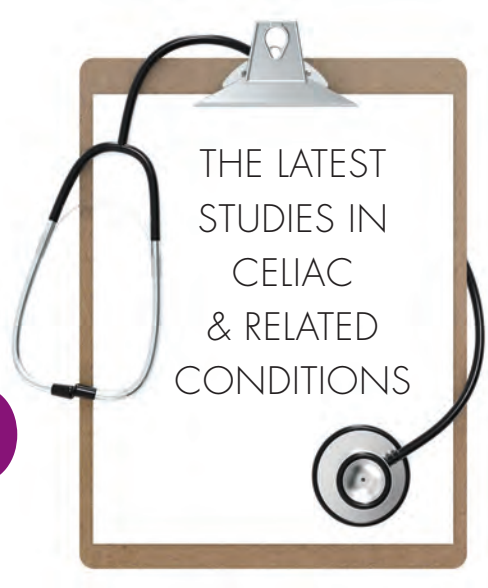
Research Roundup



Oral health is considered one of the fundamental parameters related to people's general health and behavior. Oral health status allows individuals to run their daily activities (eating and speaking) without any pain, discomfort, restriction, or aesthetic problems.

Oral health is frequently affected in patients with celiac disease and gluten intolerance. The most common gluten-driven problems include:

- ▷ **Dry mouth (xerostomia)**
- ▷ **Oral candidiasis/oral thrush**
- ▷ **Frequent canker sores (recurrent aphthous stomatitis – RAS)**
- ▷ **Tooth decay/caries or cavities**
- ▷ **Dental enamel defects**

Xerostomia is the subjective sensation of dry mouth, which is often (but not always) associated with hypofunction of the salivary glands. Salivary gland hypofunction has been defined as any objectively demonstrable reduction in whole and/or individual gland flow rates. Xerostomia may also result from a change in composition of saliva (from serous to mucous).

Xerostomia may contribute the following signs and symptoms:

- *Dental caries*
- *Oral candidiasis*
- *Dysgeusia – altered taste sensation (e.g., a metallic taste)*
- *Burning mouth syndrome – a burning or tingling sensation in the mouth.*
- *Dysphagia – difficulty swallowing and chewing, especially when eating dry foods. Food may stick to the tissues during eating.*
- *Fissured tongue*
- *Dry, sore, and cracked lips and angles of mouth*
- *Excessive thirst*
- *Xerostomia may be the only symptom of celiac disease or gluten intolerance, especially in adults, who often have no obvious digestive symptoms. Typically, the most common cause of gluten-associated mucosal dryness is Sjogren's syndrome, an autoimmune disease resulting in chronic inflammation of salivary and lacrimal glands.*

"Salivary gland involvement and oral health in patients with coeliac disease." *European Journal of Oral Sciences.* 2022 Jun;130(3):e12861. Liu, J., et al.

Oral candidiasis, also known as oral thrush, is a yeast/fungal infection caused by Candida species on the mucous membranes of the mouth. C. albicans is carried in the mouths of about 50 percent of the world's population as a normal component of the oral microbiota. Candida, in its normal state, is not considered a disease, but when Candida species become pathogenic and invade host tissues, oral candidiasis can occur. Signs and symptoms include a burning sensation in the mouth or metallic, acidic, salty, or bitter taste in the mouth. Occasionally there can be dysphagia (difficulty swallowing), which indicates that the candidiasis involves the oropharynx or the esophagus, as well as the mouth. The trachea and the larynx may also be involved where there is oral candidiasis, and this may cause hoarseness of the voice.

Oral candidiasis is considered an oral dysbiosis. Poorly controlled gluten intolerance and celiac disease are among predisposing factors contributing to the development and progression of oral candidiasis. The mechanisms linking gluten and oral candidiasis include low level of protective salivary IgA, xerostomia, and certain gluten-driven immune-mediated mechanisms. The diagnosis can typically be made from clinical appearance alone. Additional investigations to detect the presence of candida species include oral swabs, oral rinse, or oral smears.

"To Be or Not to Be a Pathogen: Candida albicans and Celiac Disease." *Frontiers in Immunology.* 2019 Dec 5;10:2844. Renga, G., et al.

Recurrent aphthous stomatitis (RAS), also known as canker sores, is the most common disease of the oral mucosa and it typically starts in childhood or adolescence.

Unlike caries and periodontal disease, patients with RAS are unable to prevent it. RAS is known to be particularly painful. These idiopathic ulcerations are oval lesions of different sizes with clean edges surrounded by an erythematous halo. The ulcers typically present in the mucosa of the cheeks, lips, ventral and lateral surfaces of the tongue, gingiva, and occasionally, the soft palate. RAS lesions are self-limiting (simple aphthosis), resolving within 1-2 weeks in most patients. In those affected by the disease, the ulcers can compromise important daily functions, including nutrition, speech, and oral hygiene, and affect quality of life. This is important, considering that the lesions can last >2 weeks, with recurrent episodes in a period of 1-4 months. Some patients have continuous oral ulcerations; in these cases, some ulcers heal as others develop, with occasional genital ulcers. This corresponds to a clinical state known as complex aphthosis. Complex aphthosis has an underlying systemic cause, which does not correspond with the RAS diagnosis. Celiac disease and gluten intolerance are frequently associated with RAS, especially in young children. A strict gluten-free diet may reduce the frequency and extent of mucosal involvement in RAS.

"Celiac disease and hematological abnormalities in children with recurrent aphthous stomatitis" *Pediatrics International.* 2020 Jun;62(6):705-710. Yılmaz, S., et al.

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Tooth decay, also known as cavities or caries, is the breakdown of teeth due to acids produced by bacteria. Symptoms may include pain and difficulty with eating. Complications may include inflammation of the tissue around the tooth, tooth loss, and infection or abscess formation.

The cause of cavities is acid from bacteria dissolving the hard tissues of the teeth (enamel, dentin, and cementum). The acid is produced by the bacteria when they break down food debris or sugar on the tooth surface. Simple sugars in food are these bacteria's primary energy source and thus a diet high in simple sugar is a risk factor. If mineral breakdown is greater than build up from sources such as saliva, caries results. Celiac disease and gluten intolerance contribute to the development of caries via interfering with calcium absorption, affecting normal oral microbiome, and causing xerostomia.

"Serological study of celiac disease in children with dental caries." *Human Antibodies.* 2021;29(4):237-241. Kalvandi, G., et al.

Dental enamel defect, also known as dental enamel hypoplasia, is an enamel defect characterized by thin or absent enamel. In some cases, the defect occurs on only part of a tooth's surface, resulting in pits or grooves in the tooth's enamel. In other cases, an entire tooth may have an overly thin layer of dental enamel or may have no enamel at all. One of the common manifestations of celiac disease is dental enamel defect, which might be the only presenting symptom of celiac disease. Dental enamel problems stemming from celiac disease involve permanent dentition and include tooth discoloration (white, yellow, or brown spots on the teeth), poor enamel formation, pitting or banding of teeth, and mottled or translucent-looking teeth. The imperfections are symmetrical and often appear on the incisors and molars.

Tooth defects resulting from celiac disease are permanent and do not improve after adopting a gluten-free diet. However, dentists may use bonding, veneers, and other cosmetic solutions to cover dental enamel defects in older children and adults.

"Association between developmental defects of enamel and celiac disease: A meta-analysis." *Archives of Oral Biology.* 2018 Mar;87:180-190. Souto-Souza, D., et al. GFM

One of the common manifestations of celiac disease is dental enamel defect, which might be the only presenting symptom of celiac disease.

As always, consult a medical professional before beginning any new protocol.

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***Dr. Alexander Shikhman**, founder of the Institute for Specialized Medicine, is board certified in internal medicine and rheumatology. Dr. Shikhman also launched Gluten-Free Remedies™, a line of all natural supplements which help treat the complications that can arise from celiac disease. Find Dr. Shikhman at **ifsmed.com** and **glutenfreeremedies.com**.*