

Dry Mouth & The Cancer Patient

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Xerostomia is the scientific term for a chronically dry mouth. Though it might not seem like that big of a deal, dry mouth is actually a very uncomfortable — and potentially serious — side effect of cancer therapy.

Xerostomia is associated with an increased incidence of dental decay (cavities), oral fungal infections (candidiasis), halitosis, burning mouth, gingivitis and periodontal disease. Dry mouth may also cause dysphagia (difficulty in swallowing), dysgeusia (altered or loss of taste), and difficulty in speaking and chewing, all of which ultimately affect quality of life. Dry mouth can also manifest as constant thirst, mouth sores, stringy or thick saliva, cracks in the corners of the mouth or lips, or having dentures that no longer have retention.

Systemic causes of xerostomia include endocrine (e.g., diabetes mellitus), autoimmune (e.g., Sjögren's syndrome, systemic lupus erythematosus), infectious (e.g., hepatitis C virus), and granulomatous (e.g., tuberculosis and sarcoidosis) diseases. For cancer patients, immunotherapy (primarily immune checkpoint inhibitors) can, in some cases, lead to autoimmune diseases such as Sjögren's syndrome. Allogeneic hematopoietic stem cell transplants (HSCT) are often used in blood cancers such as leukemia or lymphoma. Chronic graft vs.-host-disease (cGVHD) is a complication that may occur in 30–70% of these patients. One of the symptoms of cGVHD is dry mouth due to salivary gland destruction.

Chemotherapy induced dry mouth is prevalent in many patients undergoing treatment, regardless of the type of cancer. The onset of oral symptoms generally begins in the 7th to the 10th day after the administration of chemotherapy and usually resolves after completion of chemotherapy. Changes in salivary gland function can be caused by several chemotherapeutic agents including doxorubicin, cyclophosphamide, fluorouracil, methotrexate, and vinblastine.

Most cases of xerostomia are due to local factors such as multiple medications (polypharmacy), radiotherapy (esp. cumulative dose greater than 30 Gy) for treatment of head and neck malignancies, surgical removal of salivary glands, and lifestyle factors, such as alcohol, tobacco, excessive salt and caffeine consumption. Dehydration can also cause xerostomia. With prostate cancer, we can add radiopharmaceuticals such as lutetium 177 (Pluvicto) and Actinium 225, as the salivary glands (surprisingly) express PSMA.

Salivary gland inflammation is a relatively common complication of radioactive iodine (RAI) therapy in thyroid cancer patients, which may result in subsequent xerostomia. Reports note the incidence of salivary gland effects can be as high as 70%, with xerostomia affecting 10 - 30% of patients. Xerostomia following RAI was shown to be dose-related; the concentration of iodine in the salivary glands can be 30 to 40 times that of blood.

Polypharmacy is the most common cause of xerostomia. Drug types that can cause dry mouth include antidepressants, antihistamines, opioids, antihypertensives, antibiotics, steroids, cannabinoids, antipsychotics, decongestants, etc. The effects of these drugs on xerostomia can be synergistic; the more xerostomic drugs one takes, the more potential for dry mouth to occur.

Patients with cancer may be on antidepressants, opioids (for pain), antihypertensives (for high blood pressure brought on by cancer meds, steroids, platinum based chemo), cannabinoids (for pain, anxiety, sleep aid), steroids, etc.

People with xerostomia are much more prone to dental decay. Saliva helps protect teeth from decay in several ways. Saliva helps neutralize the lactic acid formed by plaque bacteria's fermentation of sugars. It helps wash away food debris and plaque bacteria. Cavities form when acid formed by plaque causes demineralization of the tooth surface. The length of time that the teeth are exposed to sugar-containing foods and the frequency of eating sugars may be more important than the total consumption of sugars.

Saliva contains minerals that can remineralize the tooth, helping to keep the situation in equilibrium. Without adequate saliva, more minerals are lost than are put back, and cavities can form (often rather quickly). Decay in patients with dry mouth are often along the root surfaces of the teeth and interproximal (between the teeth); areas that are often difficult to restore. The use of fluoride in toothpaste, mouthwash & varnish (dentist applied) can help reduce decay as the tooth can incorporate it into the remineralization process. Tooth surfaces that have fluoride incorporated into them are more resistant to the acid attack from plaque.

Dry mouth also increases the risk of gingivitis and periodontal disease, which can cause loss of bone supporting the teeth. ADT (for prostate cancer) can also increase the risk for periodontal disease, by 300% or more. When severe, periodontal disease often necessitates surgery to treat the disease or extraction of hopeless teeth.

Many advanced cancer patients take bone strengthening drugs to treat or prevent bone density loss. Drugs such as zoledronic acid (Zometa), denosumab (Prolia or Xgeva) and IV bisphosphonates can be effective, but come with an increased risk for osteonecrosis of the jaw (ONJ). ONJ occurs when cells in the jaw bone die and the body tries to rid itself of the dead bone. The incidence of ONJ is approx. 2% for cancer patients taking those medications. ONJ tends to occur most commonly after tooth extraction or gum surgery, when the gum tissue doesn't heal properly and the jawbone is left exposed. The exposed bone doesn't receive good blood flow and bone cells die. Therefore, the consequences of xerostomia greatly increase the risk for ONJ.

The symptomatic relief of oral dryness includes hydration (frequent sipping of water), discontinuation or reduction in xerogenic medications, and elimination

of common dry mouth offenders, such as tobacco and alcohol. Artificial salivary substitutes (i.e., commercial products containing specific ingredients, whose properties resemble those of the natural saliva) are frequently used as symptomatic treatments for patients with decreased salivary flow rate. They act as oral lubricants that maintain the lubrication of the mucosa and can relieve the sensation of dryness, without stimulating the salivary flow. However, saliva substitutes' action tends to be short lived and requires frequent usage.

Some people with dry mouth do have some residual functional salivary tissue, so the use of salivary stimulants (sialogogues) is worth trying. Acid-driven stimulation of salivary secretion is generated by the acidification of the oral cavity, with malic and citric acid being the most commonly preferred sialogogues. A drawback to acid stimulation using lemon drops or similar, is that many contain sugar, so sugarfree products should be used. Also, acidification of the oral cavity can increase the risk of dental decay. If salivary stimulants do not seem to work, it is best to quickly discontinue their usage to avoid negative effects.

Sugarless chewing gums can also be used to stimulate the salivary glands, aiming to increase the saliva secretion through mechanical stimulation. The stimulation of the saliva secretion also increases the plaque pH, reducing the risk of caries formation. Artificial sugars such as saccharine, aspartame, sorbitol, xylitol, mannitol, etc. are not broken down into acid by plaque bacteria. Xyletol has been shown to actually help in the prevention of dental decay, beyond not being able to be fermented to acid.

Some patients may benefit from drug therapy to address their dry mouth. Provided sufficient functional salivary tissue is present, the possibility exists of being able to further stimulate saliva production from the glands. Currently there are two prescription drugs available: pilocarpine (Salagen) and cevimeline (Evoxac). However, both have potentially significant side effects that may preclude their usage. Talk to your oncologist.

Good oral hygiene is critical in preventing dental disease. Brush often, ideally upon waking, before bed and after every meal. Use a fluoride containing toothpaste. Ask your dentist about prescription strength fluoride toothpaste (Prevident or generic). Clean between the teeth (interproximal) daily (best before bed) with floss or picks. If you wish to use mouthwash, use fluoride containing rinses without alcohol.

Tips for dry mouth:

- **Chew sugar-free gum** or suck on sugar-free hard candies to stimulate the flow of saliva. For some people, xylitol or other artificial sugars may cause diarrhea or cramps if consumed in large amounts.
- **Limit your caffeine intake** because caffeine can make your mouth drier.
- **Don't use mouthwashes that contain alcohol**

- **Avoid alcoholic beverages**
- **Stop all tobacco use**
- **Limit salt intake**
- **Avoid sugary foods and beverages** -- Decrease your fermentable carbohydrate intake, especially sticky foods such as cookies, bread, potato chips, gums, candies. Avoid the frequent intake of acidic beverages (such as most carbonated and sports replenishment drinks) and lemon products.
- **Sip water** or sugarless drinks regularly. Stay well hydrated.
- **Suck on ice chips**
- **Try over-the-counter saliva substitutes** — look for products containing xylitol, such as Mouth Kote or Oasis Moisturizing Mouth Spray, or ones containing carboxymethylcellulose or hydroxyethyl cellulose, such as Biotene Oral Balance.
- **Try a mouthwash designed for dry mouth** — especially one that contains xylitol, such as Biotene Dry Mouth Oral Rinse or ACT Total Care Dry Mouth Mouthwash, which also offer protection against tooth decay.
- **Avoid using over-the-counter antihistamines and decongestants** because they can make your symptoms worse.
- **Breathe through your nose**, not your mouth.
- **Add moisture to the air at night** with a room humidifier.

Other dry mouth products

Biotene - makes toothpaste, mouthwash, gel, moisturizing spray

Oral B - mouthwash, lozenges

Act - gum, lozenges, mouthwash

OraCoat XyliMelts Dry Mouth Relief Moisturizing Oral Adhering Discs

Xerostom - mouthwash, toothpaste, gel

Salivea - toothpaste, mouthwash

Spry - spray, gum

Lubricity - spray

-- There is no one best product. Nothing can truly substitute for saliva. Only with trial and error will you find what works best for you --

Web sites for more info. and dry mouth products

<https://www.hopkinsmedicine.org/health/conditions-and-diseases/dry-mouth-remedies-14-to-try>

<https://www.aaom.com/dry-mouth>

<https://sjogrens.org/member-community/product-directory/products-for-dry-mouth>