

## **Bio of Dr. Robert Wood, Yvette Whyte**

**Rina Steuerman** spent more than 30 years in the hectic hotel and media industries before being diagnosed with Lung Cancer in the fall of 2004. Today she is a lung cancer survivor and volunteer at Lung Cancer Canada. She also acts as a consultant to companies designing corporate promotional and advertising campaigns.

**Robert (Bob) Wood** is the Head of the Department of Dental Oncology, Ocular and Maxillofacial Prosthetics at the Princess Margaret Hospital. He has been treating patients that are medically compromised for 25 years. Dr. Wood is an Associate Professor at the University of Toronto.

**Yvette Whyte** is an Advanced Care Level II dental assistant who has devoted the past 13 years of her career to oncology patients. She has managed dental/oral care for oncology patients and addressed the complex oral health needs of medically-compromised and under-serviced patients. Yvette is employed at Princess Margaret Hospital.

## **EDUCATION IS PREVENTION: Introduction by Rina Steuerman, Lung Cancer survivor and patient at Princess Margaret Hospital (PMH) Dental clinic.**

*When I was first diagnosed with Lung Cancer in 2004 I did what I expect most people in my situation do. I found a way to go on with all the tests and procedures, the surgery, the chemotherapy.*

*The last thing I expected when I was finally on the other side of chemo was to find myself in a dentist's chair being told I would be losing all my teeth due to gum disease exacerbated by the chemotherapy that saved my life.*

*Luckily, through my oncology team at Princess Margaret Hospital, I found myself referred to the Dental Clinic at PMH for a second opinion. Through the expertise and resources of the caring professionals at the PMH Dental Clinic, I'm the recipient of five dental implants. The rest of my teeth were saved.*

*The experience made me realize I did not know enough to prevent serious dental difficulties after a cancer diagnosis and treatment. I suspect most cancer patients find themselves in my situation.*

*Thanks to Dr. Robert Wood and the clinic, we can educate and empower cancer patients with the knowledge to prevent dental complications. Education is prevention. One important step along the cancer journey.*

## **LIFE FIRST, THEN TEETH**

When you are diagnosed with lung cancer it is important to know how your therapy may affect or alter your dental treatment. Radiation and surgical issues are understood by patient and dentist alike and dental treatment can be modified or delayed accordingly. Chemotherapy however changes all the rules. If chemotherapy causes a reduction in a patient's ability to fight infection or predisposes them to hemorrhaging then all the rules change. Sources of infection must be removed on an urgent basis.

It is important to be treated by a dentist who is comfortable treating cancer patients and understands the consequences of treatment in relationship to the cancer.

Dentists should be aware of the signs of lung cancer – ie: coughing, wheezing, shortness of breath, coughing of blood (Haemoptysis), chest pain, shoulder pain on the outside of the arm (Pancoast syndrome), hoarseness, or constitutional changes – weight loss, fatigue, weakness, depression. See:

[http://www.medicinenet.com/lung\\_cancer/page4.htm](http://www.medicinenet.com/lung_cancer/page4.htm)

Although these symptoms are particular to smokers, dentists should be aware that non-smokers get lung cancer too. In a recent Toronto study of delay in diagnosis of patients with mouth, throat and larynx cancers (upper aerodigestive tract cancers), female patients and those patients that did not smoke took longer to diagnose than those patients who smoked.

Patients should discuss scheduled oncology treatments with their dentist and ask for a complete dental and x-ray examination to identify and definitively treat sources of dental infection prior to undergoing chemotherapy.

Lung surgery or bronchoscopy may include manipulation of instruments around the front teeth so it is imperative that the teeth themselves are in good shape, have sound gum support and solid fillings. This can prevent inadvertent damage to the front teeth during bronchoscopy or during intubation for general anesthesia.

In the post-operative phase it is prudent not to schedule lengthy appointments. You may not be able to tolerate them.

### **Dental treatment after diagnosis.**

If diagnosed with lung cancer, patients should make an appointment with their dentist as soon as possible and arrange for a full set of x-rays (radiographs) , a complete dental and periodontal examination to look for and definitively treat the following:

1. abscessed teeth
2. failed root canal treatment
3. partially impacted wisdom teeth
4. clinically significant periodontal disease
5. cavities that are amenable to restoration
6. cavities that are not amenable to restoration should be treated with root canal or extracted
7. removal of all sources of irritation such as poorly-fitting dentures

Root canal treatment should be completed prior to chemotherapy.

Bridge-work should be completed prior to chemotherapy, if practicable, however it can most often be delayed until after chemotherapy or be staged in a fashion so as to complete it at appropriate points in the chemotherapy cycle.

Some chemotherapy regimens ([see table](#)) may have an effect on blood cells The dentist must consider the platelet count, the hemoglobin level (which measures the blood's oxygen-carrying capacity), the nature of the dental procedure, concomitant medical conditions, and other medications such as blood thinners that the patient may be on.

If chemotherapy lowers the white blood cell count or the platelet count is low it is prudent to avoid anything that would cause hemorrhage or blood-borne infection. One of the worst things to do for a patient with a low platelet count is a dental cleaning. Scaling can cause multiple points of hemorrhage that are not readily controlled. Supra-gingival scaling - scaling above the gum line - can often be done as can a polishing if done carefully. Sub-gingival (below the gum) scaling and curettage of the gingival should be avoided until blood counts are normal.

Alterations in oral hygiene habits or dental care delivery need to be implemented. It is crucial to maintain excellent oral hygiene - brushing and flossing especially well. If a patient is not particularly skilled at flossing it is important not to snap the floss through the teeth and damage the gums causing unnecessary bleeding.

Patients should switch to a soft or ultra-soft toothbrush from a hard or medium bristle one. The toothbrush should be stored in a bathroom cabinet. Flushing toilets can cause aerosol dissemination of germs throughout the bathroom. Ideally, a toothbrush should be kept in a ziplock bag or in a medicine cabinet to prevent airborne particles from infecting the brush. Finally – patients should buy a new brush periodically – they wear out frequently.

Many patients on chemotherapy cannot tolerate toothpastes that contain “minty” flavoring agents because they burn the soft tissues of the mouth. Toothpastes such as Biotene or even baking soda can be used instead. If a person cannot tolerate toothbrushes or is so fatigued that routine dental hygiene is not possible, toothettes and Peridex / chlorhexidine gluconate oral rinses are a stop-gap measure for plaque control. Chlorhexidine stains the teeth but this stain is readily removed by the dentist.

### **Some questions to ask the dentist.**

Are you comfortable treating me?

Do you have other cancer patients in your practice?

Do you want a copy of my recent blood counts (if on chemotherapy)

If I am short of breath can we take breaks from time to time so I can catch my breath?

### **Things you can do to help your dentist care for you**

Let your dentist know if you are short of breath or require special breathing apparatus. Many dental offices have supplemental oxygen if needed. Let your dentist know if you have special oxygen needs and ask if you can bring your own nasal prongs.

Let your dentist know if any recent surgical procedures have made certain body postures uncomfortable. Most dental offices will have cushions or pillows to place around your neck or back to make the chair more comfortable.

If you are on chemotherapy it is best to delay elective treatment. If you need urgent dental treatment obtain a recent copy of your blood results from your oncologist and take them to your dentist. Your blood results should include the normal reference range or if critical low counts can be flagged. It is prudent to confirm with your oncologist that it is permissible to undergo routine dental treatment. There is always a balance between risk and benefit in any procedure so you have to decide whether the benefit is worth the risk. In an emergency situation the balance shifts towards benefit and away from risk. Curiously things that may seem invasive and risky to patients are different from those that actually are. For example root canal treatment may be viewed as invasive but is generally not problematic - especially if undertaken by a specialist -

whereas scaling and cleaning of teeth might cause extensive hemorrhage and predispose a patient to systemic infection.

## **SIDE EFFECTS OF TREATMENT**

### **Mucositis**



What is it?

Mucositis is inflammation of the lining of the oral cavity and throat. It is caused by some chemotherapy agents and in cases where the oral cavity is included in the radiation field, which it virtually never is in lung cancer – by radiation. Esophagitis is mucositis that occurs in the esophagus as a consequence of radiation and chemotherapy. It is analogous to mucositis.

What causes it?

Cells lining the mouth and upper aerodigestive tract are rapidly dividing and re-populating ones. Chewing and swallowing food and wear and tear on this part of the body requires cells to be regularly replenished. This rapid repopulation is a trait that normal mouth-lining cells share with tumor cells. Generally rapidly dividing cells are more sensitive to chemotherapy agents. Certain types and courses of chemotherapy target rapidly-dividing cells and prevent these normally rapidly dividing cells from replenishing themselves. The net result is ulcerative sores.

Why is it important?

Mouth sores of mucositis are clinically important because they are painful and they may, in extreme cases, result in a “barrier-loss” to the bacteria present normally in the mouth. The mouth is one of the most bacteria-filled sites on the human body and if the barrier is lost then colonization can occur.

What to do about it?

There are no completely effective means of treating mucositis. Many agents have been tried and some work in small studies. The dental clinic at the Princess Margaret Hospital along with the University of Toronto and other departments at the Princess Margaret Hospital are studying new ways of measuring mucositis and are working with partners in industry to test a novel non-toxic topical agent in other cancer groups where mucositis occurs 100 per cent of the time. Currently treatment is directed at helping the patient cope via changes to their diet, use of systemic and topical analgesics, and minimizing trauma to the oral cavity. Mucositis is self limiting and patients will recover when the chemotherapy is stopped.

### **Bacterial / Fungal and Viral oral Infections**



What are they?

These groups of infections are caused by bacteria, fungi and viruses respectively. The mouth harbors a very large number and type of microbes. A normal patient can happily co-exist with these however immunosuppression or even the stress of fighting cancer can provide a milieu where they can grow and invade.

What causes these?

An example of a bacterial infection would be a dental infection caused by streptococci. These bacteria are common in dental infections associated with abscessed teeth - a common fungal infection in those receiving chemotherapy. This causes dry cracking of the corners of the mouth, white deposits on the mucosa that are readily scraped off, or bright red soreness of the throat (thrush). Viral infections can include shingles, caused by the chicken-pox virus or herpes simplex type I caused by the herpes virus. A large number of infections occur with far greater frequency in the cancer patient.

Why are they important?

Bacterial infections by and large can be prevented prior to their occurrence. However they cannot be easily fought off in patients with diminished white blood cell counts. Fungal infections are common in cancer patients whereas viral infections are less common but can lead to serious problems such as post-herpetic neuralgia.

What to do about it?

Bacterial infections can be managed by judicious use of antibiotics. Prevention however is always better. If dental abscesses occur, the teeth must be treated or removed between chemotherapy cycles. The best time for this should be determined by your oncologist and dental oncologist but is usually just prior to the next cycle of chemotherapy. Fungal infections such as *Candida albicans* infection can be treated with topical or systemic agents. Viral infections although uncommon may also be treated with anti-viral agents such as acyclovir or ganciclovir. Treatment must be instituted promptly so as not to delay anti-cancer treatment.

**Dry Mouth (Xerostomia)**



What is it?

Simply put, xerostomia is dry mouth. It is dryness of the mouth that is clinically significant to the patient and may be temporary or permanent.

What causes it?

Xerostomia is common with head and neck treatment however radiation treatment for lung cancer does not cause this side effect. Many medications used for cancer treatment and for other associated conditions cause temporary xerostomia.

Why is it important?

Dry mouth pre-disposes patients to cavities. If the dry mouth is prolonged this predisposition to cavities can result in the development of large numbers of cavities and eventually loss of all the teeth. Additionally it is difficult to taste food unless the food is dissolved in saliva. Dry mouth may affect a patient's ability to taste and makes eating less pleasurable. The authors often advise patients with transient xerostomia to consider food as fuel – not fun during this period.

What to do about it?



The symptoms of xerostomia can be treated with salivary stimulants such as pilocarpine however pilocarpine treatment is associated with side effects. Salivary substitutes can be used during this time and most people elect to carry a small bottle of water. At night saliva flow usually diminishes – even in the normal patient. Salivary lubricants can be used as can small quantities of vegetable oil. Xerostomia-related dental caries (cavities) can be prevented by scrupulous attention to oral hygiene and by using high-fluoride containing toothpastes such as Colgate’s Prevalent.

## **Dysgeusia**

What is it?

Dysgeusia is a diminishment or alteration in a patient’s sense of taste.

What causes it?

The symptom of dysgeusia is likely an interplay of various factors. It may be a side effect of chemotherapy agents, be partially the result of dry mouth, be worsened by nausea or vomiting or even exacerbated by feeling generally unwell.

Why is it important?

Dysgeusia is important because when it is present the patient may not have the desire to eat. In other cancer patients - such as those with head and neck cancer - food may taste metallic, or like cotton wool. When this occurs, especially in the presence of nausea and malaise, it turns off a patient’s desire to eat and ultimately can result in a lack of adequate liquid and food intake. This is troubling since the oncology patient needs to maintain body mass in order to fight their disease.

What to do about it?

Dysgeusia and the problems that occur as a result require the expertise of a dietician. Most cases are self-limiting and symptoms end when treatment ceases. Often patients have to be counseled that during treatment periods they should view food as “fuel” rather than as a pleasurable experience. It is important to “fuel-up” for the fight and not lose body mass.

## **Tissue and bone loss**



What is it?

Tissue and bone loss refers to the loss of both hard and soft periodontal tissues. The periodontal tissues are those that support the teeth. When these tissues are lost, the teeth become loosened, may be prone to periodontal abscesses and ultimately the teeth are lost.

What causes it?

Gingivitis and periodontal disease are, with a few exceptions, diseases of neglect. **Interestingly periodontal disease is directly related to smoking.** Loss of support bone is not always an age-related phenomenon but incremental support loss can be exacerbated by bouts of chemotherapy where immunosuppression, fatigue and reduced platelet counts cause episodes of radically diminished oral hygiene practices.

Why is it important?

Once periodontal bone is lost it is virtually impossible to regain so maintenance of what a patient presently has is important. Additionally, natural teeth are superior to denture teeth for chewing and nutrition. Each loss of a functioning tooth means that the rest of the chewing work needs to be shared by the other teeth. The stresses of biting and chewing are best spread over a large number of teeth rather than a few. Loss of support tissues leads to lost teeth, decreased chewing efficiency, difficulties eating and occasionally problems with speech and cosmetics.

What to do about it?

Prevention is the key to maintaining adequate support tissues. Scrupulous home care coupled with regular check-ups and scaling is the key to maintaining a sound dentition. In most instances bone loss can be detected by periodontal probing however routine radiographs will also assist the dentist to assess the periodontal support bone level. Additionally examination of the gingival (gums) will allow appropriate periodontal therapy to be instituted. Most of the time conservative oral hygiene measures such as scaling and root planning suffice but occasionally periodontal surgery is required. Any surgical procedure should be done only when a patient has not been on any chemotherapy and their blood counts normalized. **Some patients prescribed bone-hardening drugs for osteoporosis (and more and more frequently for cancer) should be aware that these drugs may cause a problem with healing from periodontal surgery, extractions, and even implant surgery.**

### **Cosmetic dentistry, implant dentistry, Fixed and removable prosthetics**

Cosmetic issues are important to dental patients before and after active treatment. It is also equally important that people be able to chew their food to maintain proper nutritional intake. However undertaking major restorative dental care during active cancer treatment may not be practical from a comfort standpoint nor is it a time when a patient feels able to tolerate extensive or lengthy dental appointments.

There are few places in the country where both comprehensive dental care and experience with oncology patient's issues co-exist. In Ontario these places include hospitals associated with cancer treatment facilities in London, Sudbury, Toronto – Sunnybrook and Princess Margaret, and Ottawa. In other provinces there are also cancer centres that have dental clinics and a first point of contact would be the closest dental school that may be able to provide a practitioner or clinic that treats oncology patients. Elsewhere it is unlikely that your dentist would have had the opportunity to acquire sufficient experience treating cancer patients.

### **Dentists assisting with smoking cessation**

The ideal is not to smoke and smoking cessation can be addressed during all phases of cancer treatment from pre-diagnosis to post treatment. Studies show that dentists and medical professionals who discuss smoking cessation with patients are more likely to persuade or assist their patients to quit.

Dentists can alert their patients to signs present in their oral cavity such as increased periodontal disease, mucosal changes, dental staining and other clinical features . The authors find it useful to point out these oral changes to patients and then ask them to think that since the tobacco smoke is only present in the oral cavity for a short amount of time and it is capable of causing changes – to imagine what it might be doing to the lungs since it is present and in contact with the lung tissue for greater length of time.

The Canadian dental association has published an evidence-based paper in 2001 discussing the effects of smoking on periodontal (gum) disease, recovery from periodontal disease and the effect of intervention by dentists to aid patients in quitting both smokeless tobacco and smoking. More information may be found at the following web-site: <http://www.cda-adc.ca/jcda/vol-67/issue-3/149.html>