A Hygienist's Personal Experience with Oral Cancer
Despite the best efforts of dentists and hygienists to perform head and neck oral cancer screening exams, many oral cancers go undetected until the tumor is in an advanced stage of development. To overcome this, clinicians need to use their detective skills, beyond the typical head and neck screening exam. Discussions with the patient might reveal any unresolved areas of inflammation in the mouth and about the head and neck that could be early signs of cancer.

The June 2009 issue of Hygienetown Magazine featured Lynda Young, RDH on the cover, and her story of oral cancer. A traditional head and neck screening did not reveal her cancer. She had a persistent earache that finally sent her to the emergency room and luckily, the physician examining her remembered that an earache in an adult could be a sign of oral cancer. With only a 15 percent chance of survival, surgery, chemotherapy and a positive attitude helped her beat the odds. She lived until 2012, when she succumbed to brain cancer, all beginning with undetected oral cancer.

This month we present the story of another dental hygienist who survived oral cancer. Sandra Boody’s case was similar to Lynda, both cases undetected by the traditional oral cancer screening exams. Sandra didn’t have the earache, but she did have an unresolved upper respiratory infection and a swollen lymph node.

In retrospect, Lynda did experience a deviation of her uvula, in the direction of the tumor and a feeling of too much saliva, as the tumor pushed up, making the floor of the mouth shallower.

In addition to the traditional oral cancer screening exam, ask a few questions to determine if any simple problems seem to persist longer than usual. This might lead to earlier detection of oral cancer and better outcomes for your patients.
Dental Students Rank High with Bad Breath

Dentists lead by example. Their personal oral hygiene will be noticed by patients. To instill confidence in patients, dentists need to have fresh breath. Halitosis sends the wrong message to patients and undermines their confidence in him/her. Halitosis is linked to several oral factors: tongue coating, poor oral hygiene and dental disease. Objective measure of halitosis is done by smelling the breath and measuring sulphur compounds in the mouth air.

Researchers in the faculty of dentistry, Ankara University in Ankara, Turkey, evaluated the oral status and breath of 268 dental students. Measurements were taken between 9 a.m. and 11 a.m. and students were instructed to refrain from eating anything with a strong odor the night before and the morning of the testing. Volatile sulphur compounds were measured using a Halimeter. Organoleptic testing, or smelling the breath, was done by a trained breath tester. Oral malodor was measured using a six-point scale: 0=no odor, 1=barely noticeable, 2=slight, 3=moderate, 4=strong and 5=extremely strong odor. Tongue coating was measured using a scale from zero to 3, with 3 being two-thirds of the tongue covered with coating.

Bad breath was prevalent in these dental students, with 83 percent of males and 71 percent of females with oral malodor. Fifth-year students had higher rates of bad breath than first-year students. Tongue coating was significantly related to bad breath.

Clinical Implications: Dental students at this school need the expertise of dental hygienists for oral hygiene, better oral health and fresher breath.


The Maintenance Cost of Implants vs. Natural Teeth

Various treatments are available for periodontal disease, including debridement, surgery and implants. One question left unasked and unanswered is, “How successful was the treatment of choice based on reaching and maintaining health and financial cost?”

A private practice periodontist in Egersund, Norway, asked what the financial cost was to maintain implants compared to natural teeth. He looked back at his patients who had implants placed at least seven years before. He evaluated a group of 43 patients with a total of 847 teeth and 119 implants.

The number of disease-free years for implants following periodontal treatment was 8.44 years. Disease-free years for neighboring teeth was nine years and for contra-lateral teeth it was 10 years. The incidence of peri-implantitis within the group was 53 percent, the same was true for natural teeth, 53 percent experienced periodontitis. Since there were so many more teeth than implants, the incidence of disease was 31 percent at the implant level and eight percent at the tooth level.

The high incidence of peri-implantitis led to the need in some cases for surgery around an implant. Two implants were lost, one after 13 years and the other after 22 years. After various calculations the cost of maintenance treatment was determined to be $13.58 (10.2 Euro) per implant per year and $2.66 (2.1 Euro) per tooth per year.

Clinical Implications: Natural teeth are still the best option, kept healthy and free from disease with daily care and professional maintenance.

Asthma Related to Reduced Saliva Flow and Increased Oral Bacteria

Asthma is a serious childhood disease that is on the rise. The prevalence of allergies, including asthma, has reached 41 percent of children in Western countries. In Saudi Arabia the rate is lower, but increasing due to contemporary lifestyle, cigarette smoking and indoor pets. Asthma medications taken orally or inhaled change the salivary flow rate and pH of the oral cavity, leading in some cases to increased caries and gingivitis.

Researchers at King Abdulaziz University in Jeddah, Saudi Arabia, compared medical histories and oral conditions between 30 children with asthma and 30 healthy children. Saliva was tested for flow rate and buffering capacity.

Sugar consumption was high among these children, with 38 percent eating sugar more than three times a day and 36 percent eating sugar two to three times per day.

No significant differences were found between groups for decayed, missing or filled teeth or surfaces. The differences observed were for the numbers of cariogenic bacteria in the mouth and salivary flow and buffering rates. Asthmatic children had higher levels of *Strep mutans* and *Lactobacillus* bacteria in the mouth compared to healthy children. Children with asthma taking steroids or anti-asthmatic medications had even higher levels of *Strep mutans* and *Lactobacillus*. The more frequent the medications were taken, the higher the oral bacterial levels. Saliva flow rates and buffering capacity were lower for children with asthma compared to healthy children.

Clinical Implications: Asthma and caries are the two most common childhood diseases. Watch for increased caries risk factors in children with asthma.


Chlorhexidine Varnish Reduces *Strep Mutans* Counts

Dental caries is a complex disease influenced by many factors. Fluoride has been used for decades to impact tooth enamel, with fluoride varnish now the primary choice for professional treatments. Chlorhexidine rinses and gels are used to control bacterial levels. Chlorhexidine varnish is a new product that addresses the undesirable side effects of the rinse, while producing the desired reduction in *Strep mutans*.

Researchers in India compared Cervitec chlorhexidine varnish from Vivicare with Duraphat fluoride varnish from Colgate in a group of 50, seven- to eight-year-old children. The study focused on the pits and fissures of mandibular permanent first molars. These surfaces are not fully mineralized at eruption, putting them at high risk for tooth decay.

Children were instructed to refrain from toothbrushing for 24 hours prior to examination. Plaque was stained with disclosing solution and then removed from the occlusal surfaces of both mandibular first molars. Plaque samples were again collected at the end of one and three months.

After baseline plaque removal, the assigned varnish was applied. Each child then returned for two additional varnish applications at day five and day 10. *Strep mutan* levels were measured in the laboratory. Both groups had similar bacterial levels at baseline. At one month, the Cervitec varnish group showed a significant reduction in *Strep mutan* levels. No change in the Duraphat varnish group. At three months, the Cervitec varnish group still had *Strep mutan* levels at half that of the Duraphat varnish group.

Clinical Implications: Chlorhexidine varnish provides a preventive option when reduction in *Strep mutans* is desired.

In 2012, researchers convened in Segovia, Spain, for a workshop on the oral-systemic link. An introductory article set the stage for these discussions by summarizing the mechanisms of infection, inflammation and the inflammatory response as they might relate to the movement of infection from the mouth to other parts of the body.

Periodontal disease is considered metastatic in that bacteria and inflammatory cytokines can be moved to distant parts of the body, creating disease in another organ or body part. Periodontitis has been shown to have an impact on systemic inflammation as well.

Periodontal disease is triggered by a bacterial infection that triggers an inflammatory response that causes damage to bone and connective tissue. Not everyone with periodontal pathogens in their mouth develops periodontitis; the host must be susceptible.

Although a periodontal infection appears to be localized, it can spread throughout the body. A healthy sulcus will prevent bacteria from entering the underlying tissue and the circulatory system. Severely inflamed pocket epithelium provides easy access to underlying tissues and the circulatory system for the oral bacteria. Toxins also easily enter the blood stream from an infected pocket. Chewing, toothbrushing, probing and endo treatment further enhance this transfer.

Pro-inflammatory mediators are secreted in response to bacteria and bacterial toxins dispersed from the mouth to distant locations and organs. A cascade of inflammatory reactions occur as oral bacteria and associated proteins reach these distant sites.

It is clear that periodontal disease is linked to many other systemic conditions, but cause and effect evidence is elusive.

**Clinical Implications: Understanding the concepts of infection and inflammation provide a basis for relating to the oral-systemic link.**


**Clinical Implications: Use a desensitizing prophylaxis paste for patients experiencing dentinal hypersensitivity.**

In 2001, at age 47, Sandra Boody was diagnosed with stage four, squamous cell carcinoma of a left neck lymph node and the base of her tongue. At stage four, it was inoperable. This was considered an “out-of-the-box” diagnosis, since Sandy had no risk factors. She didn’t smoke or drink alcohol and was not HPV positive, the usual risk factors. She also wasn’t a middle-aged male. Leading up to this diagnosis, Sandy suffered repeatedly from severe upper respiratory infections, sinus infections and a horrible case of the flu. At the time, multiple lymph nodes were swollen on both sides of her neck and some ulceration of the tissue at the base of the tongue was noted by the ear, nose and throat (ENT) specialist. Actually, she saw several ENTs as her health never returned to normal. Sandy’s request for a needle biopsy of the swollen lymph node on the left side of her neck, which had not returned to normal, was denied by more than one ENT. She didn’t fit the usual profile for cancer, so why bother doing the biopsy. Eighteen months later, after multiple rounds of antibiotic therapy, sinus radiographs that showed nothing, and constant, extreme fatigue, Sandy proactively referred herself to the Head and Neck Cancer Center at the University of Pittsburgh. The department head at the Head and Neck Cancer Center performed a surgical biopsy and delivered the devastating diagnosis.

Treatment included daily external beam radiation therapy with concurrent weekly chemotherapy for a treatment time of eight weeks. She also underwent brachytherapy, an internal, sealed source radiotherapy plus surgically inserted catheters into the tumor and lymph nodes. The combination of these treatments all contributed to severe xerostomia. The treatment protocol was an extreme attempt to save her life. As terrible as the treatment was, Sandy is thankful that it worked and that she has been cancer free for 11 years.

Xerostomia is the most common, interruptive side effect of cancer treatment. Because normal as well as cancerous cells are destroyed, the side effects range from acute to long lasting. In some cases the xerostomia is so severe, patients have to stop cancer therapy due to this painful side effect. Sandy has suffered with severe xerostomia since undergoing therapy. Her daily oral hygiene routine has changed over the years, as new products are brought to market. Her personal experience provides dental team members with insights to help them care for patients before, during and after cancer treatment. We interviewed Sandy to determine the differences between oral hygiene care then and now.

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Sandy, thank you for taking time today to answer questions about your personal experience with oral cancer. Being a dental hygiene educator, when you were diagnosed did you think you already knew what oral care protocol would work for you?

Sandy: When I was diagnosed, the most common recommendation was custom fluoride trays. Back then, most dental professionals were just making fluoride trays and giving out samples of dry-mouth products. This is what I was teaching because it was the standard of care back then. When diagnosed, I made the trays for myself immediately and fully expected to use them for fluoride applications. I was surprised to find that the fluoride gel application was difficult to tolerate. The taste was unbearable and the viscosity of the gel caused gagging. Fluoride gel is very uncomfortable on inflamed, xerostomic tissues.

Now, I teach the making of custom oncology trays to deliver oral moisturizing gels and remineralizing products, not fluoride gels. Fluoride varnishes have replaced tray delivery of fluoride. One of the new uses for the trays when worn overnight is to protect sensitive mucosa. I was surprised to learn that my own teeth became weapons of mass destruction against my dry, sensitive mucosa. Sharp edges and cusp tips can easily tear and cut mucosa inside the cheeks and lips; especially sharp are the cusps and premolars. The oncology trays provide mucosal protection from dangerously sharp tooth surfaces.

What was your oral care routine when you began this journey?

Sandy: A decade ago, I used the fluoride trays and used over-the-counter dry-mouth toothpaste, dry-mouth oral rinse and dry-mouth gels. I also rinsed with sodium bicarbonate and used various moisturizing lip balms. Nothing was really helpful back then. Things have changed a lot in just the past few years.

What is your oral care protocol today?

Sandy: Today, my oral care protocol focuses on elevating my oral pH and protecting both my soft tissues and teeth. I use a small-headed, soft-bristle toothbrush. Several brands advertise them as “sensitive” toothbrushes. I do prefer a power sonic toothbrush on a low setting. I use an SLS-free toothpaste and extra fine dental floss. For a rinse, I use a prescription brand called NeutraSal Rinse, a super saturated calcium phosphate rinse. I use this rinse morning, evening and after meals.

During the day I chew xylitol-sweetened gum. At the moment, MightyFlow Green Tea moisturizing gum is my favorite. Prior to lecturing and throughout the day I use MedActive Oral Relief Spray.

In the evening I brush with a prescription-level fluoride paste, rinse with NeutraSal and wear the oncology trays filled with MI Paste Plus. I also use Spry Nasal Spray and MedActive Oral Relief Spray on my tongue.

For daily comfort, I have to carry products with me wherever I go. I really thought I’d find one line of products to take care of all the dry-mouth and demineralizing problems, but instead it’s a lifetime of using multiple products to get through the day. And my personal protocol changes as new products are introduced.

What are your recommendations for dental teams faced with patients undergoing cancer treatment?

Sandy: Here are my top ten general recommendations for treating patients prior to, during and after cancer treatment:

2. Evaluate the dentition and remove rough surfaces and sharp cusps to reduce potential tissue trauma.
3. Advise patients wearing full and partial dentures that they are at risk of tissue trauma and candida albicans infections.
4. Provide detailed self-care instructions using specific, simple aids, including the use of over-the-counter products, (e.g., explain how to apply gel to the teeth, tissues and tongue).
5. Replace and restore faulty restorations before cancer treatment and place sealants to prevent caries and enamel washout, also any needed periodontal therapy.
6. Create printed instructions including websites providing information on oral health care and in-depth oral hygiene instructions. Include instruction for a daily self-check for soft-tissue lesions, sore spots and inflammation that should be reported to the oncologists.
7. Minimize enamel and dentin breakdown with monthly fluoride varnish applications and sealant applications.
8. Tell them to strive for five xylitol exposures each day, using xylitol-sweetened gums, lozenges, pastes, rinses and sprays in their daily routines. Also have them check the pH of oral care products they use, including rinses.
9. Address the fact that altered taste sensations make it hard to chew and swallow food by recommending neutralizing rinses, sprays and gels that coat and moisturize the oral tissues.

10. Advise patients to avoid foods that are spicy, crunchy and sugar-laden, and consult an oncology nutritionist for a list of foods to avoid.

You lecture to dental professionals all over the country. What do your audiences take immediately back to their practices?

Sandy: My full-day courses are packed with information, but the two changes most likely to be implemented when attendees return to their offices are using a written protocol and fluoride varnish applications. I hear back from those who attend my lectures that they actually write up a protocol, print it out and give it to patients. They also schedule their patients undergoing cancer treatment for monthly fluoride varnish applications. These applications begin before treatment, and continue through and after cancer treatment.

Any last advice for clinicians?

Sandy: We are entering a new era in dentistry and oncology with new products supported by research. The medical community is beginning to embrace the oral-systemic connection. They are now looking to us to help them navigate the difficult course of treatment for patients with teeth, implants and restorations. The educated consumer is proactive and interested in preserving their dentition and their dental investment. A very exciting future is ahead!

Bios

Cindy Kleiman is an international speaker on care of the medically complex patient and medical emergencies in the dental practice. She can be reached at: cindy@cindyspeaking.com.

Sandra Boody is a graduate of the University of Pittsburgh with experience in clinical practice including dental, hospital and nursing homes, education, curriculum development, corporate sales and myofunctional therapy. She also speaks on a variety of topics relating to the oral health of those undergoing cancer therapy. Sandra can be reached at sandraboody@gmail.com.

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