeth.

Reports have shown significant increased risk for developing myocardial infarction and strokes in women who concomitantly smoke and take oral contraceptives. This may be a more important issue among women older than 30 years.

Saliva
Measurable changes have been observed in the salivary components and flow in women taking contraceptive medications. These changes include a decrease in concentrations of protein, sialic acid, hydrogen ions and total electrolytes. Studies have shown both an increase and decrease in salivary flow.

Localized osteitis ("dry socket")
It has been reported that women taking contraceptive medications may experience a higher incidence of localized osteitis following extraction of teeth. However, no additional preventive procedures are recommended at the time of extractions and treatment for patients developing localized osteitis is according to the clinician's dry socket protocol. 10

Interaction between oral contraceptives and antibiotics

Antibiotic interference with contraceptive medication levels is controversial. Although results from animal studies support antibiotic interference with contraceptive levels, studies in humans have presented conflicting results. For most antibiotics, the mechanism of interference is at the level of the enterohepatic recirculation of the contraceptives.

DENTAL MANAGEMENT

A comprehensive medical history and assessment of vital signs, including blood pressure, are extremely important in this group of patients. Treatment of gingival inflammation exaggerated by oral contraceptives should include establishing an oral hygiene program and eliminating all local predisposing factors. Periodontal surgery may be indicated if there is inadequate resolution after initial therapy (scaling, root planing and curettage). Antimicrobial mouthwashes may be indicated as part of the home care regimen.

A recent report from the ADA Council on Scientific Affairs noted that, considering the possible consequences of an unwanted pregnancy, when prescribing antibiotics to a patient using oral contraceptives, the dentist should:

- advise the patient to maintain compliance with oral contraceptives when concurrently using antibiotics.
- advise the patient of the potential risk for the antibiotic's reduction of the effectiveness of the oral contraceptive.
- recommend that the patient discuss with her physician the use of an additional nonhormonal means of contraception.

Although in the literature, oral manifestations have been attributed to oral contraceptive use, it can be presumed that the same effects could occur with the use of other contraceptive medications (e.g., implants, transdermal patches). 11

EATING DISORDERS

Eating disorders are a serious issue in women's health today, and one that is growing in prevalence and magnitude. The impact of anorexia and bulimia on oral health can be severe.

Bulimia nervosa and anorexia nervosa share common features, the most prominent of which are an over-concern with body shape and/or weight and are markedly more prevalent in women relative to men. Nevertheless, they are distinct and separate disorders.

Bulimia nervosa is a syndrome characterized by recurrent episodes of binge eating, defined as rapid consumption of large quantities of food in a short time. Accompanying the binge eating is a perceived lack of control over eating during a binge and use of self-induced vomiting, laxatives or diuretics, fasting or exercise to prevent weight gain.

Anorexia nervosa is a disorder characterized by a refusal to maintain body weight over a minimal normal weight for age and height. Intense fear of gaining weight or becoming fat and a distorted body image also characterize anorectic individuals.

INCIDENCE AND PREVALENCE

These disorders disproportionately affect women (90 percent) compared to men (10 percent). Bulimia nervosa is estimated to affect 1 to 5 percent of the population. Most bulimic patients are in their late adolescent or early adult years. Anorexia nervosa affects an estimated 1 percent of young women between ages 12 to 30. The overall incidence is estimated to be 0.24 to 7.3 cases per 100,000 per year. These disorders primarily affect white middle-class women, rarely occurring in African-American or Asian-American women. Women and men who participate in certain occupations or activities that focus on body shape and weight, such as modeling, gymnastics, wrestling, track or ballet dancing, may be at greater risk for these disorders.

ORAL MANIFESTATIONS

Dentition

The most dramatic oral problems seen in eating-disordered individuals stem from self-induced vomiting. While this symptom is more characteristic of the syndrome of bulimia nervosa, a sub-group of anorectic individuals also engage in self-induced vomiting with or without prior binge eating.

The most common effect of chronic regurgitation of gastric contents is smooth erosion of the lingual surfaces of the upper teeth or perimylolysis. This results from the chemical effects caused by regurgitation of the gastric contents. When the posterior teeth are affected, there is often a loss of occlusal anatomy. Perimylolysis is usually clinically 12

observable after the patient has been binge eating and purging for at least two years.

There appears to be a relationship between the extent of tooth erosion and the frequency and degree of regurgitation, as well as with oral hygiene habits. Some patients do not regurgitate all of the low pH stomach contents and thereby avoid severe enamel erosion. Destruction of tooth structure can also be avoided by adhering to scrupulous oral hygiene practices (with the exception of immediate toothbrushing) after vomiting. The patient may complain of severe thermal sensitivity, or the margins of restorations on posterior teeth may appear higher than adjacent tooth structures. There may be occlusal changes such as anterior open bite and loss of vertical dimension of occlusion caused by loss of occlusal and incisal tooth structure.

Salivary Glands

Enlargement of the parotid glands, and occasionally the sublingual and submandibular glands, are frequent oral manifestations of the binge-purge cycle in people with eating disorders. The incidence of unilateral or bilateral parotid swelling has been estimated at 10 to 50 percent. The occurrence and extent of parotid swelling is proportional to the duration and severity of the bulimic behavior. The onset of swelling usually follows a binge-purge episode by several days. In the early stages of the disorder, the enlargement is often intermittent and may appear and disappear for some time before becoming persistent. When it does persist, the cosmetic deformity, which imparts a widened, squarish appearance to the mandible, is likely to compel the individual to seek treatment. Unfortunately, there is no recommended treatment to reduce the size of the glands. To date, only counseling with cessation of purging is available as a recommended treatment modality, resulting in possible spontaneous regression.

Parotid swelling is soft to palpation and generally painless. Intraoral examination generally reveals a patent duct, normal salivary flow and absence of inflammation. Histologically, greater acinar size, increased secretory granules, fatty infiltration and non-inflammatory fibrosis have been reported.

The etiology of this salivary gland swelling is still not identified, but most investigators have associated it with recurrent vomiting. The mechanisms, in this case, may be cholinergic stimulation of the glands during vomiting or autonomic stimulation of the glands by activation of the taste buds.

There also have been reports of reductions in unstimulated salivary flow rates in patients who binge eat and induce vomiting. Salivary flow rate may also be affected by abuse of laxatives and diuretics. Many investigators have noted xerostomia in their patients and have related it to this reduction in flow, as well as to chronic dehydration from fasting and vomiting.

Periodontium

Poor oral hygiene is more common in anorectic than bulimic patients. In such cases, 13

higher plaque indices and gingivitis are likely clinical findings. Some investigators have observed that xerostomia and nutritional deficiencies may cause generalized gingival erythema.

Oral Mucosa
The oral mucous membranes and the pharynx may be traumatized in patients who binge eat and purge, both by the rapid ingestion of large amounts of food and by the force of regurgitation. The soft palate may be injured by objects used to induce vomiting, such as fingers, combs and pens. Dryness, erythema and angular cheilitis have also been reported.

DENTAL MANAGEMENT

If the dentist suspects a patient may have an eating disorder, a general screening question regarding any difficulty with eating or maintaining weight is recommended. This may lead to more direct questions, especially if the dental impact is marked. Oral manifestations should be brought to the patient's attention in a nonconfrontational manner. The patient may or may not admit to having an eating disorder on initial questioning. The dentist can persevere gently during initial and subsequent appointments to open communication about the problem. Once the patient is willing to discuss her eating disorder, referral may be made to a health care professional who is experienced in treating these eating disorders. When young patients are afflicted with the disorder, their parents should be involved in the management of the child.

It is recommended that dental treatment begin with rigorous hygiene and home care to prevent further destruction of tooth structure. Such measures include:

- regular professional dental care.
- in-office topical fluoride application to prevent further erosion and reduce dentin hypersensitivity.
- daily home application of either 1 percent sodium fluoride gel in custom trays or applied with a toothbrush to promote remineralization of enamel OR daily application of 5000 parts per million fluoride prescription dental paste.
- use of artificial salivas for patients with severe xerostomia.
- rinsing with water immediately after vomiting and followed, if possible, by a 0.05 percent sodium fluoride rinse to neutralize acids and protect tooth surfaces. It has been noted that toothbrushing at this time might accelerate the enamel erosion.

Most clinical authorities urge delay of definitive dental treatment, with the exception of palliation of pain and perhaps temporary cosmetic procedures, until the patient is adequately stabilized psychologically. The rationale for this recommendation is that an acceptable prognosis for dental treatment depends on cessation of the binge eating and vomiting habit. Restoration of dental health and especially regaining a normal appearance can be an important aspect of the patient's recovery. For this reason, it is 14

optimal for the dentist to be included in the patient's comprehensive care.

Specific dental restorative plans depend on the severity of the case. Milder cases of erosion with minimal caries may require simple restorations to reduce sensitivity and improve esthetics. Occlusal rehabilitation and full reconstruction with fixed prosthodontics may be required where enamel erosion has involved the posterior teeth and vertical dimension of occlusion has been lost.

Past use of the appetite suppressant phentermine and fenfluramine or Phen-fen, may place the individual at risk for cardiac valvular disease. Those with a history of Phen-fen use for at least four months should have an echocardiogram and cardiac evaluation by a physician to determine the need for antibiotic prophylaxis prior to dental procedures that induce bleeding. Appendix 2 provides the *ADA Statement on HHS Warning to Former Phen-Fen Users* on this issue.

TEMPOROMANDIBULAR DISORDERS

Temporomandibular disorders (TMD) represent a spectrum of conditions, including masticatory myalgias, arthritis of the temporomandibular joint (e.g., osteoarthritis, rheumatoid arthritis) and internal derangement of the articular disc. There are many studies indicating these disorders as more common in women with up to a 5 to 1 ratio, female to male, of patients seeking treatment for TMD symptoms. Studies have suggested that the association between these disorders and its manifestations among females may have a hormonal etiology. Many aspects of diagnosis and treatment of these disorders are still controversial. Because of the broad spectrum of these disorders and controversy regarding treatment, these will not be presented in this document, though several excellent reviews are available.

Although more studies are needed on the safety and effectiveness of most TMD treatments, researchers strongly suggest using the most conservative, reversible treatments possible before considering invasive treatments.

MENOPAUSE

INCIDENCE AND PREVALENCE

Menopause, the cessation of menses, is a normal physiologic event experienced by women. It is not an illness or a deficiency and 30 to 50 percent of women have no symptoms as they transition through this phase of their life. After a woman's reproductive years, there is a 5- to 10-year period of menopause-related alterations in hormone patterns. These patterns terminate in a sharp decline of female hormone levels. 15

Perimenopause, the period of time during which the hormones fluctuate, is thought to begin on average at about age 47. The average age for menopause, as defined as the cessation of menstrual flow for one year, for U.S. women is 51 years. Women who smoke and who are thin tend to experience an earlier menopause. The most common symptoms of menopause are hot flashes and night sweats.

The lack of ovarian estrogens appears associated with the onset of several postmenopausal diseases, most notably osteoporosis and heart disease. More than 40 million women take hormone replacement therapy (HRT) to relieve menopausal symptoms, with only 20 percent of them using the regimens for longer than five years.

The Women's Health Initiative (WHI) was implemented to test the effects of HRT on reducing cardiovascular disease and other systemic diseases in postmenopausal women. The WHI tested the effects of estrogen and estrogen/progestin (e.g. Prempro®) compared to a control group that did not take HRT. The estrogen-progestin arm of the study was discontinued in 2002 when an increase in cardiovascular disease, breast cancer and stroke was found in the study population. As a result of these findings from the WHI, new guidelines for the use of HRT were developed. HRT is now recommended for short-term use for control of the vasomotor symptoms of menopause.

ORAL MANIFESTATIONS

Menopause is accompanied by a number of physical changes, some of which occur in the oral cavity. It is not clear whether these conditions are time dependent, that is their frequency increases with advancing age, or whether the hormonal changes associated with menopause are responsible for these oral conditions.

Oral discomfort
Oral discomfort has been reported as a complaint among menopausal and postmenopausal women. They include occurrences of pain, burning sensations, altered taste perception and dryness of the mouth in menopausal and postmenopausal women. Current guidelines for the use of HRT provide no guidance for the relief of oral symptoms.

Oral mucosal changes and symptoms
Changes in the oral mucosa occurring in menopausal women may vary from an atrophic to a pale appearance. The gingiva may appear dry and shiny, bleed easily and range from an abnormally pale color to tissue that is very erythematous. However, some menopausal women with oral discomfort exhibit a clinically normal oral mucosal appearance, suggesting that oral discomfort may be due to other causes. HRT has been of some benefit in reducing oral discomfort in those who have both abnormal and normal mucosal appearance.

Other oral symptoms and complaints of the menopausal patient including xerostomia, 16

abnormal taste sensation and burning sensations have been anecdotally reported to respond favorably to estrogen supplement therapy.

OSTEOPOROSIS

INCIDENCE AND PREVALENCE

Osteoporosis is the most common metabolic bone disease, estimated to affect 75 million people in the United States, Europe and Japan combined. One in two women and one in six men are estimated to sustain an osteoporosis-related fracture by the time they reach age 90.

DISEASE /CONDITION

Osteoporosis is a reduction in bone mass with deformity, pathologic fractures and sometimes associated pain. Osteoporosis leads to more than 1.5 million fractures each year with most of those affecting women. The most common fracture sites are hip, radius and vertebral compression fractures. Vertebral fractures cause the spine to collapse and lead to stooped posture and loss of height. Hip fracture is the most serious consequence of osteoporosis with more than 300,000 occurring every year because of this debilitating disease. Mortality from complications of fractures resulting from the osteoporotic process ranges from 12 to 20 percent.

Osteoporosis is caused by an uncoupling of the bone resorption/formation process with an exaggeration of resorption, reduction in bone formation or a combination of both. In most cases, postmenopausal osteoporosis is due to an abnormal increase in resorption or demineralization and not a decrease in bone formation or remineralization.

Several factors can increase one's chance of developing osteoporosis. Nonmodifiable factors include being female (with Caucasian and Asian women at highest risk; African-American and Latina women are at a lower, but still significant risk); thin, small-boned frame; advanced age; family history of osteoporosis and early menopause (before age 45). Modifiable risk factors include diet low in calcium, sedentary lifestyle, anorexia nervosa or bulimia, cigarette smoking, excessive alcohol intake and prolonged use of certain medications (such as glucocorticosteroids, anticonvulsants, excessive thyroid hormones and certain cancer treatments).

A diagnosis of osteoporosis is made by a bone mineral density (BMD) test, which uses small amounts of radiation to determine the bone density of the spine, hip, wrist or heel. Routine radiographs are not sensitive enough to detect osteoporosis until 25 to 40 percent of the bone mass has been lost, by which time the disease is well advanced. The most commonly used BMD test is DXA – dual energy x-ray absorptiometry. It is a painless, noninvasive procedure. This technique allows for more rapid scanning and improved 17

resolution, resulting in greater precision compared with other techniques. There is evidence to suggest that DXA measurements at the time of menopause may accurately predict future fracture risk.

Serum and urine tests that assess biochemical markers may soon be available to determine how rapidly bone resorption and bone formation is taking place, as well as to identify possible causes of bone loss.

MEDICAL MANAGEMENT

Current recommendations for the prevention of osteoporosis include adequate calcium intake, weight-bearing exercise, tobacco cessation and use of bisphosphonate medications. (Appendix 3 lists the current calcium recommendations for women throughout their lifecycle.) Hormone replacement therapy is no longer considered a recommended treatment for osteoporosis. Calcitonin is a naturally occurring hormone involved in calcium regulation and bone metabolism. In women who are at least five years beyond menopause, calcitonin safely slows bone loss, increases spinal bone density, and according to anecdotal reports provides relief from pain associated with bone fractures. Calcitonin reduces the risk of spinal fractures and may also reduce risk of hip fracture. Studies on fracture reduction are ongoing. Calcitonin is administered by injection or as a nasal spray. Injectable calcitonin may cause an allergic reaction and unpleasant side effects including flushing of the face and hands, urinary frequency, nausea and skin rash. Side effects reported with nasal calcitonin include a runny nose.

Alendronate (Fosamax®) is a bisphosphonate bone resorption inhibitor. It increases bone mineral density in postmenopausal women with osteoporosis. All women over age 50 are advised to maintain adequate calcium intake (see Appendix 3). Patients with a diagnosis of osteoporosis are also advised on vitamin D intake, proper diet, a carefully planned exercise regimen and a program of pain management.

Osteonecrosis of the jaw has been reported with bisphosphonate use. Most cases have been in cancer patients treated with intravenous bisphosphonates (Zometa®, Aredia®), but some have occurred in patients with postmenopausal osteoporosis. Intravenous bisphosphonates are used in the management of women with breast, and other types of, cancer with bone metastases. Osteonecrosis of the jaw may occur spontaneously or, more commonly, following extractions or other trauma. Known risk factors for osteonecrosis include a diagnosis of cancer, concomitant therapies (e.g. chemotherapy, radiotherapy, glucocorticosteroid use), poor oral hygiene, and co-morbid disorders (e.g. pre-existing dental disease, anemia, coagulopathy, infection). A dental examination with appropriate preventive therapy should occur prior to treatment with bisphosphonates in patients with concomitant risk factors. While on treatment, these patients should avoid invasive dental procedures, if possible. Recommendations for dental management of patients on oral bisphosphonate therapy were developed by an expert panel assembled by the ADA's Council on Scientific Affairs (available at 18

www.ada.org/prof/resources/pubs/jada/reports/report_bisphosphonate.pdf). Go to www.ada.org/prof/resources/topics/osteonecrosis.asp for additional information.

Systemic osteoporosis and its effect on oral bone loss
Since osteoporosis is a systemic skeletal disease, investigators have questioned its relationship to decreased bone mass in the maxilla and mandible and its possible effect on periodontal disease. Although the literature supports a relationship between periodontal disease and osteoporosis, the extent of the relationship remains unclear. Many studies included small sample sizes, noncomparable study populations and varying methods to assess periodontal disease.

Generalized bone loss from systemic osteoporosis may render the jaws susceptible to accelerated alveolar bone resorption. The compromised mass and density of the maxilla or mandible in a patient with systemic osteoporosis also may be associated with an increased rate of bone loss around the teeth or the edentulous ridge. Recent studies support the hypothesis that systemic bone loss may contribute to tooth loss in healthy individuals, and women with low bone mineral density tend to have fewer teeth compared to controls.

Although residual ridge resorption was thought to be a local problem caused or promoted by disuse, inflammation or mechanical factors, there now appears to be some evidence to support the idea that it is also a systemic problem. Several reports show a relationship between residual ridge reduction and osteoporosis.

When considering the relationship between osteoporosis and periodontitis, it is believed that osteoporosis is not an etiologic factor in periodontitis but may affect the severity of disease in pre-existing periodontitis. Preliminary data from the oral component of the WHI, which was designed to determine a possible association between systemic osteoporosis and oral bone loss, found a correlation between mandibular basal bone mineral density and hip bone mineral density. Another study suggests that severe osteoporosis that significantly reduces the bone mineral content of the jaws may be associated with less favorable attachment level in the case of periodontal disease.

Recent studies suggest that postmenopausal osteoporosis is a risk indicator for periodontal disease in postmenopausal white women.

DENTAL MANAGEMENT

Osteoporosis
A concern for dentists, especially with regard to removable prosthodontics, is the condition of the mandibular residual ridge. When patients exhibit rapid continuing bone resorption under a well-fitting dental prosthesis, osteoporotic bone loss may need to be considered as contributing to the etiology and pathogenesis of the resorptive process. Postmenopausal osteoporotic women may require new dentures more often after age 50 19

than women without osteoporosis. The bone loss may become so severe that fabrication of a functional prosthesis may become difficult.

Bone regeneration techniques and dental implants may be of significant benefit to an osteoporotic patient who has experienced decreased function of a denture. Because most dental implants depend on sufficient bone volume and density for success, bone regeneration therapy may be necessary prior to implant placement. It appears that there is no contraindication for osseointegrated implant therapy in the osteoporotic patient.

BURNING MOUTH

DEFINITION

Burning mouth syndrome (stomatopyrosis), has been defined as burning pain in the tongue or oral mucous membranes without clinical or laboratory findings. It is characterized by a burning sensation in the tongue or oral mucous membranes when the oral cavity is clinically normal. There is no consensus on the etiology, pathogenesis or treatment for burning mouth syndrome. Burning mouth, without the addition of "syndrome," is a descriptive symptom that could have several defined etiologies.

INCIDENCE AND PREVALENCE

Oral burning occurs most frequently in postmenopausal women. Population-based epidemiologic studies have reported prevalence rates from 0.7 to 2.6 percent. It has been reported in 10 to 40 percent of women presenting for treatment of menopausal symptoms.

Presentation
In more than half of patients with burning mouth, the onset of pain is spontaneous with no precipitating factor. Once the pain starts, it can last for years. In many patients, pain is absent during the night but occurs at a mild to moderate level by middle to late morning. The burning may increase throughout the day, reaching its greatest intensity by late afternoon. Patients have reported that the pain can interfere with their ability to fall asleep. The pain has been characterized from moderate to severe and is similar in intensity to toothache pain.

Little is known about the natural course of burning mouth syndrome. Spontaneous partial recovery within six to seven years has been reported in two-thirds of patients. No clinical factors that predict recovery have been noted.

Etiologic agents
Because much is unknown about burning mouth syndrome, its etiology is also unclear. Several etiologic agents have been identified. Treatment involves identifying an underlying cause and then treating the cause. Conditions such as xerostomia, candidiasis, 20

referred pain from the tongue musculature, chronic infections, reflux of gastric acid, medications, blood dyscrasias, nutritional deficiencies, hormonal imbalances, allergic and inflammatory disorders need to be considered.

Personality and mood changes have been reported in patients with burning mouth syndrome. However, one author notes that while psychologic dysfunction is common in patients with chronic pain, perhaps it is the chronic pain that causes the psychologic dysfunction and not vice versa. The reported success of biobehavioral therapy may be the result of improvements in pain coping mechanisms rather than a cure for the oral burning.

Patients with burning mouth should always be evaluated for any erythematous or ulcerative lesions that can cause pain. Oral candidiasis should always be eliminated as a cause of oral burning in patients who present with a complaint of burning mouth. Hormonal changes are thought to be an etiologic factor in burning mouth, but there is little evidence of the efficacy of hormone replacement therapy in postmenopausal women with this disorder.

Oral dryness has been thought to be an etiologic agent in patients with burning mouth syndrome. However, studies on salivary flow rates have shown no decrease in unstimulated or stimulated salivary flow. Studies have, however, shown an alteration in various salivary components, such as mucins, IgA, phosphates and pH. It is not clear how these qualitative changes can affect patients with burning mouth syndrome.

Case reports have linked burning mouth symptoms to the use of angiotensin-converting enzyme (ACE) inhibitors. Once these medications were discontinued, the symptoms disappeared or were reduced. Loss of taste sensation has also been reported with the use of ACE inhibitors.

DENTAL MANAGEMENT

The management of burning mouth depends on the etiology. On the basis of history, physical evaluation and laboratory studies, the practitioner should rule out all possible organic etiologies. Minimal blood studies should include complete blood count and differential, fasting glucose, iron, ferritin, folic acid, B-12 and a thyroid profile (TSH, T3, T4). Table 3 lists possible causes and management of burning mouth symptoms. If burning persists after the management of systemic and local factors, the diagnosis of burning mouth syndrome is made. Studies support the use of low doses of clonazepam (Klonopin®), chlordiazepoxide (Librium®) and tricyclic antidepressants, such as amitriptyline (Elavil®). Anticonvulsants, such as gabapentin (Neurontin®), have also been used with some success. Studies have not shown benefit from treatment with selective serotonin reuptake inhibitors or other serotonergic antidepressants. Topical capsaicin has been used as a desensitizing agent in patients with burning mouth syndrome. However, capsaicin may not be palatable or helpful in many patients. Table 4 21

lists the medical management of burning mouth syndrome.

SALIVARY DYSFUNCTION AND SJÖGREN'S SYNDROME

DISEASE DESCRIPTION/PROCESS

It has long been assumed that salivary flow decreases with age, but it is now generally accepted that major salivary gland output does not diminish with age if the individual is otherwise healthy. A number of studies have evaluated salivary function of postmenopausal women in an attempt to explain the frequent complaint of oral discomfort, including burning and/or dry mouth. The findings of these studies have likewise presented conflicting results. Some investigators have demonstrated a decreased salivary flow rate accompanying menopause, whereas others have been unable to show a change in quantity of saliva, or salivary flow rate. Furthermore, there was no significant change in salivary flow after the topical application of estrogen on the buccal mucosa or systemic estrogen supplementation.

SJÖGREN'S SYNDROME

INCIDENCE AND PREVALENCE

Dry mouth (xerostomia) is a common complaint, experienced by approximately 10 percent of the general population. In older groups, the prevalence of persistent xerostomia may exceed 25 percent. While there are a number of causes of oral dryness symptoms, most are a result of alterations in salivary gland function. Medications, medical treatments and systemic conditions all can lead to salivary gland dysfunction. Prominent among the systemic disorders is Sjögren's syndrome. As patients with Sjögren's syndrome frequently first complain of xerostomia and oral problems, the dentist is uniquely situated to recognize the condition and facilitate early diagnosis. Timely intervention can alleviate symptoms, prevent some of the complications of this disorder and improve the patient's quality of life.

Sjögren's syndrome is a systemic autoimmune disorder characterized by symptoms of oral and ocular dryness as a result of salivary and lacrimal gland dysfunction, serologic abnormalities and multisystem involvement. Sjögren's syndrome is among the most common rheumatic disorders, with an estimated prevalence of 2 million to 4 million individuals in the United States. There is a marked gender imbalance with women comprising 90 percent of the Sjögren's syndrome population. Diagnosis is commonly made in the perimenopausal or postmenopausal period, although symptoms often have been present for many years.

The specific immunopathogenesis of Sjögren's syndrome is unknown. The disorder may 22

occur alone, in which case it is termed primary Sjögren's syndrome, or in association with another connective tissue disorder. In the latter case it is called secondary Sjögren's syndrome. Associated conditions include rheumatoid arthritis, systemic lupus erythematosus and primary biliary cirrhosis. Patients with both primary and secondary Sjögren's syndrome have prominent serologic findings, including elevated immunoglobulins, antinuclear antibodies (ANA), rheumatoid factors and autoantibodies directed against SS-A and SS-B antigens (Anti-SS-A, Anti-SS-B). The most consistent symptom, reported by more than 95 percent of patients with Sjögren's syndrome, is dry mouth.

MEDICAL MANAGEMENT

Diagnosis is based on the presence of signs and symptoms of salivary and lacrimal gland involvement and serologic markers. Recently, classification criteria were revised to assist in diagnosis. The diagnosis may be made if at least four of six criteria are satisfied. The criteria include evidence of symptoms of dry mouth and dry eyes determined by responses to specific questions, objective evidence of lacrimal and salivary dysfunction and laboratory markers. Definitive diagnosis requires that one of the four positive criteria be either autoantibodies or a positive salivary biopsy. The salivary biopsy is usually done on the minor salivary glands of the lower lip and demonstrates a characteristic focal, periductal mononuclear cell infiltrate.

Medical management focuses on symptoms and associated conditions, as there is no specific treatment for Sjögren's syndrome. A number of systemic agents that are useful in rheumatoid arthritis and lupus erythematosus have been studied or are being tested in the treatment of Sjögren's syndrome. At present, none is an approved therapy. Patients with Sjögren's syndrome are followed closely for any evidence of lymphoma, as there is an increased risk of development of B-cell lymphomas, often of the salivary glands. Enlargement of the glands or lymphadenopathy in any area should be aggressively investigated.

DENTAL MANAGEMENT

If patients complain of a dry mouth or have signs of salivary hypofunction (increased caries, mucosal dryness, oral candidiasis), the possibility of Sjögren's syndrome should be considered. They should be questioned further about eye dryness and other connective tissue conditions. Other dryness symptoms (dry nose, throat, skin, vagina, difficulty swallowing or speaking) also support the diagnosis.

Regular dental care is critical to successful management of Sjögren's syndrome. Patients require more frequent dental evaluations, supplemental fluorides and impeccable oral hygiene. Diet counseling should stress a low cariogenic diet and sugar-free foods and snacks. Oral fungal infections may be recurrent and necessitate lengthy treatment. Periodic salivary gland enlargement may occur and become persistent. Infection and 23

lymphoma must be ruled out in these cases. Dryness symptoms are managed with frequent sips of water, saliva replacement products and oral rinses and gels. Increased local humidification, particularly at night, may be beneficial. Systemic sialogogues available by prescription such as pilocarpine (Salagen®) and cevimeline (Evoxac®), will transiently increase salivary output and relieve xerostomia. Many patients find these salivary stimulants helpful and these agents are a significant advance in the management of dry mouth.

Sjögren's syndrome patients tolerate dental treatment well. No specific modifications are necessary in treatment, although the dentist should be cognizant that dry mucosal tissues may be painful or friable and need to be hydrated frequently. Composite materials may have a shortened life span due to the drier oral environment. Although extensive clinical trials have not been conducted, clinical experience suggests that implants may be used successfully in patients with Sjögren's syndrome.

THYROID DISORDERS

INCIDENCE AND PREVALENCE

An estimated 13 million Americans have thyroid disorders, marked either by an underactive thyroid gland that leads to hypothyroidism or an overactive thyroid gland that leads to hyperthyroidism. More than half of them remain undiagnosed. Thyroid disease occurs with much greater frequency (five to eight times more often) in women than in men. This is probably because thyroid disease is often autoimmune (antibody mediated) and most autoimmune conditions are more common in women. A woman's lifetime risk of developing a thyroid disorder is estimated at 12.5 percent.

Between 10 and 20 percent of women will have thyroid dysfunction following pregnancy. Called postpartum thyroiditis, this inflammation of the thyroid gland often goes undiagnosed, as it is a painless condition and its symptoms, such as nervousness, fatigue, weight loss and emotional changes, are often attributed to the natural postpartum state. In postpartum thyroiditis, there is an initial hyperthyroid phase that may last two to three months, which is then followed by a hypothyroid phase of up to nine months. Only 10 percent of these women are left with permanent dysfunction.

Hypothyroidism occurs most frequently in women entering menopause, which typically occurs in their late 40s and early 50s. As many as 17 percent of women have an underactive thyroid by age 60.

DISEASE/CONDITION

The thyroid gland, which is located in the neck, secretes the hormones thyroxine (T4) and triiodothyronine (T3), necessary for growth and proper metabolism. The gland plays an 24

important role in the growth and mental development of both the fetus and child. It continues to play an important role in regulating heart rate and weight during adulthood. Metabolic disorders occur when the thyroid secretes too little or too much hormone.

Hyperthyroidism: Hyperthyroidism in women occurs most commonly in their 20s and 30s. The diagnosis of hyperthyroidism is confirmed by blood tests that show a decreased thyroid stimulating hormone (TSH) level and elevated T4 and T3 levels. A radioactive iodine scan will also show an enlarged thyroid gland that is over-functioning.

The most common form of hyperthyroidism, Graves' disease, is an autoimmune condition that results in the overproduction of thyroid hormone by an enlarged thyroid gland. The classic features of increased production of thyroid hormone (see Table 5) and a diffusely enlarged thyroid gland (goiter) may be accompanied by exophthalmos (protrusion of the eyes) and edema (swelling) of the legs. When women are in their 70s and 80s, hyperthyroidism is often the result of toxic modular goiter (Plummer's disease), where thyroid nodules or lumps excrete excess thyroid hormone and women present with apathy, depression, weight loss, accelerated osteoporosis and dysrhythmias. Oral manifestations include increased susceptibility to caries, burning mouth syndrome, periodontal disease and presence of extraglandular thyroid tissue on the lateral posterior tongue.

Hypothyroidism: A common form of hypothyroidism results from the treatment of Graves' disease with radioactive iodine. Hashimoto's thyroiditis is the most common non-drug induced form of hypothyroidism. In this condition, antibodies are produced against the TSH receptor that inhibits production of thyroid hormone. Oral manifestations include salivary gland enlargement, dysgeusia, glossitis, macroglossia and compromised periodontal health.

MEDICAL MANAGEMENT

The treatment of choice for hypothyroidism is levothyroxine sodium (Synthroid®), a synthetic T4 hormone tablet that replaces missing thyroid hormone.

Excess thyroid hormone production in hyperthyroidism may be curbed through either 1) antithyroid drugs, such as propylthiouracil (PTU) or methimazole (Mercazole®, Thyrozole®) used to inhibit thyroid hormone biosynthesis, 2) radioactive iodine treatment, which inactivates the thyroid tissue, or 3) through surgery to remove part or all of the thyroid gland. Patients often take synthetic thyroid hormones to restore normal thyroid function after thyroid ablative procedures.

DENTAL MANAGEMENT

Prior to treatment, signs and symptoms of thyroid disease should be assessed. If undiagnosed thyroid disease is suspected, women should be referred for medical 25

evaluation prior to undertaking elective dental treatment. Initiating treatment for thyroid gland dysfunction can improve the quality of life of the affected woman. At treatment visits, vital signs should be obtained, with attention placed on heart rate and blood pressure.

For uncontrolled hyperthyroid women, epinephrine should be avoided and only emergent procedures should be performed. Brief appointments and stress management are important. Atrial fibrillation is found in 20 percent of older patients with hyperthyroidism. Nonsteroidal antiinflammatory drugs should be used with caution and aspirin avoided as these may increase circulating T4 levels and lead to thyrotoxicosis.

Although rare, thyroid storm or thyrotoxic crisis, an acute medical emergency, may be precipitated by dental treatment or acute infections in the untreated or inadequately treated hyperthyroid patient. Early symptoms include: extreme restlessness, tremor, nausea, vomiting, abdominal pain, fever, profuse sweating, marked tachycardia, cardiac arrhythmias and pulmonary edema. If untreated it may lead to congestive heart failure, stupor, coma and death. Recognition and immediate management in the dental setting consists of seeking medical aid, use of icepacks and fans, intravenous glucose and hydrocortisone, and if necessary, cardiopulmonary resuscitation. Medical treatment may also require large doses of antithyroid drugs, potassium iodide, propranolol, dexamethasone and vitamin B complex.

For untreated hypothyroid women, central nervous system depressants, sedatives and narcotic analgesics should be used with caution (reduced doses) as they may have exaggerated effects. In those with severe disease, these drugs, surgical procedures or oral infections may precipitate myxedematous coma.

VIOLENCE AGAINST WOMEN

Intimate Partner Violence (IPV), also known as “spousal abuse,” “domestic violence” or “violence against women” is epidemic in this country. The preferred term of IPV recognizes that this violence also occurs outside of marriage and in gay and lesbian relationships. Estimates for the degree of victimization vary. However, Dr. Donna Shalala, former Secretary of the Department of Health and Human Services, quantified IPV by saying that it is “as common as birth in this country because it occurs almost 4 million times each year.” As with other forms of family violence, the most common physical injuries of IPV involve the head, neck and mouth. Therefore, dental professionals should be vigilant in recognizing orofacial signs of IPV in their patients. Physical clues such as trauma in the head and neck region, multiple or old injuries, and untreated rampant caries may be detected during a dental examination. Behavioral clues, such as evasive and vague complaints, explanation inconsistent with injuries, and an overly protective and controlling partner, may be detected in the office environment and during review of the health history. A history of lack of follow through for care, 26

delay in seeking care or repeat visits may also be indicative of IPV.

Dental offices should practice routine assessment for IPV, to the extent not limited by state law. Routine assessment includes asking questions as appropriate of women who exhibit physical or behavioral clues of IPV and documenting the discussion in the patient record. One way to open the dialogue with patients is “Because domestic violence is so common in many people’s lives, I’ve begun to ask my patients about it.” Specific follow-up questions might include: Are you in a relationship with a person who physically hurts or threatens you? Did someone cause these injuries? Who? Questions should be asked in private and patient confidentiality maintained, to avoid putting the woman at even higher risk for serious injury or death.

If this assessment process leads the dentist to have concerns about the patient’s health and safety, the dentist should provide appropriate information, support and encouragement, in accordance with state law. The office can have available information on local resources such as shelters and safe houses. Posters, brochures or “shoe cards” can also be placed in the women’s restroom. “Shoe cards” are small business cards with resource information, the cards being small enough to hide in a woman’s shoe.

The National Domestic Violence Hotline (24 hours, 1-800-799-SAFE (7233); 1-800-787-3224 (TTY) links individuals to help in their area using a nationwide database that includes detailed information on domestic violence shelters, other emergency shelters, legal advocacy and assistance programs, and social service programs. The Web site is: www.ndvh.org.

A few states have mandatory reporting laws for survivors of IPV, women and men alike. Mandatory reporting of adult survivors may remove patient confidentiality, affect informed consent and place the survivor at increased risk. Dentists should be knowledgeable about pertinent state laws on reporting IPV to make informed decisions on the most appropriate intervention. 27 28

III. TABLES

TABLE 1.

FDA CLASSIFICATION SYSTEM

The following table represents the five-category system used by the FDA to classify drugs based on their potential for causing birth defects.

A. Controlled studies in women fail to demonstrate a risk to the fetus in the first trimester (and there is no evidence of a risk in later trimesters), and the possibility of fetal harm appears remote.

B. Either animal-reproduction studies have not demonstrated a fetal risk but there are no controlled studies in pregnant women or animal-reproduction studies have shown an adverse effect (other than a decrease in fertility) that was not confirmed in controlled studies in women in the first trimester (and there is no evidence of a risk in later trimesters).

C. Either studies in animals have revealed adverse effects on the fetus (teratogenic or embryocidal, or other) and there are no controlled studies in women or studies in women and animals are not available. Drugs should be given only if the potential benefit justifies the potential risk to the fetus.

D. There is positive evidence of human fetal risk, but the benefits from use in pregnant women may be acceptable despite the risk (e.g., if the drug is needed in a life-threatening situation or for a serious disease for which safer drugs cannot be used or are ineffective).

X. Studies in animals or human beings have demonstrated fetal abnormalities, or there is evidence of fetal risk based on human experience, or both, and the risk of the use of the drug in pregnant women clearly outweighs any possible benefit. The drug is contraindicated in women who are or may become pregnant.

TABLE 2. DENTAL DRUG ADMINISTRATION DURING PREGNANCY

DRUG	FDA CATEGORY (prescription drug)	DURING PREGNANCY	DURING BREASTFEEDING
Local anesthetics*			
Lidocaine	B	Yes	Yes
Mepivacaine	C	Use with caution; consult physician	Yes
Prilocaine	B	Yes	Yes
Bupivacaine	C	Use with caution; consult physician	Yes
Etidocaine	B	Yes	Yes
Procaine	C	Use with caution; consult physician	Yes
Analgesics			
Aspirin	C/D 3rd trimester	Caution; avoid in 3rd trimester	Avoid
Acetaminophen	B	Yes	Yes
Ibuprofen	B/D 3rd trimester	Caution; avoid in 3rd trimester	Yes
Codeine **	C	Use with caution; consult physician	Yes
Hydrocodone **	B	Use with caution; consult physician	No data
Oxycodone **	B	Use with caution; consult physician	Yes
Propoxyphene	C	Use with caution; consult physician	Yes

*** can use vasoconstrictors if necessary**
**** avoid prolonged use**

TABLE 2. DENTAL DRUG ADMINISTRATION DURING PREGNANCY
(continued)

DRUG	FDA CATEGORY (prescription drug)	DURING PREGNANCY	DURING BREASTFEEDING
Antibiotics			
Penicillins	B	Yes	Yes
Erythromycin	B	Yes; avoid estolate form	Yes
Clindamycin	B	Yes	Yes
Cephalosporins	B	Yes	Yes
Tetracycline	D	Avoid	Avoid
Metronidazole	B	Avoid; controversial	Avoid
Sedative-hypnotics			
Benzodiazepines	D	Avoid	Avoid
Barbiturates	D	Avoid	Avoid
Nitrous oxide	Not assigned	Avoid in 1st trimester; otherwise, use with caution; consult physician	Yes

Table 3. CAUSES AND MANAGEMENT OF BURNING MOUTH SYNDROME

Condition	Pattern	Management
Mucosal disease (lichen planus, oral candidiasis)	Variable pattern oral pain, sensitivity when eating	Identify cause and treat mucosa condition
Menopause	Onset associated with menopausal symptoms	Hormone replacement therapy (if indicated)
Nutritional deficiency (B_1, B_2 or B_6 vitamins)	More than one site affected; also mucosal changes	Oral supplements
Dry mouth (altered salivary content)	Alteration of taste; sensitivity with eating	High fluid intake; sialogogue
Cranial nerve injury	Altered pattern	Central pain control (tricyclic antidepressant)
Medication effect	Onset related to time of prescription	If possible, change prescription

Modified from: Grushka M, Epstein JB, Gorsky M. Burning mouth syndrome. Am Fam Physician 2002;65:615-20.

Table 4. MEDICAL MANAGEMENT OF BURNING MOUTH SYNDROME

Medications	Examples of agents	Dosage	Common Prescription
Tricyclic Antidepressants	Amitryptyline (Elavil®)	10-150 mg/day	10 mg at bedtime; increase dosage by 10 mg. every 4-7 days until oral burning is relieved or side effects occur
Benzodiazepines	Clonazepine (Klonopin®)	0.25-2 mg/day	0.25 mg at bedtime, increase dosage by 0.25 mg every 4-7 days until oral burning relieved or side effects occur
	Chlordiazepoxide (Librium®)	10-30 mg/day	5 mg at bedtime; increase dosage by 5 mg every 4-7 days until oral burning relieved or side effects occur; as medication dose increases, medications is taken in 3 divided doses.
Anticonvulsants	Gabapentin (Neurontin®)	300-1600 mg/day	100 mg. at bedtime; increase dosage by 100 mg every 4-7 days until oral burning is relieved or side effects occur; as dosage increases, medication is taken in 3 divided doses.

Modified from: Grushka M, Epstein JB, Gorsky M. Burning mouth syndrome. Am Fam Physician 2002;65:615-20.

Table 5. SIGNS AND SYMPTOMS OF THYROID DISEASE

Hypothyroidism	Hyperthyroidism
Brittle nails	Diplopia, proptosis and bilateral exopthalmos
Cold intolerance	Fine hair
Constipation	Goiter (enlarged thyroid)
Depression	Heat intolerance
Difficulty swallowing	Increased appetite
Dry, coarse skin and hair	Irregular menstrual periods
Fatigue and lethargy	Irritability, nervousness
Forgetfulness	Muscle weakness or tremors
Goiter (enlarged thyroid)	Palpitations and tachycardia
Hair loss	Persistent perspiration, warm skin
Hypotension	Sleep disturbances
Mood swings	Vision problems or eye irritation
Paresthesias and seizures	Warm skin
Weight gain	Weight loss

IV. APPENDICES

Appendix 1. Key Questions for Women's Oral Health

To ask the woman

Re: pregnancy:
Are you currently pregnant or breastfeeding?
What trimester are you in? (how many weeks pregnant are you?)
Do you experience morning sickness?

Re: young adulthood:
Are you taking birth control pills or using other contraceptive medications?
Have you ever taken the appetite suppressant phentermine and fenfluramine (Phen-fen)?
Do you have any difficulty eating or maintaining weight?

Re: older women:
Are you on hormone replacement therapy?

Re: general questions:
Has your thyroid gland function been checked by your physician? Are you on thyroid replacements? (Synthroid)
Have you ever been, hit, kicked, punched, hurt or frightened by somebody important to you?
How are things at home? Is it safe to go home?

To ask the physician (MD/DO)

Re: pregnancy

Please verify the trimester of the woman's pregnancy. Is the pregnancy a result of fertility drugs? Is the woman's pregnancy high-risk and are complications anticipated? Is there a history of prior spontaneous abortion (miscarriage)? Are there recommendations for the avoidance of specific drugs?

If the woman is undergoing fertility treatment, are there recommendations for the avoidance of specific drugs?

Is a lactation consultant used? What medications will the consultant allow the woman to take during breastfeeding?

Appendix 2.

ADA Statement on HHS Warning to Former Phen-Fen Users

The U.S. Department of Health and Human Services is now recommending that the estimated 4.6 million people who were taking the appetite suppressant drugs fen-phen (fenfluramine and phentermine) or dexfenfluramine or fenfluramine alone receive a complete physical examination and echocardiogram to determine whether they have any adverse heart conditions.

Dentists who have patients who were on these medications should refer them to their physician for the recommended evaluation and treatment before conducting any dental procedure that may cause significant bleeding. Based on what the evaluation reveals, the dentist may then provide necessary dental treatment in accordance with the revised 1997 guidelines titled: "Prevention of Bacterial Endocarditis: Recommendations by the American Heart Association and a Statement for the Dental Profession." These guidelines were approved by the ADA's Council on Scientific Affairs and published in the August 1997 Journal of the American Dental Association.

Under these guidelines, the dentist may prescribe a single pre-procedure dose of antibiotics for appropriate patients who are undergoing procedures that put them at risk for significant bleeding. In addition to patients who have been on these anorectic drugs, dentists may also prescribe antibiotic treatment to patients with cardiac conditions associated with endocarditis, including patients with prosthetic cardiac valves, patients with certain congenital heart diseases and patients with prolapsing and leaking mitral valves.

Examples of dental procedures that might warrant antibiotic treatment include, but are not limited to, tooth extractions, periodontal (gum) surgery, root canal treatment and the placement of orthodontic bands but not brackets.

Patients who took fen-phen, or have a history of heart conditions, should inform their dentist before undergoing any dental treatment.

November 12, 1997

Appendix 3.

RECOMMENDED CALCIUM INTAKE

ADULT WOMEN	Milligrams per day
Pregnant and lactating	1,200-1,500
25-49 years (premenopausal)	1,000
50-64 years (postmenopausal) taking estrogen	1,000
50-64 years (postmenopausal) not taking estrogen	1,500
65+ years	1,500

Source: National Institutes of Health Consensus Panel, Optimal Calcium Intake, 1994

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