Caring for the Oral Health of Patients Battling Cancer

Part I: Oral Care Before Cancer Treatment

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The following is the first of a three-part series addressing various forms of oral health therapy that ideally should be addressed before, during, and after cancer treatment. This segment focuses on oral health care needs before the commencement of cancer treatment.

Cancer. The New Oxford American Dictionary defines it as “the disease caused by an uncontrolled division of abnormal cells in a part of the body;” but for the millions of people it has touched, cancer is so much more. Cancer is a constant unwanted companion that opens the door to an unchosen journey and demands to be followed. It affects individuals, families and friends. Cancer changes lives.

Beyond the emotional toll it imposes, cancer alters the well-being of those it afflicts. Modern treatment regimens given to combat this disease come with a host of deleterious side effects, many of which occur in the mouth. Dentists, dental hygienists and dental auxiliaries are in a unique and necessary position to make a positive impact in the lives of patients battling cancer.

Making a difference begins with a desire to help and a willingness to take a risk. It is followed by a commitment to learn about the unique oral health care needs of patients engaged in the fight of their lives and put into practice skills that can literally provide comfort and hope. We, as dental professionals, can and should be a part of a comprehensive cancer care team for an ever-growing number of people facing cancer.
Dental Oncology

Dental oncology is a focus of dentistry dedicated to meeting the unique dental and oral health care needs that arise as a result of cancer therapy. It is an area of oral medicine devoted to improving the well-being and quality of life of people battling cancer. Dental oncology goes beyond the scope of general dental treatment to include management of the soft tissues of the mouth and care for oral side effects specific to cancer therapy. A dental professional knowledgeable in dental oncology plays an important role throughout cancer treatment by preventing and managing mouth sores, dental needs, oral pain and infections. As a member of the patient’s oncology care team, the dental professional communicates directly with the medical oncologist, radiation oncologist and other team members to provide optimal comprehensive care before, during, and after cancer treatments.

Ideally, a patient's relationship with a dental professional begins as soon as possible after receiving the diagnosis of cancer. Most of the present-day treatments for cancer involve the administration of cytotoxic drugs, radiation, myelosuppressive treatments or some combination thereof. Having a baseline assessment completed before the implementation of immunosuppressive therapies allows the dental professional to have a pre-treatment reference point to compare oral and systemic health at future visits.

For the newly diagnosed patient with cancer who has not received regular dental and oral health care, a prompt visit to the dentist's office also allows for immediate attention to unaddressed periodontal issues and unresolved dental needs before immunosuppression begins. During cancer treatments, bacterial components of calculus, dental plaque and oral biofilm can easily become vehicles for bacteremia or oral infections. Properly addressing these oral health concerns at this pre-treatment stage can prevent or significantly reduce the severity of oral issues that could complicate or even interrupt the patient's cancer treatment schedule.
**Oral Health Care Before Chemotherapy**

Chemotherapy is the treatment of choice for a wide range of cancers. It can be used either alone or in combination with other treatment modalities. The goal of chemotherapy is to eradicate the rapidly dividing cancerous cells, but unfortunately these drugs often cannot differentiate between cancer cells and other types of cells that divide rapidly under normal conditions within the body. These cells include bone marrow, hair, and the mucosa of the entire gastrointestinal tract, including the mouth. It is the direct cytotoxic effect of the drugs as well as side effects that can cause intraoral complications. Because chemotherapeutic agents are used to combat cancers of all types, the dental professional is needed to care for patients with most kinds of cancer, not just malignancies relevant to structures within the head or neck.

Optimally, the patient should see a dental professional well enough in advance so that all dental procedures can be completed one week before beginning chemotherapy. At a minimum, dental procedures that might introduce bacteria into the bloodstream should be completed in this timeframe. Close communication with the medical oncologist is of paramount importance as each member of the oncology team needs to be aware of the scheduling of all care related to the patient. Communication should include a summary of the present oral health of the patient, a treatment plan of essential dental care, and an anticipated timeline of when that care can be completed. The dental professional should also confirm that the medical colleagues on the oncology team understand the nature of anticipated oral complications during treatment and be prepared to function as the expert able to address those oral health issues.
Dental management before chemotherapy should include a thorough baseline dental and periodontal assessment with close attentions paid to conditions that could be problematic during times of immunosuppression. Preemptive measures should be taken to correct or remove any possible sources of oral trauma. These might include broken teeth or ill-fitting existing restorations or prostheses. Non-restorable teeth that pose an infection risk in the short term should be extracted. This would include any tooth affected by severe periodontal disease or deemed to be of endodontic concern. Partially-erupted third molars should be evaluated and be extracted if they are at risk for pericoronitis. A thorough dental prophylaxis including scaling and root planing must be completed. Decreasing the existing intraoral bacterial load is one of the best preventive services that can be performed for the patient scheduled to undergo chemotherapy. Carious lesions and tooth-born fractures should be restored. Resin modified glass ionomer is a good restorative material choice for these patients as xerostomia is anticipated during cancer treatment. Any orthodontic bands and wires should be removed and orthodontic treatment postponed until cancer treatment is completed. Oral hygiene instructions should be reviewed, even for regular dental patients. Educating about possible or anticipated oral issues and reassuring the patient and the family they are not alone in this battle builds confidence and strengthens the dental professional/patient relationship.

**Oral Health Before Head and Neck Radiation Therapy**
Radiation therapy is routinely used to treat tumors in the head or neck, often in combination with chemotherapy or immunotherapy. Head and neck radiation, unlike radiotherapy in other parts of the body, creates issues of particular concern for the dental professional. Patients undergoing head and neck radiation therapy often experience permanent life-changing side effects from their cancer treatment. Understanding these complications at the pre-treatment assessment positions the dental professional to be of the most service.

The pre-treatment assessment appointment for the patient undergoing head and neck radiation begins with a full-mouth series of radiographs. A clinical examination including complete periodontal charting must be combined with the radiographic evaluation to assess periodontal condition, to diagnose periapical pathology and to identify teeth requiring immediate attention. All possible sources of intraoral trauma must be
resolved. Because trauma to irradiated bone poses a risk for osteoradionecrosis, the dental professional must evaluate the current condition of the teeth and periodontium and anticipate the patient’s ability to maintain meticulous oral hygiene for the remainder of his or her life, often in challenging intraoral conditions. All non-restorable teeth should be extracted. Those teeth with moderate to severe periodontal disease and partially-erupted third molars within the anticipated field of radiation should also be removed. Other teeth in the planned field of radiation should be evaluated in light of the patient’s current hygiene status and dental history, the presence of high-risk deleterious habits or co-morbidities (e.g. smoking and diabetes mellitus), the patient’s commitment to regular professional dental visits, and the risk of osteoradionecrosis. Any decision by the patient to refuse to comply with the dental professional’s recommendation should be well-documented in the patient’s chart. All remaining teeth must be thoroughly cleaned. Dental impressions should be taken from which fluoride trays can be fabricated for the patient’s at-home use. The dental professional should counsel the patient and his or her family concerning the anticipated complications of head and neck radiation therapy and the life-long changes that must be made in oral health care.

Communication between the dental professional and radiation oncologist is extremely important. The dentist should understand the anticipated scheduling of radiation treatments and must know the amount of radiation planned for each of the jaws. Similarly, the radiation oncologist should be aware of all necessary dental treatment and the anticipated timeline to complete it. The timing of dental surgery is of utmost importance: at least 14 days should be available for healing following any surgery before radiation therapy commences. The dental professional should understand that tumors of the head and neck are often times fast moving and require expeditious treatment. Every effort should be made to accommodate head and neck patients for treatment as soon as possible. There are times, however, when the nature of the tumor may be such that radiation therapy must be initiated immediately and not allow adequate time for dental work to be completed. In these cases, dental care should be postponed until the completion of radiotherapy and the patient has sufficiently recovered. Dental care should be avoided while the patient is undergoing radiation therapy, but should be completed as soon after radiotherapy as possible since bone changes associated with radiation worsen over time.
ORAL HEALTH BEFORE BISPHOSPHONATE THERAPY

Bisphosphonate therapy is used extensively in patients with metastatic bone disease. These drugs, which include Zometa® (zoledronic acid) and Aredia® (pamidronate), are administered intravenously through a portacath. They fall into a unique class of drugs that are characterized by their affinity for bone and the ability to inhibit bone resorption through decreased osteoclastic activity. Because they limit bone turnover, these drugs have been implicated in osteonecrosis following dental surgery subsequent to bisphosphonate therapy. Drug potency and accumulation seem to be important factors in assessing whether or not a patient is at risk for developing bisphosphonate-related osteonecrosis of the jaw.

If non-restorable teeth exist in a patient who will be undergoing bisphosphonate therapy, they should be removed at least 14 days before the introduction of the drug, if possible. Partially-erupted third molars and teeth with moderate to severe periodontal disease should be considered for extraction. Precautions similar to those for patients undergoing head and neck radiation should be considered in evaluating teeth for possible extraction as the half-life bisphosphonates can exceed ten years. All dental professionals should be aware that a history of bisphosphonate disclosed in a medical history should be carefully considered and evaluated to assess the risk for bisphosphonate-related osteonecrosis of the jaw.

CANCER IN THE UNITED STATES TODAY

According to the North American Association of Central Cancer Registries, the estimated new cancer cases in the United States in 2011 was approximately equivalent to the population of the entire state of Idaho. From the same source, the estimated number of U.S. deaths in the same year approximated the population of the entire state of Wyoming. It is important to note that these are annual numbers. Currently, approximately 12 million people in the United States are living with cancer. This number does not include cancer survivors considered cancer-free. In 2010, the national cost for cancer care in the US was over $124 billion. That number is expected to more than double, and possibly triple, by the year 2020.
Cancer is a significant healthcare concern in the United States and around the world. As the Baby-Boomer generation continues to age, the incidence rate in the United States is expected to increase. Cancer treatment has evolved from a required visit to one of just a few major national cancer centers to care that can be received close to home. With more and more local cancer treatment centers, there is a greater need for local dental professionals to become an integral part of oncology teams and provide the care that these patients so desperately need.

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Dr. Abbott has most recently conducted studies focusing on bisphosphonate-related osteonecrosis of the jaw and xerostomia in patients with cancer. He is the previous recipient of the Dentist Scientist Award and the National Research Service Award, both granted by the National Institutes of Health. Dr. Abbott has been a visiting faculty lecturer for the University at Buffalo School of Dental Medicine continuing education program and has lectured throughout the United States.