

Reviewing Xerostomia: A Common Condition on the Rise

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Abstract

Xerostomia encompasses a variety of signs and symptoms that collectively characterize a dry mouth. Intermittent dry mouth is common and is reversible by providing adequate oral hydration, stress management, and diet and lifestyle changes. When xerostomia becomes a chronic condition, investigation of the contributing causes and conditions is required. While having dry mouth may be bothersome, it can also be debilitating.

Here, the role of saliva is reviewed with an eye to how its functional impairment effects oral and systemic health. The many signs and symptoms of xerostomia are described to facilitate its identification and treatment. The causes of xerostomia are varied and wide-ranging, and several are explored here as are various medical and non-medical treatment options. Included are 6 case vignettes gleaned from interviews of patients with xerostomia who remedied their symptoms, all or in part, using a specific toothpaste and oral rinse, ClōSYS. These interviews, conducted by this author with the support of Rowpar Pharmaceuticals, Inc., demonstrate that ClōSYS is a safe, viable option for those striving to optimize self-care at home. Health care practitioners can help patients with xerostomia, not only by lessening their symptoms and preventing complications, but also by providing resources, education and support.

Xerostomia, from the Greek words, *xeros* for dry and *stoma* for mouth, is the term used to describe the signs and symptoms of a dry oral cavity associated with a reduction in saliva flow. The term is also applied to the *perception* of mouth dryness.¹

Having a dry mouth is part of the human experience. Most everyone has had their mouth suddenly go dry when put on the spot or asked to speak extemporaneously in front of an audience. People snore, get colds, and breathe through their mouths. They smoke cigarettes, drink alcohol, and consume soda and coffee, sometimes in excess, that can lead to a dry mouth. Oftentimes, the xerostomia that results is temporary and potentially reversible, and simple lifestyle strategies and dietary choices restore moisture to the oral mucosa.²⁻⁴

INCIDENCE OF XEROSTOMIA

Xerostomia can be chronic, severe, and life-altering. This may apply to those taking prescription medications, particularly the elderly, who are often subject to polypharmacy. Also, commonly afflicted are

people undergoing radiotherapy for head and neck cancers, those with systemic disease, addiction or an eating disorder. Regardless of cause, approximately 20% of the general population suffers from xerostomia with women, and seniors of both sexes, more commonly afflicted.³ As the geriatric population increases, a growing number of people will be seeking treatment for xerostomia and related complications.² Reviewing xerostomia will help practitioners gain an appreciation of its prevalence, causes, consequences and treatments, translating into better, more compassionate, patient care.

SALIVA: KEY TO ORAL/SYSTEMIC HEALTH

Reviewing the functions of saliva elucidates what happens when its role in health and wellbeing is compromised. Between .5 and 1.5 liters of this mineral-rich fluid is produced each day, primarily by the sublingual, submandibular and parotid glands. Composed of enzymes, electrolytes, buffering agents and immunoglobulins, saliva initiates the digestive process, protects the mouth from trauma and infection, and allows for the sensation of taste. Saliva lubricates

the mouth, making it comfortable to eat, swallow and speak. At a pH of 6-7, it remineralizes the teeth and maintains an optimal oral microbiome. It clears away food particles, impeding dental decay, gum disease and oral malodor. When salivary function is impaired, there are negative effects on both oral and systemic health and quality of life.^{1-3,5}

MANIFESTATIONS OF XEROSTOMIA

The signs and symptoms of xerostomia are diverse. They range in severity from mild to debilitating, and may include some or many of the following:¹⁻⁷

- Mouth dryness
- Stringy, frothy saliva
- Sores at the corners of the mouth
- Trouble speaking, eating, chewing and swallowing
- Dry throat, persistent cough
- Sore, hoarse throat
- Pale gums
- Glossy, smooth oral mucosa
- Sore, red, fissured tongue devoid of characteristic papillae
- Aberrant taste sensation
- Ongoing thirst; frequent trips to the bathroom
- Waking up parched in the middle of the night
- Dentures unstable, sticking to the roof of the mouth
- Dentures irritating or cutting into dry, vulnerable gingival tissue
- Lips appearing chapped, cracked, atrophic
- Sensitivity to spicy, dry, acidic foods
- Burning sensation in oral cavity
- Tongue coated white with candidiasis
- Mouth sores, tongue ulcers
- Tooth decay and gingivitis
- Oral malodor
- Tender and/or enlarged salivary glands

ETIOLOGY OF XEROSTOMIA

With over 400 medications known to cause dry mouth, it is not surprising that prescription drug use is the most common cause of xerostomia. Research shows that the more medications taken, the higher the incidence of xerostomia. For example, 17% of 20-80-year-olds not taking any medications reported symptoms of xerostomia. Those taking 3 or more medications reported an incidence of 34%, and that number climbed to 67% for those taking 7 or more. Xerostomia is most prevalent in the elderly where medications are more likely to cause the condition than the aging process itself.²⁻⁴ Common medications with xerostomia as a side effect include antidepressants, anti-hypertensives, antihistamines, antipsychotics, beta blockers, anti-anxiolytics and non-steroidal anti-inflammatories taken for daily aches and pains.^{1,4,6,8}

Radiotherapy for head and neck cancers is a cause of significant xerostomia. By their superficial anatomical location, salivary glands are subject to damage by ionizing radiation passing through them to reach deep head and neck tumors. That damage is not only evident in 50% of patients within the first week, it often continues over time and may be irreversible. The severe xerostomia leads to sub-optimal nutritional intake, making it a challenge to maintain health.^{1,9,10}

Xerostomia can be daunting for patients with Sjogren's Syndrome, an autoimmune disease of unknown etiology that primarily affects middle-aged women. While it targets numerous organ systems, Sjogren's is most well-known for attacking the lacrimal and salivary glands, producing the pathognomonic dry eyes and dry mouth. Every effort is made to stimulate remaining functional salivary gland tissue with medication while providing palliative care to these patients.^{1,11,12}

Xerostomia is evident in several chronic diseases. Among them are the connective tissue disorders such as lupus erythematosus, systemic sclerosis and rheumatoid arthritis. Dry mouth is a common occurrence in patients with diabetes mellitus, hypertension, Hepatitis C, Epstein-Barr, renal disease and Parkinson's. Xerostomia has also been reported as a perceived sensation in individuals who have suffered a stroke or have Alzheimer's disease.^{3,13,14}

There are various other contributing factors to xerostomia. Psychological disorders, such as depression and anxiety, can suppress salivary

flow and alter the composition of saliva leading to dry mouth.¹⁵ Bulimia nervosa, an eating disorder characterized by bingeing and purging, results in damage to salivary glands caused by the presence of gastric contents in the oral cavity over time.^{16,17} Illicit drug use contributes to xerostomia as well. Opiates, and buprenorphine, the drug used medically for opiate withdrawal, cause substantial dry mouth, predisposing users to dental caries, gingivitis and tooth loss.¹⁸ Methamphetamines upregulate the sympathetic nervous system producing xerostomia that can result in tooth erosions.¹⁹ Additionally, chronic cannabis use is known to create hyposalivation and dental decay.²⁰ The popularity of these drugs requires health professionals to treat the physical complications of addiction while making necessary referrals to support overall health and long-term recovery.

TREATMENT OF XEROSTOMIA

The initial treatment of xerostomia addresses lifestyle habits. Patients are encouraged to eliminate or curtail smoking, drinking alcohol, consuming caffeinated beverages, and using alcohol-based mouth washes. Hydration is emphasized as is a plant-based, nutrient-dense diet that avoids sugary, sticky, spicy, dry and crumbly foods. Herbal teas, coconut water, and aloe vera juices are offered as alternatives to dehydrating beverages. Issues of congestion, mouth-breathing and snoring are addressed, a humidifier may be employed, and dentures are removed before sleep.^{7,21}

When medication is the reason for the patient's xerostomia, dosages are reduced, drugs with a different mechanism of action are tried, and patients are advised to take their medications in divided doses during the day. Attempts are made to reduce the number of drugs the patient is taking, if possible.^{1,2,4,7}

Sialogogues, like Pilocarpine (Salagen®) and Cevimeline (Evoxac®) are medications used when xerostomia is severe, yet there is presence of some functional salivary gland tissue. Pilocarpine, though effective in half of patients with radiation-induced xerostomia, causes many side effects including skin flushing, nausea, headache, diarrhea, dizziness, dyspepsia and urinary frequency. It must be used judiciously in those with heart and lung ailments and is contraindicated with glaucoma. Cevimeline may be better tolerated with common side effects limited to dyspepsia and sweating.^{1,3-5,7,11,22}

Non-medical treatments for xerostomia are readily available with variable results. These include saliva stimulants and substitutes, lozenges, gums and lubricants, alcohol-free rinses, fluoride toothpastes and hydrating oral sprays. Intraoral electrical stimulation devices, traditional acupuncture, hyperbaric oxygen therapy and the Ayurvedic practice of oil pulling are modalities that have shown promise in alleviating xerostomia, although further research is needed to determine their efficacy.^{1-4,22}

Impeccable oral care is of vital importance in the management and treatment of xerostomia and its complications. Frequent dental checkups can prevent and minimize infections, tooth erosions and gingivitis. Vigilant tooth brushing, mouth rinsing, tongue scraping, gentle flossing and hydro-flossing are components of a thorough home-care regimen.¹⁻⁴ Numerous oral care products flood the online and virtual shelves of pharmacies making it difficult for patients to choose the most effective over-the-counter products to support self-care. Health care professionals can be a good resource for patients by introducing them to safe, effective products for supplementing their self-care strategies.

PATIENTS EXPERIENCES

Rowpar Pharmaceuticals, Inc., makers of the ClōSYS line of oral care products, conducted a survey of their customers to ascertain the effectiveness of ClōSYS in all eviating symptoms of xerostomia. ClōSYS, recipient of the American Dental Association (ADA) Seal for combating oral malodor, had previously queried their customers regarding oral sores. Those surveys, interviews, and case studies showed ClōSYS to be effective in ameliorating the pain and devastation of oral mucositis.²³ This author was privileged, once again, to conduct the xerostomia interviews and provide the following abbreviated case vignettes for review.

Upon the recommendation of her dental hygienist, **a 61-year-old female** began using ClōSYS Silver unflavored mouth rinse twice daily in 2017 for her advanced gingivitis. When she discovered that the ClōSYS products also relieved her chronic dry mouth, she was elated. "I had been subject to terrible dry mouth as a side effect of taking two prescription medications. I thought I would have to live with dry mouth forever, and now I don't."

A 65-year-old nurse and lab technician suffered with dry mouth for many years until she discovered a 4-minute healing procedure that included ClōSYS unflavored mouth rinse. “Between stress and anxiety, and having to wear a mouth guard, I constantly had an uncomfortably dry mouth. The oral hygiene protocol, developed by Dr. Elli, D.D.S., changed my life, and the ClōSYS mouth rinse is an integral part of that. I wouldn’t substitute anything else for it.”

A female dental hygienist had been recommending ClōSYS products to patients with dry mouth, especially due to medication, for 17 years. It was not until her 5th grade son developed a problem that she was fully able to appreciate its effects. The 10-year-old boy was beset with allergies. The thickened mucus and post nasal drip caused him to consistently breathe through his mouth, resulting in chronic dry mouth and fetid breath. “It was impossible to sit across from him at the breakfast table. I put him on the ClōSYS toothpaste and got him rinsing twice a day with the mint-flavored rinse. His problems resolved quickly. It was truly life-altering. He came home from school excited one day, a few grades later, because a girl had told him he had such sweet breath. Need I say more?”

A 63-year-old female suffering from Sjogren’s Syndrome had such severe dry mouth that her tongue was cracked and sore. She also had frothy cotton mouth and ongoing oral candidiasis. The patient’s dental hygienist recommended ClōSYS. “The results have been life changing. My mouth is not as dry, the thrush is in check, my tongue is no longer cracked, and I don’t have to drink water all day long and constantly run to the bathroom.” Like so many with Sjogren’s, the disease had taken a toll on this patient’s teeth. “I feared losing my teeth, but, thankfully, ClōSYS has spared me that hardship. The longer you use it, the better results you get.”

A 65-year-old registered dental hygienist used ClōSYS prophylactically to avoid mouth sores, dry mouth and dental decay as she was facing upcoming chemotherapy treatment for a malignancy. She had heard horror stories about others who had suffered from xerostomia and oral mucositis due to their cancer treatment. “I used the toothpaste and oral rinse daily, and other than a few mouth sores, I was okay. I ate what I wanted, and any dry mouth I experienced was mild. I am both grateful for, and impressed with, ClōSYS.”

A male 80-year-old former athlete was diagnosed in 2012 with a deep neck tumor that necessitated aggressive treatment with chemotherapy and radiation. “The beam they used to reach the tumor ended up frying my salivary glands. As a result, I wound up with such severe dry mouth that bacteria grew rampantly and destroyed my teeth. When my dental hygienist told me to get ClōSYS, things began to turn around for me.” The patient now rinses and swishes with the unflavored rinse up to ten times a day, and he uses the mouth spray when he wakes up parched in the middle of the night and before going into a gathering or the theater. “My issues are not going to disappear, but with ClōSYS, I now have an effective way to deal with them. And I have my social life back.”

I’VE BEEN TO THE DESERT ON A HORSE... AND ITS NAME WAS XEROSTOMIA²⁴

Xerostomia can be temporary and reversible, or it can be permanent and debilitating. Effecting a fifth of the population of the USA, its prevalence in the growing geriatric community means its incidence will continue to soar. Whether from a medication, Sjogren’s Syndrome, systemic disease, radiation treatment, a psychological condition, eating disorder or addiction, xerostomia can have devastating consequences on physical and emotional well-being, as these personal cases reflect. While there is no known cure, there are many treatment options and oral care products available to help diminish its negative effects on quality of life. The frequency and severity of xerostomia warrants the attention of health care practitioners striving to deliver optimal patient care. ClōSYS oral health care products may provide a safe, effective way to relieve all or some of the symptoms of xerostomia. Lastly, health care practitioners can be an indispensable resource to patients thirsting for answers as they try to find the treatments and products that best meet their needs.

REFERENCES

- [1] Miranda-Rius, J., Brunet-Llobet, L., Lahor-Soler, E. and Farré, M. (2015). Salivary secretory disorders, inducing drugs, and clinical management. *International Journal of Medical Sciences*, 12(10), pp.811-824.
- [2] Han, P., Suarez-Durall, P. and Mulligan, R. (2015). Dry mouth: A critical topic for older adult

- patients. *Journal of Prosthodontic Research*, 59 (1), pp.6-19.
- [3] Ying Joanna, N. and Thomson, W. (2015). Dry mouth – an overview. *Singapore Dental Journal*, 36, pp.12-17.
- [4] Ada.org. (2018). *Xerostomia (dry mouth)*. [online] Available at: <https://www.ada.org/en/member-center/oral-health-topics/xerostomia> [Accessed 30 Jul. 2018].
- [5] MedicineNet.com. (2018). *What is dry mouth?* [online] Available at: https://www.medicinenet.com/dry_mouth/article.htm [Accessed 30 Jul. 2018].
- [6] Nordqvist, C. (2018). *Everything you need to know about dry mouth*. [online] Medical News Today. Available at: <https://www.medicalnewstoday.com/articles/187640.php> [Accessed 30 Jul. 2018].
- [7] Villa, A., Connell, C. and Abati, S. (2014). Diagnosis and management of xerostomia and hyposalivation. *Therapeutics and Clinical Risk Management*, pp.45-51.
- [8] Scully, C. (2018). Drug effects on salivary glands: dry mouth. In: C. Scully, ed., *Oral Diseases*. [online] Blackwell Munksgaard, pp.165-176. Available at: <http://www.blackwellmunksgaard.com> [Accessed 30 Jul. 2018].
- [9] Pinna, R., Campus, G., Cumbo, E., Mura, I. and Milia, E. (2015). Xerostomia induced by radiotherapy: an overview of the physiopathology, clinical evidence, and management of the oral damage. *Therapeutics and Clinical Risk Management*, 11, pp.171-188.
- [10] National Cancer Institute. (2018). *Head and neck cancers*. [online] Available at: <http://www.cancer.gov/types/head-and-neck/head-neck-fact-sheet#q1> [Accessed 30 Jul. 2018].
- [11] Tincani, A., Andreoli, L., Cavazzana, I., Doria, A., Favero, M., Fenini, M., Franceschini, F., Lojacono, A., Nascimbeni, G., Santoro, A., Semeraro, F., Toniati, P. and Shoenfeld, Y. (2013). Novel aspects of Sjögren's syndrome in 2012. *BMC Medicine*, 11(1).
- [12] Van der Reijden, W., Vissink, A., Veerman, E. and Amerongen, A. (1999). Treatment of oral dryness related complaints (xerostomia) in Sjogren's syndrome. *Annals of the Rheumatic Diseases*, 58(8), pp.465-474.
- [13] Baharvand, M., Khodadoust, A., Mohammadi, M., Mortazavi, H. and Movahhedian, A. (2014). Xerostomia due to systemic disease: a review of 20 conditions and mechanisms. *Annals of Medical and Health Sciences Research*, 4(4), pp.503-510.
- [14] López-Pintor, R., Casañas, E., González-Serrano, J., Serrano, J., Ramírez, L., de Arriba, L. and Hernández, G. (2016). Xerostomia, hyposalivation, and salivary flow in diabetes patients. *Journal of Diabetes Research*, 2016, pp.1-15.
- [15] Salah, S. (2017). Effect of stress, anxiety and depression on unstimulated salivary flow rate and xerostomia. *Journal of Dental Research, Dental Clinics, Dental Prospects*, [online] 11(4), pp.247-252. Available at: <http://www.joddd.tbzmed.ac.ir> [Accessed 30 Jul. 2018].
- [16] Bretz, W. (2002). Oral profiles of bulimic women: diagnosis and management. What is the evidence? *Journal of Evidence Based Dental Practice*, 2(4), pp.267-272.
- [17] Clarke, A. (2012). Eating disorders and your mouth health. *Tribune 242*, pp. <http://www.tribune242.com/news/2012/oct/30/Eating-disorders-and-your-mouth-health/jh>.
- [18] Common buprenorphine side effects: headache, constipation, dry mouth. (2018). The National Alliance of Advocates for Buprenorphine Treatment. Available at: https://www.naabt.org/faq_answers.cfm?ID=3 [Accessed 31 Jul. 2018].
- [19] Rommel, N., Rohleder, N., Koerdt, S., Wagenpfeil, S., Härtel-Petri, R., Wolff, K. and Kesting, M. (2016). Sympathomimetic effects of chronic methamphetamine abuse on oral health: a cross-sectional study. *BMC Oral Health*, 16(1).
- [20] Veitz - Keenan, A. and Ferraiolo, D. (2018). *Cannabis use and xerostomia*. [online] Dimensions of Dental Health. Available at: http://www.dimensionsofdentalhygiene.com/2011/11_Nove

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- mberfetures/cannabis_Use_and_Xerostomia.aspx [Accessed 31 Jul. 2018].
- [21] Donoho Dental Associates, PC. (2016). *Thirsting for Answers? Try these 6 home remedies for dry mouth*. [online] Available at: <http://http://www.donohodental.com/thirsting-answers-try-6-home-remedies-dry-mouth/> [Accessed 31 Jul. 2018].
- [22] Scully, C. (2013). Dry Mouth (Xerostomia and Hyposalivation). In: C. Scully, ed., *Oral and Maxillofacial Medicine*, 3rd ed. [online] Churchill Livingstone, pp.91-97. Available at: <http://https://doi.org/10.1016/B978-0-7020-4948-4.00008-8> [Accessed 31 Jul. 2018].
- [23] Cooper, A. (2015). Oral care for mouth sores *Otolaryngology (Sunnyvale)*, 01,7:314. doi: 10.4172/2161-119X.1000314
- [24] Bunnell, D. (1971). "A Horse With No Name" recorded by America from the album America, Warner Brothers Records.

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