

# JOURNAL

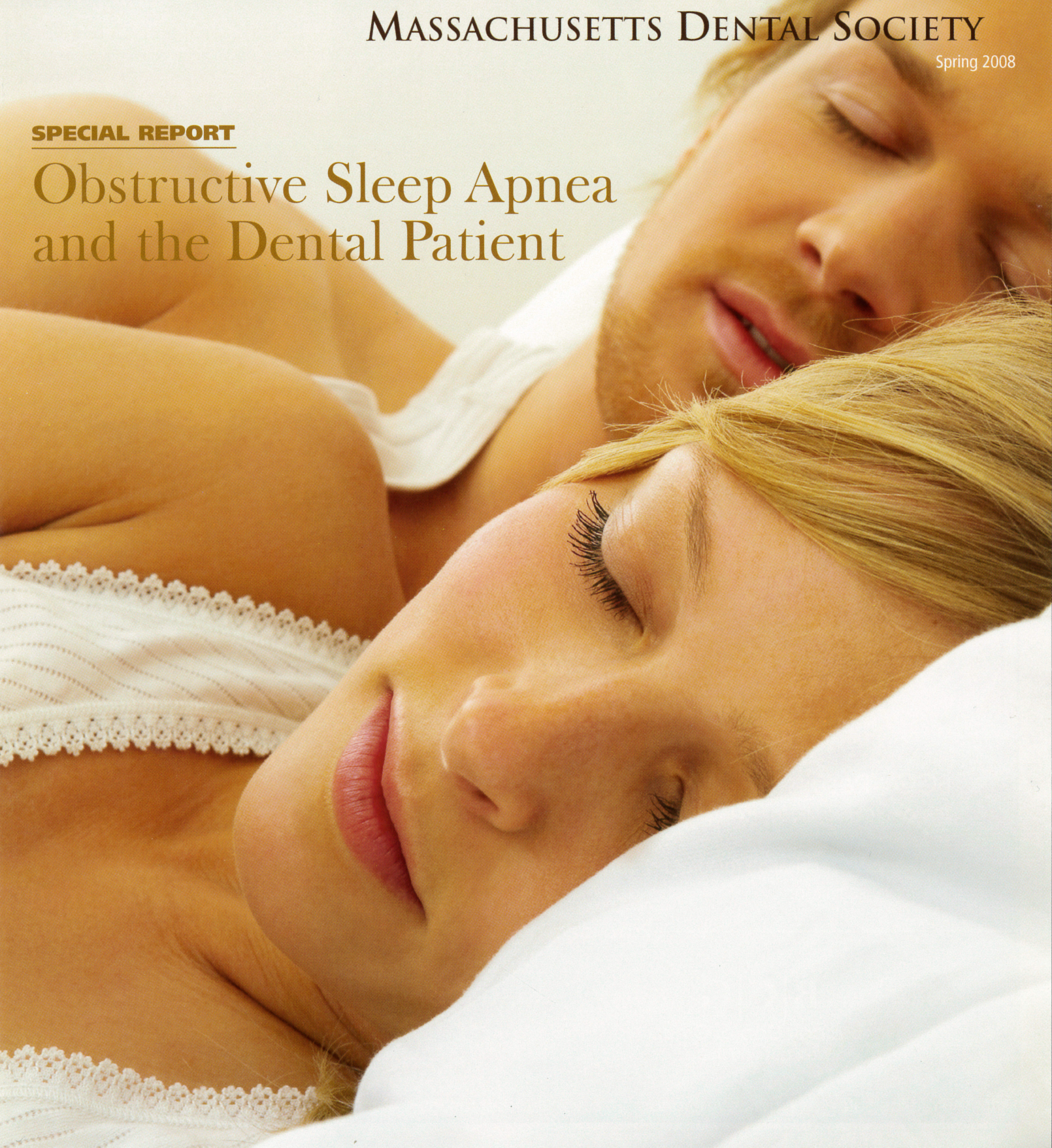
*of the*

MASSACHUSETTS DENTAL SOCIETY

Spring 2008

**SPECIAL REPORT**

## Obstructive Sleep Apnea and the Dental Patient



## YOU CAN'T STOP CHANGE

**W**E WRITE THIS EDITORIAL IN THE AFTERGLOW OF YANKEE DENTAL CONGRESS 33. Never has our landmark perennial convention undergone so much change at one time. Most obviously, we moved to a new venue. The Boston Convention & Exhibition Center (BCEC) was designed to host conventions. The Hynes Convention Center evolved over decades, pretty much along the same timeline as the birth and growth of YDC.

Yankee moved to the BCEC because the Massachusetts Convention Center Authority, which oversees both the BCEC and the Hynes, stated that their (and our) future was in the Seaport District as the Back Bay complex was going to close. Even though the Hynes is still currently booking functions, we took the Authority at its word and consequently moved YDC to the BCEC.

Over the course of 33 years, Yankee has become a fixture in the schedules of thousands of dental practices. It combines education, collegiality, and commercial exhibits in a unique way. Only time will tell how much the physical and geographical changes affect the character of YDC. It is our fervent hope that the basic philosophy of Yankee—a strong educational meeting partnered with commercial exhibits—does not evolve into a “trade show with courses.”

It is critical for all of us to remember that at the heart of Yankee is a group of dedicated volunteers. The amount of time and energy that all of these people—our colleagues—donate for our mutual good is truly amazing. These same people want to be sure that future Yankees continue to meet the needs and expectations of our membership. Please contact MDS staff and volunteer leadership with your experiences and suggestions. The information will flow to the proper people and contribute to future decisions—and, as needed, changes—regarding the conference.

This year has seen two other changes to the soul of Yankee that we must acknowledge:

- William H. McKenna, DDS, a respected leader of the Society, passed away in spring 2007. Dr. McKenna conceived and nurtured the concept of a regional dental meeting. In 1976, his dream became reality with the first YDC. His imagination and courage changed the existing status quo. We are a better profession because of him, and the world is slightly darker without his smile.
- Michelle Curtin came to the Massachusetts Dental Society and the Yankee Dental Conference in its fourth year. Under her guidance, the thousands of volunteers who created every Yankee over the past three decades were encouraged to innovate and bring to life a unique and fresh symposium each year. Michelle's talents and accomplishments brought Yankee to the high level of respect that we are now enjoying. We will miss her, but she made sure to leave us with a cadre of professionals who are ready to assume her mantle. We wish her well in her retirement.

Change is exciting.

Change is bittersweet.

Change is inevitable. ■



*David B. Becker*

*Arthur I. Schwartz*

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## DO YOU HAVE FINANCIAL STAYING POWER?

SOME LIFE TRANSITIONS, SUCH AS A CAREER CHANGE, ARE planned. Others, such as job loss or divorce, can be sudden and unexpected. One common thread running through all transitions is the insecurity of wondering if you will have enough money to get you through. This concern may be exacerbated by not knowing exactly when the transition will be complete. While the goal of finding a new job (in the case of job loss) or landing a first job in a new field (in the case of career change) is clearly defined, it is the timing of achieving the goal that can cause a great deal of financial anxiety.

One way of dealing with this problem is to determine your financial staying power. This exercise allows you to project how far down the road your financial resources will carry you. While there may always be a certain amount of money worries, by knowing how much time you can buy, you can concentrate on the task of accomplishing your transition goal.

The process begins by examining how much it costs you to live your current lifestyle. To do this you will need to go back over your checkbook and credit card receipts to find out where your money has been going. Don't forget those triple lattes and frequent ATM stops that lighten your wallet on a daily basis.

Once you have a good idea of your average monthly expenses, you can match them against the financial resources you have committed to the transition. This will include: cash on hand; any reliable cash inflows such as a spouse's salary, investment income, or rental income; a severance package or unemployment compensation, if applicable; and any investment assets you can liquidate if a shortfall exists.

After recording the expenses for your current lifestyle, you will want to repeat the exercise based on a modified spending plan. You can modify your current spending level by noting areas where you can cut your budget without seriously impacting your lifestyle.

These changes might include doing some things on a less frequent basis, or seeking less expensive alternatives for some of your current spending habits, such as bringing lunch to work instead of dining out every day.

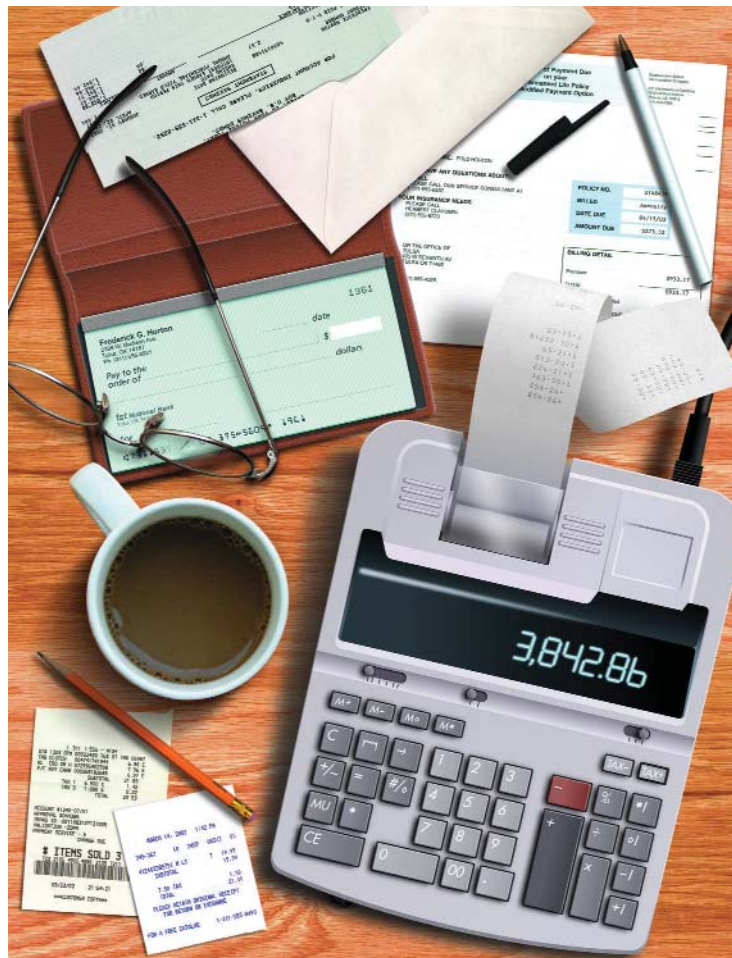
### "Bare Bones" Budget

Now that you have recorded the expenses of your modified spending plan, you are ready to further hone your budget to create your "bare bones" budget. This third level of spending reduces your cash outflows to only those necessary for survival.

At this point in the process, nothing is etched in stone and you are in complete control of how you will allocate your resources. You can even customize your plan to allow for continuing to fund your current lifestyle for a certain number of months, switching to a

modified spending plan if you find that you need more time, or going to your survival budget if an unexpected obstacle prevents you from achieving your transition objective within the planned time frame.

Life changes can be challenging for a number of reasons, but you can ease the financial pressures by knowing at the outset how far your money will carry you. By determining how much it will cost you to get from point A to point B, you can decide whether your transition plan makes financial sense or needs to be redesigned. ■





**GEORGE GONSER, MBA**

*Mr. Gonser is the managing director of MDSIS.*

## FOR HSAs, THE TIME MAY BE/COULD BE/IS NOW

**B**ACK IN THE 1990S, WHEN HEALTH INSURANCE PREMIUMS were increasing at a far more reasonable clip, companies looking to project insurance costs could plug in a single digit and go from there. Fast-forward to 2008 and projecting insurance costs is far more difficult due to the high costs of care and, therefore, insurance.

Based on the renewals in the fourth quarter of 2007 and early 2008, you can start with a renewal cost increase of 15 percent. Is there anything that can be done to reduce costs? That's what we hope to answer here. Many of the same cost-saving ideas that have been promoted—such as increasing co-pays, implementing deductibles, and introducing higher cost procedure co-sharing—are outlined below. In addition, switching carriers is discussed, but that has not been as successful over the past few years as health insurance companies have scaled back initiatives to differentiate themselves in this volatile market. Aside from census changes and other creative solutions gleaned from the existing office staff, what can be done to reduce costs?

The insurance industry is putting its efforts behind the promotion of health savings accounts (HSAs). HSA is not a new term; it is a continuation, refinement, and expansion of the old Archer Medical Savings Accounts. In a nutshell, HSAs are qualified high-deductible health plans with a pretax vehicle to subsidize the deductible. So what are some of the components—and myths—about HSAs?

**HSAs are tax-free medical savings accounts.** HSAs are essentially dedicated medical 401(k) plans that help pay for medical expenses. Employees with less than 2 percent corporate ownership or no ownership can contribute on a pretax basis to their qualified HSA plan. For those with 2 percent or greater ownership in a company, the contributions are tax-deductible. The beauty of an HSA plan (unlike a flexible spending account) is that the unused balance in the HSA account carries over on a year-to-year basis and, if there are enough funds in the account to qualify, can be invested and grow over time. Monies utilized from the HSA can be used to offset qualified medical expenses without incurring tax consequences.

**Qualified high-deductible plans are needed to implement an HSA.** Many people ask if their deductible-based health insurance plan will qualify for an HSA. The high-deductible plan has to be a qualified plan, and most insurance carriers designate which plans qualify. Two key components for a qualified high-deductible plan are that the annual deductible has to be at least \$1,100 for individuals and \$2,200 for families, and that all

expenses have to meet the deductible before the traditional plan kicks in. The contribution maximum for 2008 allows for up to \$2,900 for individuals and \$5,800 for families, so there is ample room to contribute in excess of your deductible if you so desire.

**Who makes the contributions?** The short answer is employers only, employees only, or a combination of the two. Many businesses switching to HSA plans have provided monies for employees into their HSA account as “seed monies.” The change from a co-pay-based health maintenance organization (HMO) plan to an HSA plan involves much transition. Therefore, depending on the premium savings of an HSA versus a traditional health plan, there could be a contribution made by the business. However,

it is on a case-by-case basis and entirely up to the business. Finally, there are catch-up provisions for those over the age of 55, allowing up to \$900 beyond the contribution maximum up to age 65.

**What can the money in the HSA plan be used for?** There is a complete list of qualified medical expenses (IRS Publication 502) that can be utilized. Much like a 401(k), an HSA plan allows those under age 65 to take money out for non-IRS Publication 502 expenses, but they must pay a penalty of 10 percent as well as tax consequences.

**HSAs are only for the healthy, wealthy, and wise.** Not true. Well, except for the “wise” part. HSAs require education, planning, and a greater understanding of the cost of the care you are receiving. As consumers, we have been blinded by the true cost of care by HMOs, and with the realization that HMOs are not working out as planned, the onus is being placed right back on us. For an HSA plan enrollee, it is essential that you understand cost and quality of care. Since you are paying for much, if not all, of the cost, you'd better understand and be wise about what you are spending. You are in control of your money.

**HSAs are easy to set up.** True and false. Any change is a challenge. Therefore, you must give yourself ample time to implement such a plan in your company. The tools to quote and implement HSA plans are integrated into the top agencies, such as MDS Insurance Services, Inc. You should weigh the savings versus the education-and-change factor in your business. Speak to your agent to get as much information as possible on the topic.

Not all HSA plans are created equal. Get the proper advice and analysis to make an informed decision. HSA plans, just a fad a few years ago, are making large strides in Massachusetts. They may be right for you. ■





**MARK ABRAMS**

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# YOUR PRACTICE—MARKETING ON THE INTERNET

**Y**OUR PRACTICE'S WEB SITE AND A SMILE HAVE A LOT IN COMMON. In a few seconds, they convey a first and lasting impression of who you are. A well-designed dental Web site will look good, be intuitive, and communicate your practice's services and atmosphere. You can create a Web user experience that will serve you well.

## Getting Your Message Across

A pleasing presentation is a tempting invitation for your Web site visitors to learn more. The right combination of visual images and words will get your message across effectively and with impact. Statistics and user interface studies show that few Web viewers read the bulk of what is written; most people prefer to scan or chunk select blocks of information. Words are important, but when it comes to the Internet, less is more. On the Web, graphics play a larger role than in traditional media, and graphics are the signposts that help guide the reader. A well-designed Web site will personalize your practice, specialty, and yourself to your prospective patients. Your Web site should easily communicate what you offer. You can save a few dollars with prepackaged Web templates or listing services, but they limit your ability to distinguish yourself from every other dentist. Your Web site can be a very powerful marketing tool.

## Building Your Site

Before you begin creating or redesigning your Web site, there is a seven-step process that will help you build a site that works and that will assist you in understanding what a professional Web developer should be doing for you.

1. **Discovery**—Conducting a business analysis and customer analysis to provide a clear understanding of patient demographics and services needed to help you build your practice and direct advertising resources.
2. **Exploration**—Defining the structure of the Web site and the site's navigation so that it presents your practice's services fluidly to your prospective patients.
3. **Refinement**—Determining the look and feel of the site through sketches or computer mock-ups, selecting image sizes, layouts, and multimedia treatments, including computer animation and/or Web video, as well as a visually effective color palette.
4. **Production**—Bringing the design concepts together into high-fidelity prototypes where you provide written content for each page (or this task can be assigned to a copywriter).
5. **Implementation**—Building your Web site, where graphics are enhanced, code is created, and each page is tested for quality and user-friendliness.
6. **Launch**—Debuting the live deployment of the Web site,

including confirming that all grammar and spelling is correct and checking all hyperlinks to ensure that references to internal and external pages function as expected on the live site.

7. **Maintenance**—Overseeing the ongoing process of content updates, usability, and satisfaction metrics; site analytics for marketing; and search engine optimization. Site analytics are accomplished through analysis of the actual Web usage statistics, and other metrics are accomplished via surveys.

## Being Found on the Internet

The best-designed Web site will do little good if people can't find it. On the Internet, search engines are the tools by which the majority of people find what they are looking for. Getting your site to the top of Google, Yahoo, and MSN is very important for your Web success. Search engine optimization falls into two models: organic search engine optimization (SEO) and pay-per-click (PPC) marketing.

SEO is the strategic use of keywords within the Web page to increase its rank on the search engine's results page. Each search engine's algorithms are different and they are constantly changing. Achieving and maintaining a high page rank is like being in a horse race. Your actions, as well as your competitors' actions, will determine your position.

PPC allows you to buy an advertising spot for your Web page. The price you are willing to pay for a prospect clicking on a link to visit your site is the determining factor as to where your page will rank in the pay-per-click lineup. As of late 2007, costs were running anywhere from 5 cents to more than \$5 per click. Third-party programs can range from \$500 to \$1,500 per month to achieve a page-one position.

My own statistics derived from Google for high-ranking dental sites show that 50 to 70 percent of visits are the results of search engines, and 20 to 38 percent of visits are accessed directly via the Web site's URL.

## Marketing Dynamics

Traditional marketing—dubbed interruption marketing—is where you attempt to get your ad in front of viewers and hope they respond. Your ad may be broadcast by television, radio, newspaper, or direct marketing. Search engine marketing is very different. The prospect actively seeks out the provider using Internet search technologies. If your Web page is consistent with what the prospect is looking for, your probability of success is significantly improved.

A well-designed Web site that is easy to find can be one of the best investments you make in your dental practice. No other media offers so much for so little cost. Help those looking for your services to find you, and your practice will prosper. ■

# Yankee Dental Congress® 33

## JUST IMAGINE...

... more than 29,000 dental professionals descending with excitement and awe upon the Boston Convention & Exhibition Center (BCEC) from January 29 through February 3, 2008. No matter where Yankee Dental Congress takes place, it always provides a second-to-none educational program. With more than 500 exhibits, top-tier entertainment, and over-the-top events, YDC is the place to network and learn with thousands of your peers.

"As president, I had a tremendous feeling of pride as I attended the events at Yankee Dental Congress 33," says Massachusetts Dental Society President Dr. Andrea Richman, summarizing her feelings on YDC 33. "There was such a sense of excitement in the air. The meeting was so professionally executed by our staff and Core Committee that one would never imagine that this was our first meeting at the BCEC."

Yankee Dental Congress 33 kicked off on Thursday, January 31, as hoards of attendees crowded into the ballroom for YDC First Night. Acrobats from Cirque Productions wowed the adults and children alike. The MDS Foundation Casino Night was more successful than ever. Red Sox legend Jim Rice was on hand to help raise money for the MDS Foundation by signing autographs and posing for pictures. Fabulous prizes were raffled away every 20 minutes, keeping the energetic crowd rapt with attention, awaiting their name to be read. Long lines flanked every bar in the ballroom. Everyone wanted to celebrate Yankee's new home and a new era for the meeting.

As for the educational offerings that YDC is renowned for, headliners were rampant on the program—Frank Spear, Tony Sclar, Connie Podesta, Barbara Steinberg, John Molinari, Jennifer de St. Georges, and that's just a start. A medical-dental forum focusing on cardiology, endocrinology, and the perio-systemic link was a first of its kind at YDC and brought medical professionals together with dental professionals. Other highlights of the Scientific Program included the return of the YDC-cosponsored Specialty Symposia for a fifth year, including programs for endodontists, orthodontists, pediatric dentists, periodontists, and oral and maxillofacial surgeons. The Las Vegas Institute of Advanced Dental Studies, one of the most renowned educational institutions for dental education, offered both lectures and hands-on courses for attendees.

*"There is no question that Yankee will continue to get better each year."*  
—Dr. David Samuels,  
YDC 33 General Chair

Celebrity entertainment was greater than one could ever have dreamed. Mystery author Harlan Coben, actress Geena Davis, and party planner extraordinaire Brian Rafanelli feted their listeners with anecdotes and tips. Nine-time Grammy Award-winning singer-songwriter Sheryl Crow rocked the house on Friday night in the BCEC Ballroom as her fans crowded the front of the stage.

Yankee's exhibit floor—the largest to date—was filled with hundreds of vendors showcasing the latest in dental technology. Thousands of attendees took advantage of show specials and walked away with state-of-the-art products at terrific prices. The exhibit floor provided something for everyone with music, dancers, jugglers, celebrities, food, drink, and plenty of exhibitors to meet all of your needs.

Initially, the new center provided challenges. Where is registration? Where is the CE Pavilion? Where is my class? Where am I? But with a little bit of adjustment and a little time to get acclimated to the new venue, everyone found that moving YDC to the BCEC made perfect sense, and now Yankee has a new, bigger home that can grow with us.

"So many people have worked extremely hard over the past three years to make this move a successful one," says YDC 33 General Chair Dr. David Samuels, celebrating the success of the conference and looking to the future. "There is no question that Yankee will continue to get better each year. We now have a new template to work with. As the Seaport area develops, new restaurants and retail shopping will give everyone what they want at the finest dental meeting in the country." ■



Journal of the Massachusetts Dental Society



## JUST IMAGINE... YDC 33





# Obstructive Sleep Apnea: Don't Be Asleep at the Chair

**B. GAIL DEMKO, DMD**

*Dr. Demko is an expert advisor on sleep apnea to the Food and Drug Administration. She maintains a private practice in Auburndale.*

**H**ave you ever had a patient fall asleep in the dental chair? Did you assume that the patient was so relaxed while in your care that he or she could fall asleep even as dental work proceeded? What may have happened is that the sleeping patient very likely has severe obstructive sleep apnea.

Sleep-disordered breathing (SDB) is a term used to include the entire spectrum of breathing difficulties at night, not just the more severe manifestations such as obstructive sleep apnea (OSA). OSA is a disease best viewed as a hydra, a mythological beast with many heads, because it impacts coronary artery disease, hypertension, heart failure,<sup>1</sup> obesity, insulin resistance, erectile function, glaucoma, stroke, attention-deficit/hyperactivity disorder, failure to thrive, quality of life,<sup>2</sup> and neurocognitive impairments. It affects people of all ages, from newborns to the elderly.

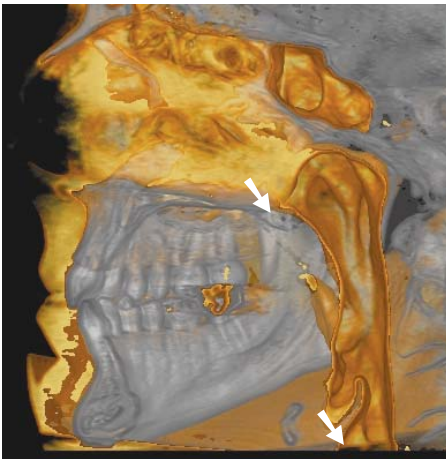
So why discuss sleep-disordered breathing with dentists? Because SDB affects more than 10 percent of the adult patient population, dentists and their staff are in a good position to help identify patients at high risk for SDB and direct them so they are appropriately diagnosed. And with oral appliance therapy, a dentist is able to return more than 43 to 56 percent of those patients to normal breathing at night.<sup>3</sup> SDB is an epidemic with far-reaching consequences, and dentists stand hand-in-hand with physicians in the ability to restore these patients to normal function with an improved quality of life.

The official definition of obstructive sleep apnea is a disorder “characterized by recurrent episodes of partial or complete upper airway obstruction during sleep despite ongoing inspiratory efforts. The lack of adequate alveolar ventilation usually results in oxygen desaturation, and in cases of prolonged events, a gradual increase in PaCO<sub>2</sub>. These events are often terminated

by arousals.”<sup>4</sup> What this means is that the tube through which one breathes can be smaller or unusually collapsible, which will limit the amount of air that gets into one’s lungs at night. So, even if the patient is trying to breathe, the decrease in air flow can result in a drop in the amount of oxygen in the arterial blood and allow a buildup of carbon dioxide. The body responds to this assault by “waking” the patient slightly and interfering with restful sleep.

So where is the upper airway? This can be viewed in both two-dimensional and three-dimensional renditions. (See Figures 1–3.) The upper airway extends from the distal aspect of the posterior nasal spine to the thyroid cartilage. In adult men, the upper airway is approximately 5 inches long; in adult women, it is approximately 4 inches long.

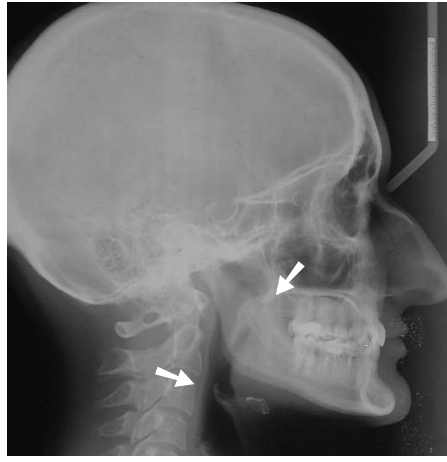
Why would a structure as important to life as an airway have the ability to collapse during a process as important as respiration? Human beings are the only species to use the upper airway for three separate functions—respiration, deglutition, and phonation. The upper airway must be as rigid as possible to maintain airway patency during respiration. It must also be extremely flexible to allow deglutition; it must completely close in order to start the peristaltic action necessary to move a food bolus into the esophagus. And in order for a person to speak, the upper airway changes length and shape to alter the sounds generated in the larynx, acting in a manner similar to the slide on a trombone. It must be remembered that of the more than 20 muscles that make up the upper airway, not one of them has the primary function of pharyngeal dilation.<sup>5</sup> These upper airway muscles are enclosed in a fairly rigid box that consists of the maxilla, the mandible, the dentition, and the cervical spine. An imbalance between the size of the rigid box and the size of the soft tissue inside that box will have a significant impact on the luminal size of the upper airway.



**Figure 1. Location of the collapsible upper airway, CT 3-D view. (Image courtesy of Malden Dental Radiology.)**

The narrowing of the upper airway can result in varying degrees of diminished airflow. The most severe breathing event would be an apnea, at which point there is effectively no airflow. With a hypopnea, there is a decrease of 30–50 percent in airflow and either a drop in the blood oxygen saturation or an arousal, meaning a shift out of stable sleep. In some instances, the airway is narrow but the diaphragm, by dint of significant muscular effort, can overcome this restricted lumen size and maintain normal oxygen levels in the blood. The increased muscular effort by the diaphragm will cause an arousal, interrupt the normal pattern of sleep, and negatively impact the patient's overall sleep quality. This minor sleep-disordered breathing event is called a respiratory effort related arousal (RERA). The lowest level of sleep-disordered breathing is snoring. When the airway narrows enough to cause turbulence of airflow, the nonlaminar movement of air will cause vibration of any loose tissue in the upper airway (e.g., uvula, edge of soft palate, laryngeal folds, polyps, etc.). The resulting sound is snoring.

So where does the upper airway collapse? Almost anywhere along its entire length.<sup>6</sup> Research shows that there can be side-to-side collapse<sup>7</sup> or front-to-back collapse anywhere in the 4- to 5-inch collapsible upper airway.<sup>8</sup> It is most common for patients to have obstructions in the upper one-third and least common to have closure in the lower one-third of the collapsible upper airway. Unless a catheter with pressure receptors is placed in the upper airway or the patient sleeps inside a computerized tomography (CT)



**Figure 2. Cephalometric 2-D view of the upper airway.**

machine, there is no way to clinically determine where an individual patient is obstructing. The narrowing can be relatively localized or there can be complete closure of the entire collapsible airway. The location and severity of upper airway obstruction in an individual varies from night to night and is impacted by alcohol consumption, lack of sleep, neck position, jaw opening, nasal congestion, and sleep position.<sup>9</sup> (See Figures 4 and 5.)

So why does the upper airway collapse? It may collapse because negative airway pressure created during breathing will close the soft palate and the tongue against the posterior pharyngeal wall<sup>10</sup> or because gravity pulls the relaxed muscles of the tongue and soft palate back against the pharyngeal wall when the patient sleeps on his or her back. There can be anatomic factors that predispose to airway collapse or insufficient neuromuscular compensation to maintain patency of the upper airway.<sup>11</sup> Decreased neural output to the diaphragm can play a role in OSA, or result in an entirely separate disorder called central sleep apnea.

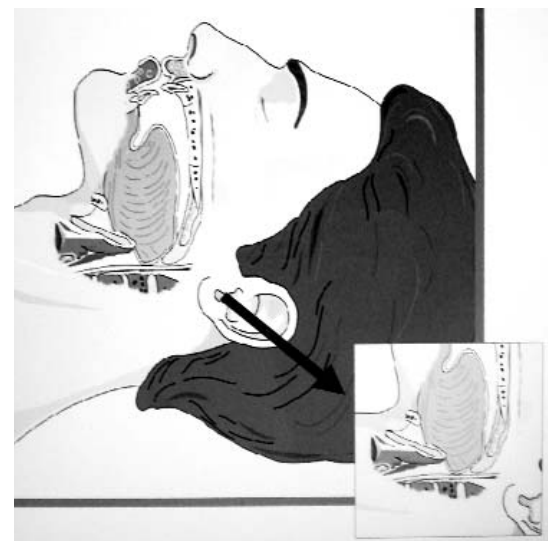
Who develops sleep apnea? Anybody. It can occur in newborns, young children, teens, and adults. Large demographic studies have shown that the prevalence of OSA varies depending on neck circumference, body mass index, gender, ethnicity, pregnancy, and age.<sup>12</sup> Large studies have shown that as many as 20 percent of the population over the age of 60 have OSA. Original data from Terry Young's Wisconsin Study in 1993 looked at more than 700 state employees and determined



**Figure 3. 3-D (CT) cross section of the upper airway. (Image courtesy of Systemic Technologies LLC.)**

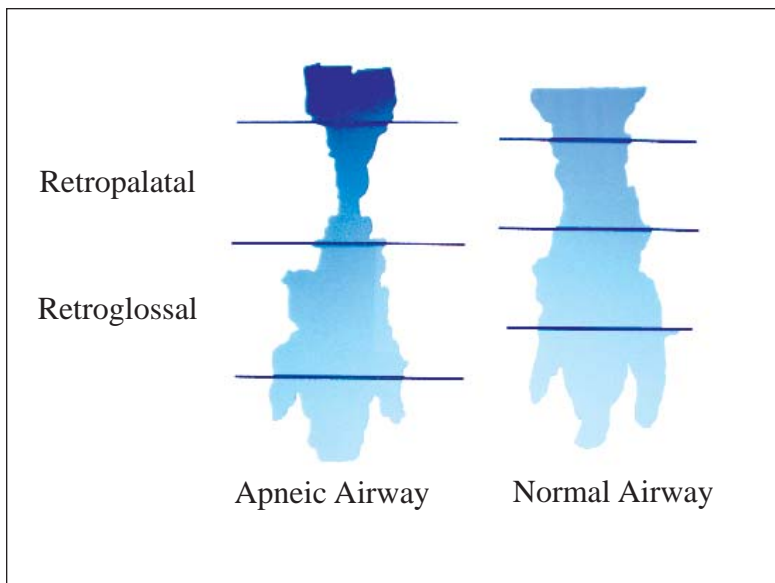
that 2 percent of all middle-aged working women and 4 percent of men had diagnosable obstructive sleep apnea syndrome (OSAS)<sup>13</sup> where the patient has breathing events and symptoms.

Certain groups are at very high risk for OSA: 50 percent of Down syndrome patients, 50 percent of patients with pacemakers, 66 percent of women with polycystic ovary disease syndrome (PCOS),<sup>14</sup> 50 percent of children requiring rapid palatal expansion for posterior crossbites,<sup>15</sup> and high numbers of patients with cleft palate repairs have diagnosable OSA. It must be noted that while many people with OSA snore, 13 percent of women and 3 percent of men with OSA report that they do not snore.<sup>16</sup> Some people with severe OSA may deny symptoms of excessive daytime sleepiness (EDS), while many with minimal OSA or



**Figure 4. Diagram of an occluded airway. (Image courtesy of the American Academy of Dental Sleep Medicine.)**





**Figure 5. Size of apneic upper airway versus normal upper airway. Reconstruction is from 3-D data. Based on 3-D CT scan data collected by Richard Schwab, MD.**



**Figure 6. Wiring a patient for polysomnographic study. (Image courtesy of the American Academy of Dental Sleep Medicine.)**

one of the other sleep disorders are so affected by EDS that they routinely fall asleep while driving or at work. With more modern diagnostic equipment and increasing obesity around the world, the number of people diagnosed with OSA continues to rise.

So what is the personal and societal cost of obstructive sleep apnea in the population? Obstructive sleep apnea is associated with medical conditions that are known to be the leading causes of death in adults: hypertension and cardiovascular and cerebrovascular diseases. The cardiovascular system is affected all the way from the increased cardiac effort necessary to pump against negative thoracic pressure down to the impact at the level of the blood vessel walls with chemical and cellular changes that increase atherosclerosis. Recent studies have shown a correlation between severe obstructive sleep apnea and metabolic syndrome.<sup>17</sup> Nocturnal elevations in blood pressure increase the chance of a cerebrovascular accident. Many men with OSA suffer a negative impact on sexual performance and pregnant women with OSA are more likely to have pregnancy-induced hypertension. Sleep-disordered breathing has also been linked to attention deficit disorder and attention-deficit/hyperactivity disorder. Studies as far back as 1988 have shown an increased death rate in patients with severe obstructive sleep apnea.<sup>18</sup>

But there are more subtle associations with OSA; the excessive daytime

sleepiness impacts cognitive function, maintenance of personal relationships, health-related quality of life, and a seven-fold increase in motor vehicle crashes and occupational accidents.<sup>19</sup> Not only does OSA cost billions of dollars per year in direct medical costs,<sup>20</sup> but there is also a huge burden resulting in lost time at work, poor decision making, and industrial accidents. OSA is a disease that is potentially life threatening; it has a negative impact on a person's ability to work and to enjoy his or her life.

### Diagnosis of OSA

The diagnosis of the disease lies within the purview of medicine. For more than 20 years, dental researchers tried to determine if patients with obstructive sleep apnea could be diagnosed with the use of lateral cephalometric radiographs, clinical head-and-neck evaluations, and questionnaires about sleeping habits and problems. Though there are many correlated findings between obstructive sleep apnea and head-and-neck abnormalities, clinical and radiologic/scanning data only point to possible candidates and completely miss others. With more than 82 sleep disorders identified, many of which occur simultaneously, diagnosis of obstructive sleep apnea can only be accomplished with nocturnal polysomnography (PSG). (See Figure 6.)

Polysomnography requires the patient to go to an established sleep laboratory and have many sleep variables recorded. Electrodes are used to obtain data on

breathing, EEG patterns, muscle activity, airflow, arterial oxygen saturation, body position, snoring sounds, and cardiac parameters. There are even standard guidelines for diagnosis of nocturnal bruxism and clenching. Scoring will determine the number of breathing events that the patient has averaged over the hours of sleep recorded; this is known as the apnea-hypopnea index (AHI). Taking all the information gathered, the physician determines the severity of disease and makes the decision as to how the patient will be treated.

Therapies for OSA include continuous positive airway pressure (CPAP);<sup>21</sup> oral device therapy, most often with a mandibular repositioning device (MRD); and multiple surgical approaches.<sup>22</sup> The American Academy of Sleep Medicine guidelines state: "Although not as efficacious as CPAP, oral appliances are indicated for use in patients with mild to moderate OSA who prefer OAs to CPAP, or who do not respond to CPAP, or who fail treatment attempts with CPAP or treatment with behavioral measures such as weight loss or sleep-position change."<sup>23</sup>

Since dentists can work hand in hand with physicians and patients to improve the quality of care and overall health status of patients, and return almost half of afflicted patients to normal breathing, it behooves all dentists to have a working knowledge of obstructive sleep apnea and the various treatment options available. ■

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# Screening for Obstructive Sleep Apnea in the Dental Office Setting

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**O**bststructive sleep apnea (OSA) is a widespread disease with a prevalence of 4 to 9 percent in the world's population.<sup>1</sup> It occurs in all age groups from neonates to senior citizens, but weight, age, race<sup>2,3</sup> and gender<sup>4,5</sup> all influence its expression. OSA is as common as asthma and in its severe form can cause fatal cardiovascular damage.<sup>6,7</sup> Since a dental practice often treats entire families on a routine basis, the setting is a natural place to aid in identifying patients at risk for having OSA.

Humans are the only animals who get OSA because the human airway is multifunctional: it carries air, it moves food, and it allows for speech. Our pharynx must be open to allow the diaphragm to move air, it must completely close to start the peristaltic action of swallowing, and it must do both of these actions like the slide on a trombone to modify the sounds from the vocal cords for speech. The collapsible airway is a 4- to 5-inch-long tube that starts at the posterior nasal spine and ends at the thyroid cartilage. It can collapse during sleep, partially or completely, front to back, side to side, in one spot, or along its entirety. The cause can be structural or functional, which means that while some patients with OSA have an obvious facial deformity, there are many who have absolutely normal facial and intraoral structure. This latter group is more likely to have functional deficits where the control centers in the brain send incorrect messages to the breathing muscles, the nerves transmit the messages inadequately, or the muscles misread the messages sent. Those patients with sleep apnea cannot be identified by physical findings alone.

OSA is erroneously thought to be a disease that affects only overweight middle-aged men; nothing could be further from the truth. Indeed, males are more prone to have sleep apnea from the time they reach puberty, when testosterone increases muscle bulk in all their muscles, even those in the upper airway.<sup>8</sup>

Women have a significant increase in OSA after menopause, when they have lost the protective hormones of estrogen and progesterone. However, it is a disease of all ages and all body types. Children with OSA usually have structural causes, and in the first year of life it is frequently syndromal abnormalities such as Treacher Collins syndrome or Pierre Robin sequence that cause the disease. For children between the ages of 2 and 8 it is commonly adenotonsillar hypertrophy, but more and more, in this well-fed, sedentary world, obesity pushes marginal cases over the edge into frank disease.<sup>9</sup>

Obstructive sleep apnea has a two-pronged attack on the body. Intermittent hypoxia, caused by airway obstruction, activates the autonomic nervous system leading to release of adrenaline and concomitant increase in blood pressure, alteration in heart rate, and vascular changes down to the level of the capillary walls. The cardiovascular system is affected in its entirety. There is also a component of alteration in sleep pattern that can result in daytime sleepiness, unrefreshing sleep, insomnia, and frequent nighttime awakenings. Sleep apnea has been tied to many medical problems, and it aggravates others. Research is beginning to tie OSA to a role in metabolic syndrome<sup>10,11</sup> (trunkal obesity, increase in LDL, decrease in HDL, hypertension, insulin resistance, and gout). Cardiac arrhythmias, drug-resistant glaucoma, gastroesophageal reflux disease (GERD), and preeclampsia in pregnant women may also be exacerbated in those with OSA. This disease has a huge impact on patients and the world around them. There is a sevenfold increase in motor vehicle accidents,<sup>12</sup> costs of time lost from work, and workplace accidents, but it is the quality-of-life issues related to endless fatigue, breakdown in personal relationships, and loss of emotional coping mechanisms that take the largest toll.

Adding some questions to your office health history and noting a few possible anatomic indicators may help you direct your patients to their physician for definitive testing. Both dentists and dental hygienists are in an ideal position to screen for possible sleep apneics. Dental hygienists often engage various family members in discussion and "intraprocedural chatting." This could include a generalized statement made to each

patient, such as “Our dentist has started general screening for patients who might have obstructive sleep apnea. You know, it can be a fatal disease and it is strongly implicated in children with ADD and ADHD.<sup>13</sup> Let me go over the new questions we added for the medical history and see if you or someone in your family may be at risk.” These questions can be as simple as:

- Does anyone in your family snore?
- Do you have children who snore?
- Do you wake up tired?
- Do you or your bed partner gasp or choke during sleep?
- Do you or a family member complain of frequent awakenings at night?
- Do you fall asleep at inappropriate times? At work? At the movies? While watching television after dinner?

### What a Positive Answer Might Mean

*Does anyone in your family snore?* Although 13 percent of women with OSA and 3 percent of men with OSA don’t snore, it is still a common finding. You need to be aware that 40 percent of the adult population snores at least infrequently<sup>14</sup> and this question alone has a low specificity for defining those people with OSA, but coupled with other findings, it will alert them to the possibility that they may be at risk of having OSA.

*Do you have children who snore?* Many children snore when they are overtired or have a cold, but children who snore nightly demonstrate a high chance of having OSA. One study looked at children who were referred for rapid palatal expansion for orthodontic purposes; all of those patients snored and half of them were diagnosed with OSA.<sup>15</sup>

*Do you wake up tired?* There are more than 82 sleep disorders now recognized by the American Academy of Sleep Medicine. Poor sleep hygiene, inadequate sleep time, shift work, restless leg syndrome, and obstructive sleep apnea are only a few of the diseases that prevent a person from feeling rested in the morning.

*Do you or your bed partner gasp or choke during sleep?* These sounds only occur at the termination of a complete airway blockage and are considered

highly indicative of the presence of OSA. Healthy people may have infrequent airway blockage, but it will last for only a short time and will not cause symptoms. One must remember that many severe sleep apneics have only partial blockages; therefore, they exhibit no gasping or choking, only unrelenting snoring.

*Do you or a family member complain of frequent awakenings at night?* Sleep apnea interferes with the body’s need to spend long periods of time in different revitalizing levels of sleep. When the collapsible airway starts to close and starve the body for oxygen, the diaphragm has to overwork to maintain any airflow at all. Increased diaphragmatic action or triggering of the sympathetic nervous system initiated by a drop in arterial oxygen saturation will cause a shift in sleep level toward full wakefulness. Watch for the patient who says, “I can fall asleep okay, but I wake up at two o’clock in the morning and can’t get back to sleep.” Many women with OSA complain of sleep onset insomnia or have been incorrectly diagnosed with depression.

*Do you fall asleep at inappropriate times?* If the patient answers “yes,” this is an indication of a significant sleep debt and may be due to lifestyle, job or family demands, or one of the many sleep disorders. It is not normal to fall asleep during the day if nighttime sleep is adequate.

### Physical Findings

There is great dissension in the literature as to which physical findings can be correlated to OSA. Over the past 20 years, many researchers have done multivariate analyses involving physical characteristics, cephalometric findings, and the severity of sleep apnea; many of the results are conflicting. Some of the more common physical findings would be an erythematous wide uvula in men (see Figure 1), retrognathia in women,<sup>16</sup> lateral border scalloping of the tongue (see Figure 2),<sup>17</sup> a large neck circumference, and forward head position.<sup>18</sup>

Postsurgical findings are important. Patients who thought they had primary snoring may have undergone uvulopalatopharyngoplasty (UPPP) where there was surgical removal of the tonsils, uvula, and the edge of the soft palate (see Figure 3), but this surgery is less than 13 percent successful in the long term<sup>18</sup> and many of these patients may



Figure 1. A wide erythematous uvula.



Figure 2. Significant lateral border scalloping of the tongue related to tongue crowding in the oral cavity.



Figure 3. Post-UPPP surgery throat form.



Figure 4. Effect of nocturnal GERD on the dentition with overclosure of VDO.

be unaware that their OSA has not been effectively treated. Patients with surgical correction of a cleft palate also present a very high risk for obstructive sleep apnea.<sup>19</sup> Other physical findings, such as evidence of acid reflux into the oral cavity (see Figure 4) and four bicuspid extrac-

tion orthodontics with facial flattening (especially if the maxillary anterior contacts are open), should alert the dentist and hygienist to the possible presence of OSA.

A review of your present medical questionnaire may also help identify possible sleep apneics. OSA is found in 50 percent of patients with pacemakers, 50 percent of patients with congestive heart failure,<sup>20</sup> and 50 percent of patients with Down syndrome.<sup>21</sup> Hypertensive patients who require more than two antihypertensive medications to control their blood pressure should undergo testing for obstructive sleep apnea. Acromegalic patients, those with hypothyroidism, post-polio syndrome, myasthenia gravis, multiple sclerosis, and other muscular or neural control syndromes also are at high risk for obstructive sleep apnea. These patients need to be referred to their primary care physician for further evaluation and proper diagnosis.

### Treatment for OSA

Treatment of a collapsed airway is strictly mechanical. The area of collapse can be bypassed with a tracheotomy. The likelihood of airway collapse can be altered by administration of nasal continuous positive airway pressure (nCPAP), an air pump that actually stents open the airway pneumatically. An oral device can change the collapsibility of the airway walls. Permanent alterations to the shape of the airway via hard-tissue surgeries (maxillo-mandibular advancement, or MMA) have a success rate of 75 percent in returning the patient to normal breathing.<sup>22</sup>

Soft-tissue surgeries, including UPPP, pillar implants, and many others, have a very low long-term success rate.<sup>23</sup> Bariatric surgery to help the patient control morbid obesity will frequently solve the problem of OSA, but studies have shown that the disease may return regardless of maintaining a lower weight.<sup>24</sup>

Obstructive sleep apnea worsens with age, weight gain, and use of medications such as muscle relaxants and benzodiazepines. One pilot study showed that 50 percent of patients with both OSA and bruxism had a significant increase in their OSA if given a maxillary single-arch bruxism splint.<sup>25</sup> As the disease progresses with time, all treatments

will require adjustment; even a surgical success today will fail with time and require additional therapy.

### Conclusion

This disease is insidious, it is self-sustaining, and it becomes more severe with time. The dental office presents a perfect first-line site for screening patients who require further medical follow-up. Oral appliance therapy is fraught with side effects and pitfalls, but having an office policy in place and proper follow-up will help minimize the “downside” to dental treatment of OSA. ■


### Editor's Note

See the third and fourth articles in this Special Report on obstructive sleep apnea in the Summer 2008 issue of the JOURNAL OF THE MASSACHUSETTS DENTAL SOCIETY.

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# Patient-Perceived Anxiety Levels Associated with Use of Selective Serotonin and Serotonin Norepinephrine Reuptake Inhibitors

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## Abstract

**D**ental practitioners are sometimes reluctant to treat patients who are on psychopharmacological agents, due perhaps to the belief that these patients will be difficult to deal with. However, patients whose medical history indicates emotional and psychiatric disorders and who are being treated with SSRI or SSNRI agents may actually present a more positive and more receptive attitude to treatment than what was sometimes previously encountered in these same individuals.

## Introduction

It is common knowledge that fear, anxiety, negative attitudes, and certain mental disorders often create barriers to regular oral health care. These obstacles have prevented individuals from seeking care, and have often hindered practitioners from completing necessary treatment. In recent years, numerous studies have investigated the causes of such fear, anxiety, and associated avoidance.<sup>1-3,5,9,10,13</sup> Other studies have attempted to evaluate patient satisfaction/dissatisfaction with treatment as well as dentists' attitudes based on utilization of a variety of clinical questionnaires.<sup>4,6-8</sup> Still others have concentrated on developing various behavioral modalities that attempt to manage such negative behavior.<sup>11,12,14,15</sup> However, relatively few studies have

focused on self-reported, recollected differences in a patient's perceived fear and anxiety behavior prior to and after the administration of psychopharmacological agents.

Panic disorders, social anxiety disorders, compulsive disorders, depression, and traumatic disorders represent a major portion of the anxiety disorders treated by psychiatrists and seen by dentists. In recent years, a group of psychopharmacological therapeutic agents known as selective serotonin reuptake inhibitors (SSRI) and selective serotonin norepinephrine reuptake inhibitors (SSNRI) have become the first choice for the treatment of depression, anxiety/panic attacks, and obsessive-compulsive disorders due to the fact that they are better tolerated, safer than the older classes of antipanic drugs—such as benzodiazepines, tricyclic antidepressants, and monoamine oxidase inhibitors—and possess low lethality in overdose.<sup>17-20</sup>

The difficulty and stress encountered by dental practitioners in treating this subset of the patient population has often left some reluctant to treat these individuals. This may be attributed to the lack of adequate formal training and experience in emotional and somatoform disorders in the dental curriculum during the early academic years. Additionally, patients suffering from these disorders sometimes miss appointments and exhibit disruptive behavior. Some may also develop displaced anxieties over planned treatment, leading to mistrust and the belief that the agreed-upon treatment is not working. When taking the patient's history, practitioners often note the presence of psychotherapeutic agents as well as other prescription medications and may, because of a previous difficult experience or lack of train-

ing, harbor some fears regarding future potentially negative behavior and interruption in treatment. However, the use of newer antidepressants, such as SSRIs or the newer atypical SSNRIs, including Effexor XR (venlafaxine) and Cymbalta (duloxetine), may not necessarily be an early indication of a difficult patient ahead. The presence of any psychopharmacological agent in a patient's medical history may be an indication of a patient who will contact a dental provider less frequently, but it may also indicate a patient with a more positive attitude and one who is more receptive to dental treatment.<sup>16</sup>

To examine this clinical phenomenon of whether patients' recollections of prior negative fear and anxiety and their current lessened fear and anxiety is due in some part to the use of these psychotherapeutic agents, it is essential that both the patients' past and present attitudes to treatment be considered in detail. If these negative feelings and emotional levels are demonstrated to have lessened, to some degree, in all of the study subjects, then the data from this study may be a clinical indication that a poor response to treatment, a negative patient-practitioner relationship, and stress may not always exist in this subset of the dental population.

### Materials and Methods

This study was conducted to investigate whether patients on certain psychopharmacological agents have lower levels of stress and avoidance with regard to dental visits than they recall having had prior to their initiation of treatment with these agents. To examine this hypothesis, a dental anxiety questionnaire (DAQ) was created within the undergraduate clinic of Tufts University School of Dental Medicine (TUSDM). Patients were selected from among those individuals whose medical history indicated the use of these specific SSNI and SSNRI therapeutic agents. Data was collected on the age and gender of the patients, as well as the name and duration of use of their specific medication. The DAQ consisted of a list of situations, behaviors, and experiences chosen from prior studies shown to elicit fear, anxiety, and negative behavior.<sup>5-7,11-13</sup>

The DAQ consisted of two parts. The first part was designed to ask

patients to recollect and grade their past experiences and levels of fear and anxiety before they began taking SSRIs or SSNRIs. The second part was a duplicate of the first part, except that respondents were asked to grade their present-day levels of fear and anxiety while currently being treated with SSRIs or SSNRIs. Patients were also asked to evaluate their overall feelings and attitudes toward dentistry both before and after treatment with their specific medications. Sixty subjects who met the inclusion criteria were initially screened, and eight declined to participate, resulting in a sample of 52 subjects.

### Data Analysis

Mean and standard deviations are reported for continuous variables and frequencies, and percentages are reported for categorical variables. Results from the DAQ were converted to binary responses to facilitate data analysis. Answers "0-not at all," "1-a little anxious," and "2-moderately anxious" were considered to be negative responses with no measurable degree of fear or anxiety, and answers "3-markedly anxious," "4-severely anxious," and "5-avoided dental care" were considered positive responses to fear, anxiety, and negative behavior levels. Feelings of anxiety before and after taking the medications were compared using McNemar's test for paired binary data. All *p*-values less than 0.05 were considered statistically significant. All analyses were performed using SAS, version 9.1.

The mean age of the 52 subjects was 48 years with a standard deviation of 13.5. Twenty (38.5 percent) were males. Prozac (SSRI) and Effexor XR (SSNRI) were the most common medications taken by study participants, with 14 subjects (26.9 percent) taking each. This was followed closely by Paxil, which was taken by 12 subjects (23.1 percent). Nine subjects each (17.3 percent) took Zoloft and Celexa (see Figure 1). The overwhelming majority of subjects (*n* = 49) were taking only one medication (94.2 percent). Of the remaining subjects, one (1.9 percent) was taking two medications, one (1.9 percent) was taking three medications, and one (1.9 percent) was taking four medications.

Thirty-two of the subjects (61.5 percent) had been taking their medication for more than one year, nine (17.3 percent) had been taking their medication for between six months and one year, five (9.6 percent) had been taking their medication for between three and six months, four (7.7 percent) had been taking their medication for between one and three months, and five (9.6 percent) had been taking their medication for only one month.

The most common condition that necessitated taking medication was depression, with 33 subjects (63.5 percent) answering that they suffered from this condition. This was followed by 18 subjects (34.6 percent) having uncontrolled anxiety, and 16 subjects (30.8 percent) having panic disorder. Three subjects (5.8 percent) suffered from abuse, and two (3.8 percent) suffered from obsessive-compulsive disorder.

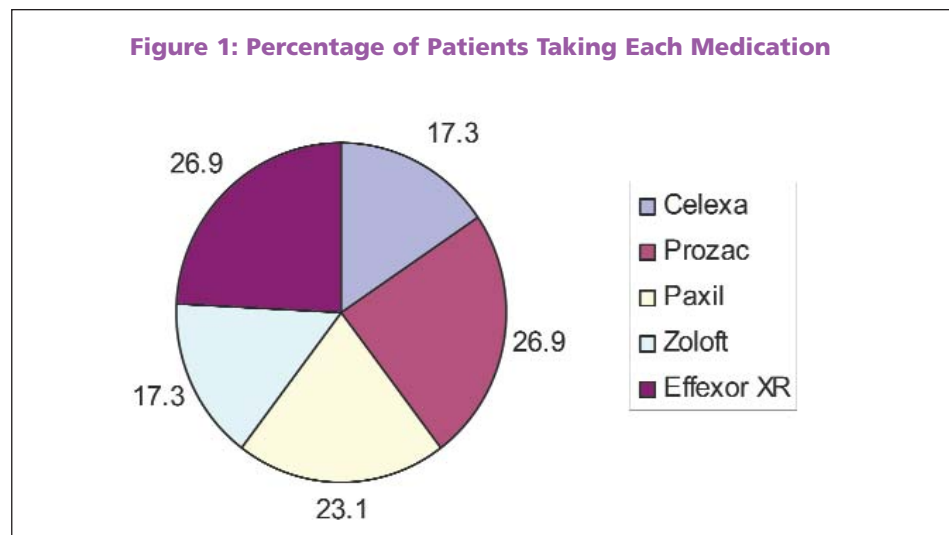


Figure 1. Illustration of the various antipanic/antidepressive medications and the percentages of medications prescribed to the study participants.

## Results

The results of the DAQ, which can be found in Figure 2, illustrate the difference in subjects' recollected feelings when comparing dental anxiety/fear, negative attitudes, and behavior levels both before and after taking their respective medications. All changes were statistically significant, with the most pronounced differences being found in Question 1—"How anxious were you by the thought of the dental appointment before the actual visit?" For this question, 23 subjects (44.2 percent) answered in the affirmative compared to only four (7.7 percent) who answered "yes" after having taken their specific medication ( $p < 0.0001$ ), indicating a marked reduction in fear and apprehension after the initiation of treatment. Answers to Question 14—"Overall feelings, concerns, fears, and anxieties regarding dental treatment" also indicated a marked reduction in anxiety from previously indicated higher levels of negative emotions, down from 46.2 percent before taking medication to 11.5 percent after therapy, resulting in a  $p$ -value of  $< 0.0004$ . Further analysis demonstrated no relationship between duration of medication, type of disorder, and lessening of fear experienced.

Other questions indicating highly statistically significant results in self-

perceived anxiety/fear included Question 3—"When not informed by your dentist what was to be done in this visit," with 25 (48.1 percent) answering in the affirmative before medication but only 9 (17.3 percent) answering in the affirmative after treatment ( $p < 0.003$ ). The same differences in the following questions indicate higher levels to lessened levels of fear and concern after therapeutic applications and allow for accepted periods of effectiveness, such as in Question 6—"With the amount or lack of attention given to your feelings," with 21 (40.4 percent) responding with feeling greater fear and anxiety prior to medication treatment to only 11 (21.2 percent) after treatment ( $p < 0.0075$ ). The same may be said of Question 11—"When the dentist fails to pay attention to your needs and goals," with 28 (53.8 percent) professing prior concern and fear, whereas only 14 (26.9 percent) seemed to be bothered after medication treatment ( $p < 0.0010$ ).

## Discussion

The advent of behavioral science some years ago and its marked emphasis in the curriculum of many dental schools has led to greater observation and questioning by both practitioners and students alike into the causes of positive or negative behavior exhibited by patients in the

dental chair. Among the multiplicity of information sought in a patient's past and present history are medical, dental, psychological, and pharmacological experiences. These responses may indicate a variety of existing emotions of fear, anxiety, and negative behaviors—some the result of false cognitive attributes learned through vicarious experiences, as well as through direct experiences that affect treatment outcomes. The presence of different types of medications may give a clue to a variety of emotional as well as medical disorders that may impact the ability to provide optimum care. Failure to fully collect this knowledge may ultimately play a role in furthering and/or worsening already-present negative emotions and affect treatment compliance. The burden of proper assessment and use of this knowledge will directly depend on the practitioner's acumen and time spent in history taking.

Previous studies have demonstrated that certain behaviors, situations, and attitudes on the part of the practitioner play an important role in whether or not a patient is satisfied with his or her dentist and thereby less fearful of the dental experience.<sup>5,8,11-13</sup> The DAQ incorporated many of these items from the previous studies. Information from these studies helped provide clues to a patient's behavior with-

**Figure 2: Dental Anxiety Questionnaire (DAQ)**

Question: Anxiety Experienced . . .	Before Medication		After Medication		<i>p</i> -value
	<i>N</i>	Percentage	<i>N</i>	Percentage	
1. By the thought of the dental appointment before the actual visit	23	44.2%	4	7.7%	<0.0001
2. When you hear the sound of a drill	27	51.9%	11	21.2%	<0.0011
3. When not informed by your dentist what was to be in this visit	25	48.1%	9	17.3%	<0.0003
4. By the thought of past dental experiences	27	51.9%	17	32.7%	<0.0330
5. At the sight of dental instruments	21	40.4%	8	15.4%	<0.0008
6. With the amount or lack of attention given to your feelings	21	40.4%	11	21.2%	<0.0075
7. When the dentist was impatient and rushed to begin treatment	23	44.2%	15	28.8%	<0.0325
8. When the dentist did not take the time to answer your questions	25	48.1%	15	28.8%	<0.0253
9. When the dentist did not explain the risks and benefits of the treatment	25	48.1%	16	30.8%	<0.0290
10. When the dentist begins to work before the Novocaine has taken effect	30	57.7%	20	38.5%	<0.0124
11. When the dentist fails to pay attention to your needs and goals	28	53.8%	14	26.9%	<0.0010
12. When the dentist pokes fun at and minimizes your fears	25	48.1%	16	30.8%	<0.0290
13. When the dentist did not provide a signal in case you need to stop	23	44.2%	12	23.1%	<0.0076
14. Overall feelings, concerns, fears, and anxieties regarding dental treatment	24	46.2%	6	11.5%	<0.0004

**Figure 2. Results of responses to dental anxiety questionnaire presented to the participants. *N* = the number of individuals whose responses were considered positive to being bothered by fear, anxiety, avoidance, and percentage (%) = number of respondents from the total study group responding to a particular question. Only "markedly" (3), "severely fearful" (4), and "avoidance" (5) were considered in tabulating the results for differences in before-and-after use of medications.**

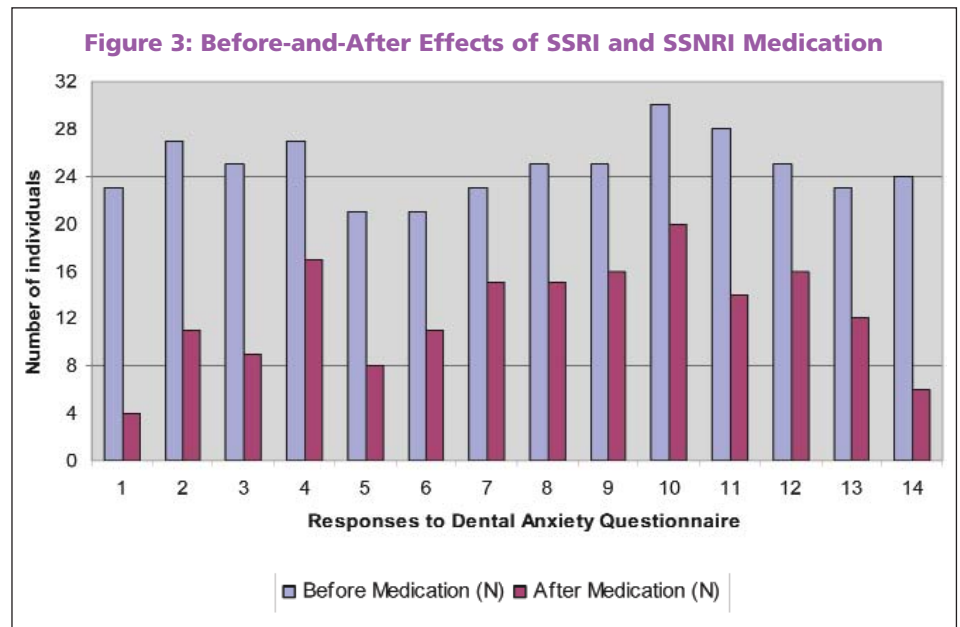


in the dental environment and allow a practitioner to customize treatment plans to ensure treatment compliance.

During the initial examination, a group of patients was found to be responding to a variety of verbal and written behavioral questions that seemed to indicate that they recollected experiencing higher degrees of fear and anxiety in prior years, even to the point of avoiding treatment in some instances. On further questioning, they indicated that most of them presently seemed to no longer harbor such severe and intense negative attitudes and fearful emotions regarding the dental visit. Common amongst the medical information in these patients' histories was that they all suffered from some emotional or psychiatric disorder and all were being treated with psychopharmacological agents, either SSRIs or SSNRIs.

The goal of this study was to determine if any of the individuals taking these medications were previously frightened and/or anxious patients who avoided dental treatment; if their current present-day levels of fear, anxiety, and avoidance of dental care were reduced; and if so, if this was the result of these medications.

The data seems to indicate that marked differences existed in the various situations and experiences outlined in the DAQ when recollections of previous feelings, anxieties, and negative attitudes were compared with current responses to the same questions. In the previous studies mentioned above, Question 8—"When the dentist did not take the time to answer your questions"—such as discussing the associated risks, benefits, and time constraints of treatment—resulted in a 19 percent reduction in individuals' level of fear prior to taking the medication to after taking it. The same reduction in levels of fear and negative attitude are noted with Question 5—"At the sight of dental instruments," from a premedication level of 40.4 percent responding as experiencing fear down to a lessened level of concern and negativity of 15.4 percent. The same phenomenon is seen in Question 6—"With the amount or lack of attention given to your feelings," where a previously demonstrated cause of anxiety resulting from a practitioner's apparent lack of empathy toward a patient's feelings or goals showed nearly a 50 percent reduction after medication to that particular perceived dentist personality charac-



**Figure 3. The results of data shown in Figure 2 illustrating the marked reduction in fear, anxiety, and negative concerns before and after use of antipanic/antidepressive agents.**

teristic. Question 14, which asked the respondents to compare their overall feelings toward dentistry and dental care, also demonstrated a marked reduction from 46.2 percent to 11.5 percent in negativity, fear, and anxiety.

Other marked differences between the before-and-after medication levels can be seen in Figure 3. The data seems to suggest that those individuals who previously recalled being frightened, anxious, or phobic to dentistry were less so due to some possible beneficial secondary effect of well-being associated with their specific regimen of medication. Past psychiatric investigations suggest that it takes up to six to eight weeks to exert antipanic/antidepressive action.<sup>17-20</sup> Since the data indicates that the vast majority of subjects (61.5 percent) were on their medication for well over six to eight weeks, the drug levels were in effect operating at their designated optimum levels. Therefore, in some way there exists a link indicating a beneficial side effect from these medications for the dental setting.

### Limitations

The results of this study rely on the patients' recollections of their attitudes and behaviors prior to initiating drug therapy. Therefore, it should be noted that it is not possible to assess the accuracy of patients' responses regarding past feelings and emotions as the effects of their current medications may cloud these recollections.

It should also be noted that SSNRI agents like Effexor XR and Cymbalta are norepinephrine reuptake inhibitors that block the reuptake of the neurotransmitters within the central nervous system synapses as part of their mechanism. It has been suggested that vasoconstrictors, such as epinephrine, be administered with caution and practitioners should monitor the vital signs in dental patients taking antidepressants that affect norepinephrine in this way. Effexor has also been noted to produce a sustained increase in diastolic blood pressure and heart rate as a side effect, and as with tricyclic antidepressants (such as amitriptyline and nortriptyline), these agents have the potential to initiate a hypertensive crisis if epinephrine is used in excess in anesthetics in conjunction with these agents.<sup>21</sup>

### Conclusions

All dental practices may experience difficult, frightened, severely anxious, and emotionally unstable patients. The belief that some individuals under treatment for various emotional, psychological, psychiatric, and somatoform disorders with psychopharmacological agents are always predictors of possible missed appointments, lack of trust, poor tolerance, and prolonged treatment time may not be accurate in many instances. This study done at Tufts University School of Dental Medicine found that all the study individuals treated with SSRIs and

SSNRIs seemed to recollect experiencing greater varying levels of fear and anxiety to a variety of previously experienced dental situations before versus after starting treatment with their specific medications.

The phenomenon that each respondent assessed some lessened levels of fear and anxiety presents some very interesting findings; however, that this phenomenon exists in this study is not meant to indicate or advocate the use of these agents in those individuals who are solely fearful of dental treatment. Hopefully, further and more detailed studies, combined with continuous education at all levels of the dental profession, will be performed to verify this phenomenon. ■

### Authors' Note

This study was approved by Tufts University Health Science Center and Tufts New England Medical Center, Internal Review Board Study #7997.

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# MDS Beacon Hill Day

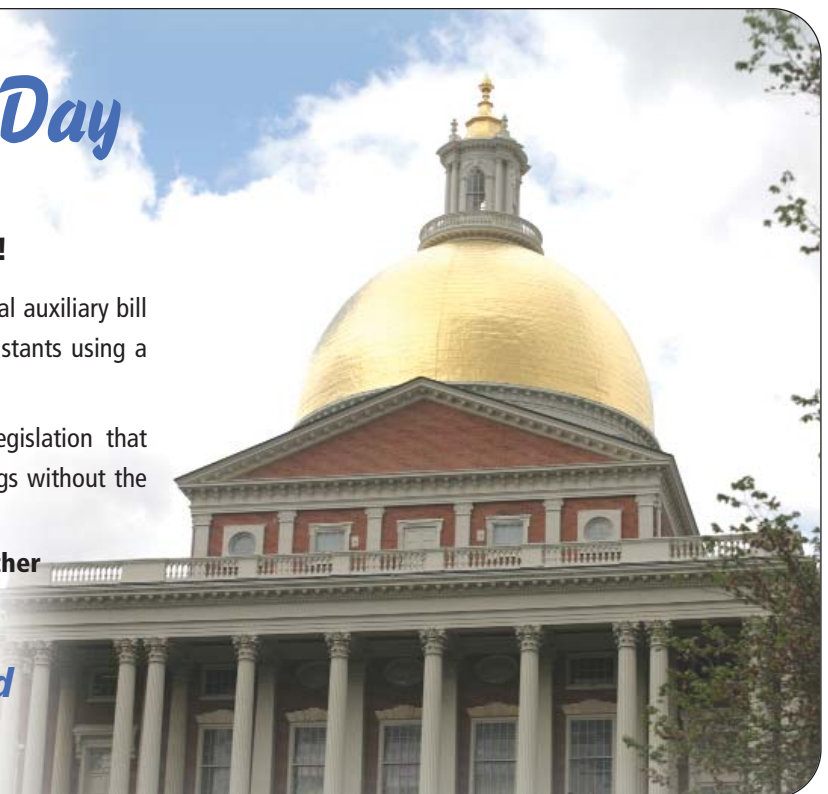
Wednesday, May 21, 2008

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# TEN UNDER 10

# 2008

Since 2005, the JOURNAL OF THE MASSACHUSETTS DENTAL SOCIETY, in conjunction with the MDS Standing Committee on the New Dentist, has highlighted 10 MDS member dentists who have been in the profession for 10 years or less—the “Ten Under 10.”

This year, the fourth year, is no different. On the following pages, you will meet the 2008 Ten Under 10 and learn more about their thoughts on organized dentistry, the challenges they faced when they first joined the profession, how they balance their professional and personal lives, and more.

To qualify for selection for the Ten Under 10, dentists must have graduated from dental school in the past 10 years and have made a significant contribution to the profession, their community, or organized dentistry. A call for nominations was sent to MDS member dentists in the fall (nominees are required to be current MDS members) as well as solicited on the MDS Web site and in the MDS NEWS. Nominations were reviewed and final selections were chosen by the MDS Standing Committee on the New Dentist in December.

Congratulations to the 2008 Ten Under 10—the future of professional dentistry.



## Gregory An, DDS, MPH

**Residence:** Waltham

**Office Locations:** Peabody and Cambridge

**Specialty:** General Dentistry

**Education:** University of Michigan School of Dentistry; Harvard School of Dental Medicine; and Harvard School of Public Health



### Why did you choose dentistry as a career?

I never visited the dentist as a young child. Our family had recently immigrated to the United States and had limited financial resources. It wasn't until a toothache as a young teenager that I saw a dentist for the first time. This experience left several impressions. I realized that most of the treatment rendered could have been prevented and that the cost of care was high. I learned what it felt like to be on the receiving side of dental procedures. My career has been shaped by these impressions and by a desire to discover ways to make the oral health care experience better for others.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

Graduating school with loads of debt left me feeling pressured to pay it back as quickly as possible. I decided to commit part of my time to practicing in underserved communities and academics while spending the remaining time in a multispecialty practice. If I chose to work solely in a private practice, I could pay off my loans more quickly. But I knew that I would have to be happy with my choice, and my choice would have to fit my beliefs. It was the right choice.

### What has been the biggest reward you have experienced since you left dental school?

One memorable experience was receiving my first grant award from a private health care foundation. The grant was used to implement a program that would address disparities in health among ethnic minority groups. The award gave me a sense of affirmation and validation for the work I was doing.

### What advice would you give to a student graduating from dental school this year?

The field of dentistry is constantly evolving. I noticed some of the things I learned in dental school in lectures and textbooks were outdated by the time I graduated. It really is necessary to keep yourself updated on the literature.

### How do you balance your professional and personal lives?

I still struggle with balancing the two. However, I feel incredibly fortunate to have a supportive wife. With her help, I have found that carving out time away from work allows me to pursue my hobbies, travel, spend time with my family, and gain a fresh perspective.

### Where do you see yourself in 10 years?

Doing what I do today: mentoring, teaching, and practicing in private and community settings. Wherever I am in 10 years, I hope that I will continue to be a positive influence in the lives I come across. ■

## Ekaterini Antonellou, DMD, MS

**Residence:** Natick

**Office Locations:** Boston and Cambridge

**Specialty:** Prosthodontics

**Education:** University of Athens in Greece; Tufts University School of Dental Medicine



### Why did you choose dentistry as a career?

I had always visualized myself in a health care profession because I enjoy helping people. Dentistry combines science and art as well as attention to detail, and it is very challenging as a career.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

The biggest challenge when I began my teaching career at Tufts University was to teach students who, at the time, were not much younger than I was. Once I worked with them on clinical cases and instructed them in my courses, I was able to gain their respect and trust as a teacher.

### What has been the biggest reward you have experienced since you left dental school?

My biggest reward professionally was my promotion to director of clinical and preclinical fixed prosthodontics and the recognition of my services as a teacher from my students and my peers. I also enjoy meeting former students at dental meetings and learning how much they have progressed professionally. My biggest reward personally is having a great husband who supports me with my career, and two daughters (Irene, 7, and Ellie, 4) who patiently wait for Mommy to come home late when I teach the evening clinic sessions at Tufts.

### What advice would you give to a student graduating from dental school this year?

I would advise them to always stand by their work ethics and get involved with their local and national dental societies so that they can give back to their profession. Also, it is always nice to come back and volunteer their services for teaching.

### How do you balance your professional and personal lives?

I was able to advance in my career with the help and support of my family, and not only my husband and daughters. My mother came over from Greece and helped me for a year and half with each child and took my children to Greece for two months when I had to study for my prosthodontics boards.

### Where do you see yourself in 10 years?

I truly enjoy teaching, so I think in 10 years I will probably still be teaching and seeing patients in an intramural private practice. I like the combination of providing services to both students and patients. The appreciation that I get back when I help a student or when I finish a challenging prosthodontics case makes me certain that I made the right decision when I joined this profession. ■

## Todd Belf-Becker, DMD

**Residence:** Marblehead  
**Office Locations:** Revere, Boston  
**Specialty:** General Dentistry  
**Education:** Tufts University School of Dental Medicine



### Why did you choose dentistry as a career?

I've been exposed to dentistry all my life; my father and grandfather are dentists. Seeing how much they enjoy their work clearly influenced me, but I was never pressured to choose this profession. I have many fond childhood memories of being in the family office and also attending Yankee Dental Congress, which was my first exposure to the dental community in general.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

Sometimes patients—those older than I—would say that I seemed too young to be a dentist, so it was up to me to demonstrate that despite my relative youth, I was a highly professional practitioner. In other words, disproving an age bias some patients may have had was an early challenge.

### What has been the biggest reward you have experienced since you left dental school?

Nothing is as satisfying as making patients happy. I particularly enjoy the challenge of calming anxiety to make nervous patients more comfortable. Volunteering for the MDS is rewarding, as well, and working on the Mobile Access to Care (MAC) Van is a highlight, since it has such an immediate impact on children in need.

### What advice would you give to a student graduating from dental school this year?

I can't imagine anyone is completely comfortable when first starting in private practice. What helped me immeasurably was finding a practice with experienced dentists whom I trust, who were happy to help and share their knowledge, and who were never impatient about answering any questions I may have had. Also, it's never too early to start with continuing education courses. Participation in your district societies, as well as in the MDS in general, is a great way to stay involved and also informed as to where the profession is going.

### How do you balance your professional and personal lives?

I find that one of the great parts of this career is that I don't take it home with me. I enjoy being at work, but I am able to keep home and work separate. Although I have to admit that at many dinners with family or friends, the conversation does veer toward teeth.

### Where do you see yourself in 10 years?

I see myself right where I am, continuing to learn, staying involved, and having fun with dentistry. ■

## Jeffrey M. Casiglia, DMD, DMSc

**Residence:** Salem  
**Office Location:** Salem  
**Specialty:** General Dentistry  
**Education:** University of Pennsylvania School of Dental Medicine; Harvard School of Dental Medicine; Diplomate, American Board of Oral Medicine



### Why did you choose dentistry as a career?

I was premedicine in college, thinking I might go into neurosurgery. However, I started developing jaw pain and clicking, so I went to see an oral surgeon. When I told him I was premed, he asked, "Have you ever thought of doing this?" The rest, as they say, is history.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

Finding the right associateship. When I first started, I ran into a few situations that were exploitative, or even abusive in one case. At one point, I questioned whether I would stay in dentistry. However, I eventually joined a terrific group on the Cape that turned everything around and led me to where I am today.

### What has been the biggest reward you have experienced since you left dental school?

From a personal standpoint, it would be owning and rehabilitating my own practice. I bought a practice that would have been considered "failed" about two years ago. Now, I have built it into something where the patients and staff are treated the best way I can. The practice is located in a historic building, which we have restored piece by piece. This kind of top-to-bottom involvement in the practice is truly gratifying. I'm grateful to still be involved in teaching. I think we all bear the responsibility of sharing what we know.

### What advice would you give to a student graduating from dental school this year?

Get more training. And then . . . more training. Four years of dental school, in my opinion, is really not enough. Anyone who doesn't specialize should definitely do a GPR or an AEGD. If you go right into practice, find someone who will mentor you and who isn't interested in just getting a body in their practice so they can reduce their hours. Also, carefully consider your employment offers.

### How do you balance your professional and personal lives?

I don't have to. My wife is involved in my practice so we can talk shop if we have to. But somehow, we have always struck a good balance. I also vowed that I would never allow dentistry to out-prioritize family, and I have her to tell me if I do that.

### Where do you see yourself in 10 years?

Still practicing in Salem, as well as teaching and lecturing. I want to grow the oral medicine portion of my practice. Very few board certified oral medicine/oral pathology dentists are accessible in the private practice setting, and I am out to change that. ■

## Sandra J. Crowley-Le, DMD

**Residence:** North Grafton  
**Office Location:** Northborough  
**Specialty:** General Dentistry  
**Education:** Tufts University School of Dental Medicine



### Why did you choose dentistry as a career?

I must admit that dentistry was not my first career path. Previously, I had worked as a marine biologist and biomedical researcher. However, I am privileged to say that dentistry has, by far, been my most rewarding and fulfilling career choice. Dentistry allows me to combine my love of the medical field with the artistry of biological sciences while providing direct patient care.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

At the start of my career, my biggest challenge was balancing patient care with practice management, and juggling in my personal life. You learn a lot very quickly through trial and error. I especially want to note that my mentor—now my business partner—has been extremely supportive of me.

### What has been the biggest reward you have experienced since you left dental school?

My greatest reward professionally has been my colleagues. I have been involved with organized dentistry since before graduation, and the resources available are great; however, the one-on-one contact with those whom I share this career is even better. My greatest reward personally is the ability to work with my patients, seeing how my skills can develop a new smile and return function to someone's life.

### What advice would you give a student graduating from dental school this year?

Dental school is not dentistry. You have only just begun when you walk out that door with a diploma. Take every CE course you can find and get involved with your community. You will learn quickly what you love and, because you love it, you will excel at it.

### How do you balance your professional and personal lives?

There will never be enough hours in the day for me to find the perfect balance. Something always has to give; it is choosing what and when that is the challenge for all of us. Life is too short to take yourself too seriously, and a good laugh helps keep you balanced.

### Where do you see yourself in 10 years?

In 10 years I hope to be exactly where I am today. I love my practice, my patients, and what I do. I look forward to continuing to be involved in organizations within my profession and hope someday to be able to add the role of instructor to my accomplishments. One title I added to my list this past March was "Mommy," a role I couldn't wait to start. ■

## Dara T. Cunnion, DMD

**Residence:** North Quincy  
**Office Location:** Waltham  
**Specialty:** Pediatric Dentistry  
**Education:** Boston University Goldman School of Dental Medicine



### Why did you choose dentistry as a career?

The decision was difficult since I had already trained at the Royal Ballet School in London as a professional ballet dancer prior to attending Princeton University. Ballet was a great love of mine, but I wanted to make a contribution to society that would give me lifelong fulfillment and also could afford me the opportunity to teach students and work with children. So I turned down a contract with a ballet company in England and matriculated at Princeton with the goal of one day becoming a health care professional.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

Fulfilling the responsibility of meeting your patients' needs and the expectations of their parents. It is an especially awesome responsibility taking care of a child. Earning a child patient's trust can be very challenging, but I cannot think of anything more rewarding.

### What has been the biggest reward you have experienced since you left dental school?

One of my mentors, Dr. John Caravolas, who has been in practice for more than 25 years, once said to me that the most rewarding aspect of pediatric dentistry is building lifelong relationships with your patients. Over the past six years or so that I have been practicing, I have found this to be so true. It is wonderful to be able to help parents and children prevent caries and other problems.

### What advice would you give to a student graduating from dental school this year?

I would reiterate a piece of advice that one of my mentors, the late Dean Spencer Frankl, once gave to me: To be a successful dentist, you must be a lifelong learner. You should try to learn something every day. Always strive to be better. Find a mentor. Join a study group.

### How do you balance your professional and personal lives?

It is very important to have a balance, but it is not always easy. Prioritizing is important because there is only a certain amount you can accomplish in your waking hours.

### Where do you see yourself in 10 years?

I hope that I would be doing more of what I am doing now: teaching dental students at BU; treating children in practice; contributing to the science of dental medicine through research; and volunteering and being involved in organizations such as the MDS and the Massachusetts Academy of Pediatric Dentistry. ■

## Mary Jane Hanlon-Rogers, DMD

**Residence:** Lexington  
**Office Location:** Lexington  
**Specialty:** General Dentistry  
**Education:** Forsyth School of Dental Hygiene; Tufts University School of Dental Medicine



### Why did you choose dentistry as a career?

I knew when I was 14 years old that I wanted to be a dentist. In high school, I told my guidance counselor (a male) and he responded “Oh no, dear, you want to be the hygienist!” Well, I didn’t want to be a hygienist, but just in case I couldn’t get into dental school, I applied to both. Then I severed the tendon in my right middle finger with a scalpel, which put me out of commission for 10 weeks, and they weren’t sure if I was going to have full use of the finger. So I opted for dental hygiene school. Fifteen years after graduating from dental hygiene school, I graduated from dental school.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

I think the biggest challenge is finding the right staff for each position you have in your office. Finding the right person with the right attitude and work ethic is so important.

### What has been the biggest reward you have experienced since you left dental school?

I think the most rewarding experience is to look back on what you have developed and accomplished. Having patients compliment you for having such a friendly office or taking the time to write thank-you notes to you for work they appreciate is the most wonderful thing. You know that all your hard work is paying off.

### What advice would you give to a student graduating from dental school this year?

I think the most prudent thing to do when you have no prior experience in dentistry or working in a practice is to do a residency or work in a very large practice where you will gain a lot of experience and have the benefit of experienced doctors to ask questions of. Do this for a minimum of two years, and then look for an established practice to purchase. Starting a practice from scratch has its benefits; however, it has its drawbacks, too.

### How do you balance your professional and personal lives?

I try to put my practice first during the week and my family first on the weekends. There are times when it doesn’t always work out well, but my family knows when Mom is happy, they are happy. So it is best to keep Mom happy!

### Where do you see yourself in 10 years?

Realistically, I would like to be retired in 10 years having spent 20 years as a dentist and 15 years as a hygienist. I have many hobbies, including sports photography, that I would like to pursue. ■

## Amelia Grabe Lane, DMD

**Residence:** Dennisport  
**Office Location:** Chatham  
**Specialty:** General Dentistry  
**Education:** Boston University Goldman School of Dental Medicine



### Why did you choose dentistry as a career?

I had known since I was 7 years old that I wanted to become a doctor. I grew up in a small town in New Hampshire where my father is a general dentist. In high school, I determined I wanted to become a dentist because I wanted to have my own business. I knew dentistry would provide me with the independence that I desired.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

I purchased my practice a few months after I graduated from dental school. I cannot stress how grateful and lucky I am that I had inherited a phenomenal team of women with the practice. These women were crucial in helping the patients adjust, as well as helping me to start building the practice I wanted. In addition, I have just started at the Pankey Institute to help me build a vision for my practice and to give me the skills to achieve it. And if not for my father’s advice and encouragement, I would never have been able to go straight into owning my own practice.

### What has been the biggest reward you have experienced since you left dental school?

My biggest reward has been starting to build roots as a valued member of my community. I feel the best way I have been able to do this is through volunteering, both on the Mobile Access to Care Van and through Rotary International. My goal is to build a foundation in organized dentistry that can be used to serve my community.

### What advice would you give to a student graduating from dental school this year?

“Know what you know; know what you don’t know.” They call it the *practice* of dentistry because you will never know all there is to know, even when you’ve been practicing for 50 years. There is always something new to learn.

### How do you balance your professional and personal lives?

It has taken me two years to get an idea as to how to do this, and I’m getting better at it every day. My primary rule has always been that weekends are sacred for personal life, and weekdays are for the professional life. But this rule is flexible.

### Where do you see yourself in 10 years?

I see myself continuing to build my practice into a cutting-edge dental practice focused on providing excellent patient care and expanding on the spa dentistry concept. I hope to have a family, and increase my leadership involvement in organized dentistry, and continue helping to make my community a better place. ■

## Jennifer L. Nelson, DMD

**Residence:** Attleboro  
**Office Location:** Attleboro  
**Specialty:** General Dentistry  
**Education:** University of Louisville  
School of Dentistry



### Why did you choose dentistry as a career?

Dentistry really is the only profession I have ever thought of doing. I was introduced to it by my father, Dr. Philip J. Gregorio. My parents advised me to go to dental hygiene school. They knew I loved dentistry, but they wanted me to be sure I enjoyed working on patients. At the time, I wasn't happy to go into hygiene, but now I realize that the time spent as a hygienist has really helped me as a dentist.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

The biggest challenge I had when I began my career was realizing how hard I was going to have to work to start paying off dental school debt. My situation is different from that of the normal graduate because I am married with two small children. After one year of working as an associate, I found a practice for sale in the same town in which we live. What I found out about buying an existing practice was that immediate income really helped me to make a decent income to pay my bills and live.

### What has been the biggest reward you have experienced since you left dental school?

The biggest reward I have had is the relationships with my staff and the community. I didn't know how the community would feel about a new dentist. It has been such a humbling experience to see my staff and patients have such faith in my abilities and me.

### What advice would you give to a student graduating from dental school this year?

First, work where you want to live; don't live where you want to work. It is so important for our overall health to enjoy each day, and by living in a place you love, that is so much easier. Second, own your own practice. Just do it—and sooner rather than later. You will need to be up-to-speed on procedures so you can provide good dentistry at a reasonable rate of speed. Being an associate in a fast-paced environment for a year or two will help to achieve this.

### How do you balance your professional and personal lives?

Balancing my professional and personal lives is easy, most of the time. I have to make my schedule fit my lifestyle. I also employ an associate dentist, which allows me to have expanded hours but still work the schedule that best suits me and my family.

### Where do you see yourself in 10 years?

I see myself continuing to work four days a week and having the office open six days a week. I really enjoy dentistry and can't see doing something else. ■

## Thanh Trang Nguyen, DMD

**Residence:** Holbrook  
**Office Location:** Statewide mobile dental program  
**Specialty:** General Dentistry  
**Education:** Tufts University School of Dental Medicine; Lutheran Medical Center



### Why did you choose dentistry as a career?

Having grown up in Vietnam, where oral health does not get the attention that it deserves, I appreciate the importance placed on the healthiness and esthetics of teeth. Here in the United States, I saw the array of possibilities that dentistry could achieve, ranging from relieving pain to raising self-esteem by brightening a smile.

### What was the biggest challenge/obstacle you experienced when you began your professional career?

I arrived in the United States in 1991 as a political refugee. I started dental school in 1998 and my professional career in 2002. I found language to be my biggest obstacle. Not knowing a word of English before arriving in the United States, I had trouble learning the conversational vocabulary, not to mention the medical terms. In a career in which patient care is so important, I wanted to make sure that I had good listening skills to understand patients' needs and verbal skills to provide clear instructions to the patients.

### What has been the biggest reward you have experienced since you left dental school?

I get a very strong sense of fulfillment whenever a patient gets up from my dental chair with less pain or more confidence than when he or she entered the clinic.

### What advice would you give to a student graduating from dental school this year?

One of the best professional decisions I made was to commit to the advanced education in general dentistry (AEGD). My advice for graduating students would be to not rush into practicing, but rather to take the time to deepen their knowledge and strengthen their skills through advanced education. Knowledge and skills are an important foundation, and it would be wise to start building on it earlier in their career.

### How do you balance your professional and personal lives?

I am very fortunate to have a flexible working schedule. In performing mobile dentistry, I am able to design a schedule that allows me to have both a career and a meaningful personal life. Time is a limited commodity for us all, and I find that managing time alone is not enough; managing my energy is important as well. I make sure that I have enough energy to focus on the activity at hand by keeping myself healthy through a balanced diet, regular exercise, and a healthy dosage of community work.

### Where do you see yourself in 10 years?

In 10 years, I would like to have my own well-established practice. ■





# Communication: A Case Against Underocclusion

**PHILIP MILLSTEIN, DMD, MS**

*Dr. Millstein is a prosthodontist with a practice based in Cambridge. He is chair of the Middlesex District and a former MDS Trustee.*

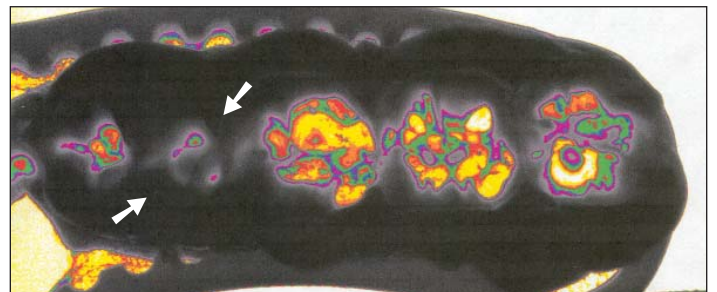
**H**ypo-occlusion is another term for underocclusion. This condition is often caused during crown-and-bridge procedures where an incorrect mounting of opposing dental casts, the injudicious polishing of the occlusal surface of a cast restoration, or the intended placement of an occlusal shim prior to the casting will guarantee a close occlusal contact—one that doesn't make contact. Hypo-occlusion may also take place during routine restorative work where the clinical operator "ditches" the restoration for assumed longevity. Implant specialists often advocate to the restorative dentist that their implants should be constructed with no lateral interferences and with a light centric contact or one that is just underocclusal contact. What exactly does this mean?

The dental assumption is that teeth will normally articulate if in hypo-occlusion and that they will erupt in an even fashion and assume a uniform occlusal contact and contribute to a stable occlusal relationship. Such an idea is akin to that of removing a first molar in a growing child and hoping that the incoming second molar will follow suit. The idea that a hypo-occluded tooth will hyper-occlude into an idealized occlusion could be fantasy.

The stability of an occlusion is important because it affords a somewhat uniform set of occlusal contacts throughout the mouth. Hypo-occlusion can cause an occlusal disharmony. Adjacent teeth must assume new forces. Opposing teeth of the same quadrant may change in their occlusal position. Alternate quadrants may also follow the change. It is not uncommon to experience a domino-type effect wherein the teeth on the opposite side of the mouth fracture. Repairs may be made, but are they necessary? Is it not better to prevent hypo-occlusion than to risk a shift in the occlusion with possible negative results?

Prevention includes making sure that your dental casts are accurate representations of the oral structures. If triple trays are used, make sure that the patient fully closes. Use a gauze-type mesh. Plastic meshes interfere with closure and open the bite, thus inviting the manufacture of crowns in malocclusion. Sit down with the dental laboratory or write a detailed note. The crowns on the dies must be in occlusion on the master casts on which they are made; if they are not, then they won't be in occlusion when they are cemented to place. Waiting for a crown to super-erupt into occlusion after it is cemented isn't preferred. Having a patient enjoy no occlusal contact is not an answer to comfort. Waiting for an implant to erupt into occlusion is impossible. Getting it right from the beginning works and, besides, your product will be improved. Good results require working together well with an accredited dental laboratory.

Figure 1 is an occlusogram depicting an uneven functional occlusion in contact that was made by taking an imprint of the right quadrants using a triple tray with a fiber mesh and a fast-acting addition-type silicone. Upon set, the tray was removed and placed into a scanner and a picture was made. The colors represent different thicknesses of impression material as they relate to occlusal contact. White represents occlusal contact; the other colors represent near occlusal contact. Remember that occlusal contacts are fleeting. This picture represents occlusal contacts in a moment of time. The arrows indicate a hypo-occluded crown. ■



**Figure 1. An occlusogram depicting an uneven functional occlusion in contact.**

# A Clinico-Pathologic Correlation

**RYAN A. ABDOOL, DMD**

**LYNN W. SOLOMON, DDS, MS**

**MARIA B. PAPAGEORGE, DMD, MS**

Dr. Abdool is a first-year intern in the oral and maxillofacial surgery department, Dr. Solomon is an assistant professor in the oral and maxillofacial pathology department, and Dr. Papageorge is professor and chair of the oral and maxillofacial surgery department at Tufts University School of Dental Medicine.

## History

A 54-year-old male was referred to the Oral and Maxillofacial Surgery Clinic at Tufts University School of Dental Medicine for evaluation of an intraoral lesion on the left posterior buccal mucosa that was recently noted by the patient's primary care physician. The patient was asymptomatic and completely unaware of its presence. His medical history was significant for anxiety, nervousness, and depression.

On clinical examination, the patient presented with a soft multiloculated, yellowish, mobile, slightly exophytic lesion in the left posterior buccal mucosa just opposite the maxillary tuberosity, which measured approximately 2 x 1.5 cm (see Figure 1). There was a similar but smaller lesion in the same location on the right side and both had a "fat-like" appearance (see Figure 2). Both lesions were soft and nontender to palpation. The patient also had a palpable nontender submucosal mass in the left cheek area, which was clinically consistent with a lymph node. The remaining oral examination showed partial edentulism with only the first molars remaining in the maxilla and only anterior teeth in the mandible. There was no other evidence of pathology.

Both lesions were excised under general anesthesia in a day care surgical setting. The patient tolerated the procedure well and healing was uneventful.

## Differential Diagnosis

Dermoid cyst  
Lymphoepithelial cyst  
Sebaceous lymphadenoma

## Histological Findings

Histopathologic examination of the formalin-fixed tissues showed similar findings in both specimens. The surface epithelium was parakeratinized and intact. A thin zone of fibrous connective tissue surrounded a proliferation of variably sized and shaped nests, islands of sebaceous glands, and ducts without atypia. Many of the ducts showed squamous differentiation and keratinization, giving a preliminary low-power impression of possible adenosquamous carcinoma (see Figures 3a and 3b). A few small lobules of minor mucous salivary glands were present in

the sections, but were not part of the proliferative process. The background stroma contained a background of lymphocytes and lymphoid follicles (see Figures 4a and 4b).

Immunohistochemical staining was performed on formalin-fixed paraffin-embedded tissue to further evaluate the monocytoid lymphoid infiltrate. The germinal center B-cells were strongly positive for CD 20 and the interfollicular areas were strongly positive for T-cells. There was no kappa or lambda light chain restriction.

## Diagnosis

Sebaceous lymphadenoma

## Discussion

Dermoid and epidermoid cysts represent developmental malformations. When a cyst is lined with epithelium, it can be classified as an epidermoid cyst. When the lining contains one or more skin appendages, such as sebaceous glands, hair follicles, or sweat glands, the term dermoid cyst is applied. Oral dermoid cysts are most common in the first and second decades of life and can vary in size from a few millimeters to more than 10 centimeters in length, with their most common location being the midline of the floor of the mouth. The lesions are usually slow-growing and asymptomatic. With complete surgical excision, recurrence is rare. These lesions are benign in nature; however, malignant transformation to squamous cell carcinoma has been reported.<sup>1</sup>

Lymphoepithelial cysts in the oral cavity are uncommon lesions that develop within lymphoid tissues or may develop from salivary or surface mucosa that becomes surrounded in lymph tissue during embryogenesis. Oral lymphoepithelial cysts

are most common in the second decade of life but may occur at any age and are usually less than 1.5 cm in diameter. The most common locations are sites of normal or accessory oral lymphoid tissue such as the floor of the mouth, tongue, palatine tonsils, and soft palate. Treatment is not usually necessary; however, complete surgical excision is usually performed in order to obtain a definitive diagnosis. Malignant transformation does not occur.<sup>1</sup>

Sebaceous glands are a type of branched alveolar gland. Their holocrine excretory product, sebum, is discharged via a short duct. In the epidermis, sebaceous gland ducts terminate in the pilosebaceous unit of hair follicles or in sweat ducts of the penis, labia minora, and nipples. Meibomian glands are a specialized form of sebaceous gland at the rim of the eyelids. In the head and neck, extracutaneous, extraocular sebaceous glands are found in the lining mucosa of the oral cavity and the major salivary glands.

Nearly 80 percent of adults have sebaceous glands beneath the lining mucosa of the oral cavity. These glands are easily identified as yellow-white, single or grouped, pinhead-sized granules and clinically diagnosed as "Fordyce's granules." The most common locations are the lips and buccal mucosa. It is rare to find Fordyce's granules in the oral cavity of children younger than three years.<sup>2</sup> In the major salivary glands, sebaceous differentiation is found in 11 to 28 percent of normal parotid glands and 6 percent of normal submandibular glands, but rarely in sublingual glands.<sup>3</sup>

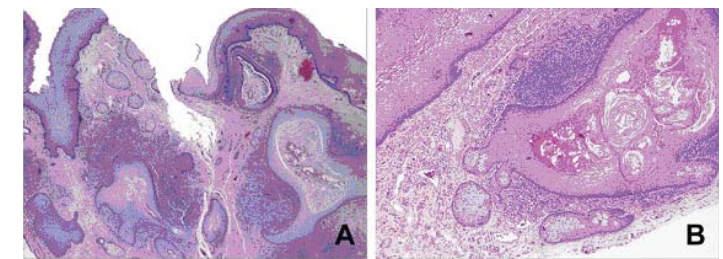
In spite of the prevalence of sebaceous differentiation in the oral cavity and major salivary glands, reports of primary salivary gland sebaceous neoplasms are relatively few in these locations. Sebaceous adenoma and sebaceous lymphadenoma are the two benign primary sebaceous neoplasms of salivary gland origin. Their malignant counterparts are sebaceous adenocarcinoma and sebaceous lymphadenocarcinoma, respectively.

A benign parotid tumor formed chiefly of sebaceous glands was given the name sebaceous lymphadenoma in 1960.<sup>4</sup> The sebaceous lymphadenoma is a well-circumscribed-to-encapsulated tumor composed of variably sized and shaped nests of sebaceous glands without atypia, often intermixed with different proportions of variably sized ducts, within a background of lymphocytes and lymphoid follicles.<sup>5</sup>

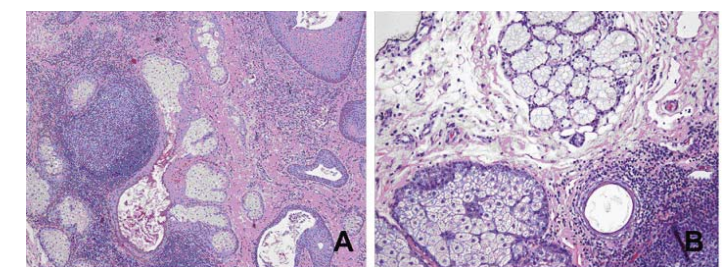
The majority of sebaceous lymphadenoma cases have occurred in the parotid gland or the periparotid lymph nodes. The source of the sebaceous differentiation that gives rise to these salivary gland neoplasms is unknown. There has been speculation that the sebaceous differentiation could arise from a metaplastic process secondary to ductal obstruction or originate from branchial cleft remnants or sebaceous gland inclusions in lymph nodes.<sup>3</sup>

## Conclusion

Extraparotid sebaceous lymphadenoma is extremely rare. The present case showed no connection with the parotid glands, as it was limited to the submucosal tissues. Although minor salivary glands were present in the sections examined, they were not associated with the neoplastic process. The tumor in this case is the first report of a primary intraoral sebaceous lymphadenoma with origin from Fordyce's granules.



**Figures 3a and 3b. H&E staining.** In Figure 3a, the proliferation of sebaceous nests, islands, and ducts is in the superficial mucosa underlying the stratified squamous epithelium (original magnification of 2X). In Figure 3b, surface epithelium is shown in the upper left corner of this photomicrograph. The sebaceous duct depicts squamous metaplasia with cystic dilation and prolific formation of keratin and sebum. A periductal lymphocytic inflammation is also present (original magnification of 4X).



**Figures 4a and 4b. H&E staining.** Figure 4a is a higher-power view of the sebaceous nests, islands, and squamous ductal differentiation and keratin production. A germinal center is seen in the lymphoid infiltrate (original magnification of 4X). In Figure 4b, a lobule of minor mucous salivary gland is contrasted with the adjacent Fordyce's granule. The periductal inflammation shows the monocytoid nature of the infiltrate (original magnification of 10X).

Sebaceous glands are not uncommon in the lining mucosa of the oral cavity, and minor mucous salivary glands are also liberally distributed in the oral cavity mucosa. Thus the question of origin of intraoral sebaceous lymphadenoma remains controversial. In the present case, the histopathologic differential diagnosis included sebaceous adenoma, sebaceous lymphadenoma, and sebaceous adenoma with low-grade lymphoma such as mantle cell or marginal zone. The final diagnosis of sebaceous lymphadenoma was made.

Sebaceous lymphadenoma is a benign tumor that will not recur if adequately excised. Our patient's recovery was unremarkable. ■

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**Figure 1. Intraoperative view of lesion on the left side. Note the "fat-like" appearance.**



**Figure 2. Intraoperative view of lesion on the right side.**



**VIKKI NOONAN, DMD, DMSC**  
**SPENCER KEMP, DDS**  
**GEORGE GALLAGHER, DMD, DMSc**  
**SADRU KABANI, DMD, MS**

*Dr. Noonan is associate professor, Dr. Kemp is assistant professor, Dr. Gallagher is professor, and Dr. Kabani is professor and director of the oral and maxillofacial pathology department at Boston University Goldman School of Dental Medicine.*

## TRANSIENT LINGUAL PAPILLITIS

**T**RANSIENT LINGUAL PAPILLITIS (TLP) REPRESENTS inflammation of fungiform papillae typically noted on the anterior dorsal tongue.<sup>1</sup> Occurring over a wide age range, these lesions present clinically as either one or multiple papules on the tongue that vary from red to yellow in color.<sup>2,3</sup> The papulokeratotic variant of TLP is remarkable for selective hyperkeratosis of the inflamed fungiform papillae.<sup>2</sup> Although this hyperkeratotic change typically imparts a white coloration to the papules, staining with foods, beverages, and tobacco products can cause a brown-to-black appearance.

Classically, the lesions are characterized by abrupt onset and measurable discomfort, and resolve spontaneously over the course of one to several days.<sup>1,2</sup> The lesions are typically transient in nature and represent an isolated occurrence; however, occasional reports of patients with frequent recurrence can be found.<sup>2</sup>

Although the etiology is uncertain and many possible associations, ranging from hormonal fluctuation to infectious etiology to smoking, have been described, hypersensitivity reactions to foods and dentifrice are frequently considered predisposing factors.<sup>3,5</sup>

Treatment for TLP is limited to palliative measures and removal of potential inciting agents (e.g., eliminating the use of candy, chewing gum, or oral hygiene products frequently associated with hypersensitivity reactions) until the lesions have resolved. ■

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**Figures 1 and 2. Two examples of transient lingual papillitis. Images courtesy of Craig B. Fowler, Col., USAF, DC (left), and Peter J. Giannini, DDS, MS (right).**

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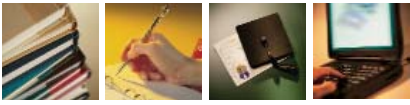
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# DENTAL EDUCATION

## MELISSA CARMAN, MANAGING EDITOR

Highlighting key events taking place in dental education in Massachusetts.

### Tufts University

NANCY S. ARBREE, DDS, PROFESSOR AND ASSOCIATE DEAN FOR academic affairs at Tufts University School of Dental Medicine (TUSDM), became 2008 President of the Greater New York Academy of Prosthodontics on December 1, 2007, at a dinner meeting held at the Metropolitan Club in New York City.



Dr. Nancy Abree

Dr. Arbree is the first female president and the fourth president from Boston.

TUSDM senior Winna Goldman (D08) won the 2007 President's Award for Excellence in Dental Research from the American Association for Dental Research National Student Research Group (AADR NSRG). Her presentation, "Tumor Stroma Impact on Progression of E-Cadherin-Deficient Squamous Cell Carcinoma," was directed by Dr. Jonathan Garlick, professor in the department

of oral and maxillofacial pathology and director of the division of cancer biology and tissue engineering at TUSDM. The AADR NSRG officers selected Goldman's work as the best presentation during the Hinman Dental Meeting held in Memphis, Tennessee, in early November. The symposium is a national meeting featuring oral and poster presentations of research studies by dental students and graduate trainees from dental schools across North America.

Paul A. Levi Jr., DMD, associate clinical professor of periodontology, was named a 2007 recipient of the Fellowship Award from the American Academy of Periodontology (AAP). The annual fellowship recognizes individuals who have provided distinguished service to the AAP, which has 8,000 members. Dr. Levi has served on multiple AAP committees and is president of the nonprofit AAP Foundation, which serves the community of periodontal caregivers and patients.

### Harvard University

ON JULY 1, 2008, THE HARVARD SCHOOL OF DENTAL Medicine (HSDM) will implement a new advanced graduate program in oral implantology for individuals who have completed specialty training or have substantial professional experience. The objective of the program is to enable highly motivated individuals with proven scholarship and excellence in patient care to achieve academic leadership in the clinical and scientific fields of implant dentistry and tissue regeneration.

The two-year program combines clinical and didactic training with basic science and/or clinical research. In addition, participants will also have teaching responsibilities in both the predoctoral and advanced graduate programs at HSDM. Upon successful completion of the program, participants will receive a Certificate in Implant Dentistry. Options for obtaining an MMSc, DMSc, or PhD degree are possible for

qualified candidates given prior approval and with an additional time commitment.

The program, which will be administered by the Department of Restorative Dentistry and Biomaterials Sciences, will be interdisciplinary in nature. Faculty will include Drs. John Da Silva, German Gallucci, Vicki Rosen, and Hans-Peter Weber. Application information for the 2009/2010 academic program may be obtained at [www.hsdm.harvard.edu/asp-html/prospective-graduate.html](http://www.hsdm.harvard.edu/asp-html/prospective-graduate.html). Questions may be directed to Paula Anderson at (617) 432-1790 or [paula\\_anderson@hsdm.harvard.edu](mailto:paula_anderson@hsdm.harvard.edu).

### Boston University

FACULTY AND STUDENTS FROM BOSTON UNIVERSITY GOLDMAN School of Dental Medicine (BUGSDM) spent an afternoon on March 17, 2008, fitting young hockey players with mouthguards during the WBZ NewsRadio 1030 Youth Hockey Clinic at the TD Banknorth Garden in Boston.

Two 45-minute hockey sessions were held—one for the 6-to-9-year-old athletes and one for 10-to-12-year-old budding hockey players. Prior to each session, the young athletes visited a welcome station set up by BUGSDM that provided a fitting for a custom-made mouthguard and a goody bag with oral health supplies compliments of Procter & Gamble and Colgate.

"This was our first time participating in the event, and we were very pleased to see the fantastic turnout," says Stacey McNamee, BUGSDM director of alumni relations and the event organizer. "Mouthguards are a vital piece of equipment for all sports that include physical contact. Our participation in this event allowed us to reach out to hockey players at an early age, and hopefully it will encourage them to wear their mouthguards throughout their athletic careers."

During both private clinics, the young athletes were given the opportunity to skate with WBZ Bruins Radio Network announcers Dave Goucher and Bob Beers, plus Boston Bruins alumni Bob Sweeney and Ken Hodge Jr. ■



BUGSDM faculty, staff, and students fitted young hockey players with mouthguards at the WBZ NewsRadio 1030 Youth Hockey Clinic.

# BOOK REVIEWS



**NORMAN BECKER, DDS, EDITOR EMERITUS**

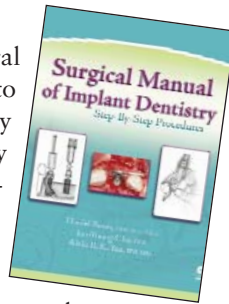
## **SURGICAL MANUAL OF IMPLANT DENTISTRY** **DANIEL BUSER, JUN-YOUNG CHO, AND ALVIN B. K. YEO**

*Quintessence Publishing*

This manual is designed for postdoctoral students and practitioners “who wish to perform surgical implant procedures in daily practice with a high degree of predictability for success and a low risk for complications.”

The book is well organized, with detailed explanations and hand-drawn illustrations demonstrating basic principles and procedures for placing implants in standard sites, as well as those with defects. It covers techniques for preparation of implant sites and bone sites, along with selection of implants by type and function. These principles are then illustrated with photographs from 14 clinical cases. These cases demonstrate both those requiring bone augmentation and those without bone grafting.

Do not get the impression that utilizing this text, even followed judiciously, will make you a complete implant specialist. Hidden in the preface are caveats such as “significant progress has been made in associated treatment protocols,” “development of bone augmentation procedures allows clinicians to correct alveolar bone defects,” and “guiding bone regeneration with barrier membranes and sinus floor elevation have become standards,” which more than imply that the text should be used as another important educational tool toward successful implant therapy.



## **ITI TREATMENT GUIDE, VOLUME 2: LOADING PROTOCOLS IN IMPLANT DENTISTRY—PARTIALLY DENTATE PATIENTS**

**DANIEL WISMEIJER, DANIEL BUSER,  
AND URS BELSER**

*Quintessence Publishing*

The International Team for Implantology (ITI) is a nonprofit academic organization of professionals in implant dentistry and tissue regeneration. The ITI consensus conferences meet at five-year intervals to discuss relevant topics in implant dentistry. For this text, the group was asked to develop evidence-based reviews on topics related to various loading protocols for dental implants.

This *ITI Treatment Guide*, the result of the last conference, is devoted to the restoration of the partially dentate patient. This volume is devoted to the findings that allow for the systematic and critical evaluation of existing knowledge as it relates to recent and perhaps controversial trends in implant dentistry.



A list of various loading protocols, as well as the methods to be used, is presented, including the edentulous mandible, the edentulous maxilla, single tooth gap, and multitooth gap. This is followed by a discussion of conventional loading, immediate loading, early loading, and esthetics factors. A classification of treatment difficulties made this section a worthwhile read.

After a chapter devoted to pretreatment assessment, the editors called upon multiple contributors to present clinical cases demonstrating the various loading procedures. This section, which uses X-rays, slides, and text, was in itself worth all the efforts needed to make this a valuable resource.

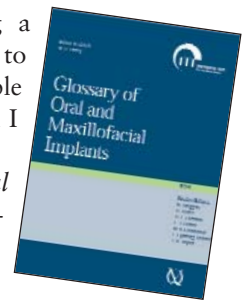
## **GLOSSARY OF ORAL AND MAXILLOFACIAL IMPLANTS**

**W. R. LANEY, EDITOR-IN-CHIEF**

*Quintessence Publishing*

Thank you, Dr. Laney, for gathering a group of section editors and coeditors to help me sound somewhat knowledgeable when I speak to the specialists with whom I am treating implant patients.

The *Glossary of Oral and Maxillofacial Implants* goes a long way toward harmonizing and making understandable the terminology employed by clinicians, educators, and researchers. With the new developments in implantology come new terms in conversation as well as in the literature. Terms such as “screw design,” “additive surface treatment,” and even “resonance frequency analysis” no longer scare me. Again, thank you. ■



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# ART OF DENTISTRY

**ERIC K. CURTIS, DDS, MAGD, ELS**

*Dr. Curtis is past president of the American Association of Dental Editors. In 2006, he received the American Dental Association's Distinguished Editor Award.*

## THE PERFECT ALIBI

THE EMERGENCY PATIENT IN MY CHAIR WAS FIDGETING NERVOUSLY. “I just need two things,” he said, as I stepped up to greet him. “First, something for the pain. And then . . .” He hesitated as I sat down and pulled on my gloves. “Could you write me a release for my boss?”

A note from the doctor never fails to work its magic. In fact, there is perhaps no better excuse from school or work than a visit to the dentist. As far back as the age of William Shakespeare, people understood the urgency of dental demands. So Iago, the villain in *Othello*, concocts this convincing cover story for nighttime skulking: “Being troubled with a raging tooth I could not sleep.” The Bard understood that dentistry is the perfect alibi.

Three hundred years later, when the nineteenth-century American dental surgeon Thomas Evans opened an office in Paris, local aristocrats flocked to his premises. It turns out that Evans’s popularity owed as much to his discretion as his dentures. As an excuse for discreet meetings or trysts safe from the prying eyes of the public, a toothache was irreproachable. Surely no one would question the legitimacy of a trip to the dentist.

These days, as any writer knows, dentistry is still the best excuse. An American Foreign Service officer in Robert Ludlum’s spy thriller *The Bourne Ultimatum* needs to sneak out of his embassy for a clandestine visit with a foreign official. He is confident of the pretext that will explain his absence: “He got up from his desk and headed for the door of his office. A suddenly remembered dental appointment would suffice.”

In Robert Graves’s book *An Ancient Castle*, a dental visit saves an innocent man from ruin. Sir Anderson Wigg, a local stuffed shirt in an English town, is insulted by the forthright Sergeant Harington and decides to have him fired from his job as warden of an old castle. When Sir Anderson accordingly accuses Sergeant Harington of drunkenly deserting his post, a call to the local dentist clears the sergeant of any wrongdoing: “Yes, of course,” the dentist says, looking at his appointment book for the time when the warden was supposed to be AWOL.

“I was pulling out an upper molar on the right jaw of a Mr. Harington.”

With an estimated half billion trips to the dentist made by Americans each year, dentistry’s modern success as the perfect alibi lies in its power to symbolize routine. Complained humorist Erma Bombeck in *Aunt Erma’s Cope Book*: “There [aren’t] any impulses left in the world anymore. Every Thursday, the beauty shop; every six months, the dentist . . .”

In the movie *Only the Lonely*, Chicago policeman Danny Muldoon (played by the late John Candy) offers a girl he is nervously trying to ask on a date a convenient excuse for refusing him. “I’ll make it easy on you,” he says. “I’ll give you a list of reasons why you can’t go with me on Saturday. All you have to do is say ‘yes’ or ‘no’ . . . you’re having your wisdom teeth pulled!”

Indeed, the “wisdom teeth” alibi is airtight. Author Salman Rushdie, hiding in Britain with an Iranian fatwa (death sentence) on his head, described his secretive life to *Newsweek*. Annoyed at false reports of his enjoying a clandestine trip to Oxford University, Rushdie revealed his true whereabouts: “For years I had needed to have my lower wisdom teeth pulled . . . One of the most impressive of the many impressive things that the police have been able to arrange in the last year was

to get me to a hospital, placed under anesthetic, have the teeth out, recover from the anesthetic, and be taken out of the hospital without anybody knowing I was there. That’s what I was doing when I was supposed to be at this Oxford high table.”

In 1993, Michael Jackson suddenly canceled three of his five concerts in Mexico City. Amid rumors of drug addiction, Jackson aides confirmed instead the real reason for the star’s disappearance from public view: He had had an abscessed molar pulled. Yet even with the perfect alibi, an ounce of prevention would have helped poor Michael. Radio ads for Madonna, also performing in the city, urged fans to “Come see Madonna. Her teeth don’t hurt.” Ouch. ■

