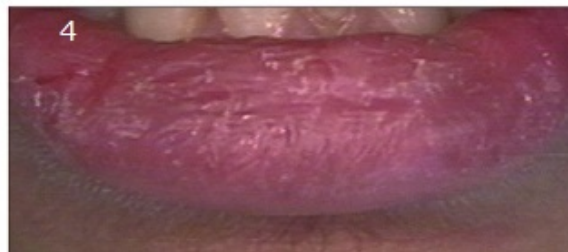


## Stomatitis (Oral Mucositis) in Children — Diagnosis and Treatment

[See online here](#)

**Stomatitis generally refers to the inflammation of the mouth and lips. Stomatitis can occur with or without oral ulceration. When stomatitis occurs, along with gingival inflammation, then the condition is known as gingivostomatitis. There are many causes of stomatitis of which common are infections, nutritional deficiencies chemotherapy and radiotherapy. Stomatitis can occur in any part of the mouth and disrupts one's ability to talk, sleep and eat.**



### Causes of Stomatitis in Children

#### Nutritional deficiency

Poor absorption or inadequate dietary intake of **iron**, **vitamin B2** (riboflavin), **vitamin B3** (niacin), **vitamin B6** (pyridoxine), **vitamin B9** (folic acid) or **vitamin B12** (cobalamine) can all manifest in the form of stomatitis.

Iron is an important element in cell repair and function, and deficiency of iron can lead to genetic downregulation and defective repair and replication of cells. **Tropical sprue** and **kwashiorkor** are examples of nutritional deficiencies.

#### Aphthous stomatitis

**Aphthous ulcers**, also known as **canker sores**, can occur in otherwise healthy individuals. It looks like a pale or yellow ulcer with red traces on its outer ring. The lips,

cheeks and the tongue are the main places the ulcer will appear. The ulcers are recurrent and the cause is still not known, but it is thought to be a **T cell-mediated immune response**.

Aphthous ulcers occur in about 20% of the population. They can occur after a certain period of time and heal completely without any intervention. The symptoms range from minor discomfort to severe forms where one is not able to eat. They tend to be painful, are more likely to come back and they last for a span of a week to ten days. Canker sores are rarely associated with the flu. They may occur because of poor sleep, medication, stress and due to some foods, such as cheese and chocolate.

The treatment of aphthous ulcers ranges from relieving the pain by giving local application ointments and promoting healing, but none of the treatments has proved to be efficient yet. Canker sores are not contagious and will heal by actions of the immune system even when there are no drug interventions.

## Angular stomatitis

Angular stomatitis is the **inflammation of the corners of the mouth**. In children, it is usually caused by the **licking of lips repeatedly** or by the **deficiency of vitamins** like riboflavin, folate, cobalamine or iron. Angular cheilitis can also be caused by any condition that causes the jaw to tightly close rather than normal which causes the angles to be always moist which favors the growth of *Candida albicans* or similar species. Hemolytic Streptococci, as well as *Staphylococcus aureus*, are also associated with angular cheilitis.

Treatment includes the administration of **oral nystatin** or if the occlusion is defective then adjusting the cause can be helpful in treatment. Anti-fungals, as well as antibiotics, have been shown to be effective in treating these lesions; thus, it is believed that there are many organisms that play a role in developing angular cheilitis.

## Denture-related stomatitis

As the name suggests, the condition occurs in people wearing dentures. It is also referred to as thrush and can affect people who use inhalers, steroids, and anyone whose mouth is not kept clean. It is associated with wearing ill-fitting dentures or those that have not been well cleaned and failing to remove the dentures when going to bed. The patient usually presents with **reddened mucosa** generally without ulceration and, in 90% of the cases, the cause is **candida albicans**. The treatment usually involves **anti-fungals**. **Good oral hygiene** and instructing the patients to avoid dentures during sleep can also be helpful.

## Allergic contact stomatitis

Also known as **allergic gingivostomatitis**, this is an example of a delayed type IV hypersensitivity reaction that occurs in atopic individuals. Allergens are usually different for different individuals. Symptoms include a burning sensation, plaques, itchiness, vesiculation, and pain.

The allergens combine with epithelial-derived proteins which lead to the formation of haptens which then binds with Langerhans cells in the mucosa which then presents the antigens to T lymphocytes to produce specific clones for that specific antigen. If the same antigen is encountered the second time, then an inflammatory response is triggered.

Allergic contact dermatitis is **more common than angular stomatitis** because the mouth is continuously being washed by saliva which washes away antigens. Secondly, oral mucosa is more vascular which means it has a better supply which, in turn, leads to antigens being carried away more readily. Lastly, it has less keratin than skin which means there is a decreased number of chances that the haptens will form.

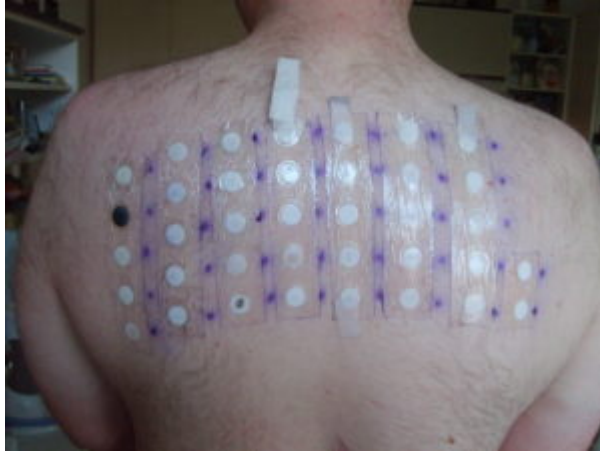


Image: "Patch test." by Jan Polák - Own work. License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

**Lichenoid lesion** can occur in chronic patients. Some of the most common allergens include peppermint, zinc citrate, cinnamaldehyde, nickel, and fluoride. Some allergens may originate from chewing gums, toothpastes, mouthwash, dental fillings, orthodontic bands, and wires and from certain other foods. A **patch test** can be of diagnostic value as it will assist in identifying the allergen and management includes avoidance of the allergen. Allergic materials could be latex, food additives and metals, and people are advised to be careful with the ingredients used in making hygiene products as they could be allergens.

## Migratory stomatitis

This is an atypical presentation of tongue termed as **geographic tongue**. It presents as areas of depapillation that migrate over time. It can occur anywhere in the mouth. The condition is also known as **stomatitis areata migrans**.

## Herpetic gingivostomatitis

This is caused by **herpes simplex virus type 1**. Prodromal symptoms include anorexia, fever, malaise and headache. The usual presentation is the appearance of numerous pin head vesicles which rapidly progresses to ulceration covered by yellow membrane. Since it is a viral disease, medication is offered but the body's immune system plays a huge role in how well the person recovers.

## Necrotizing ulcerative gingivostomatitis

This is an **acute infection of the gums** and is non-contagious. The common symptoms include painful bleeding of gums, ulceration and necrosis of interdental papillae. Treatment includes antibiotics, such as metronidazole and debridement.



[Image](#): "Ulcerative necrotizing gingivitis." by dr.Mohamed HAMZE - personal practice in dental cabinet. License: Public Domain

## Stomatitis nicotina

It is also known as **smoker's palatal keratosis** and usually occurs in pipe smokers. People who drink very hot drinks and the consumption of anything that is likely to irritate palate mucosa may also develop this condition. Stomatitis nicotina occurs only on the palate mucosa. The palate appears dry and cracked. The salivary glands become atrophic and the condition is reversible. The palate first reddens and slowly turns white.

## Chronic ulcerative stomatitis

This is a recently discovered condition which has an **immunopathological basis**. The condition is associated with erosions and the condition resembles oral lichen planus. **Immunofluorescence techniques** are used for diagnosis and treatment includes **hydroxychloroquine**.

## Evaluation of Stomatitis

### History

**Duration of symptoms** should be asked and whether the patient had those symptoms previously or not. Questions should be asked about **pain** and **severity** and **duration** and any **other associated symptoms** should be noted. History should be taken about the association of ulcers with certain kinds of food or drugs.

### Review of symptoms

Every system should be examined separately. A history of **weight loss** due to ulcers, chronic diarrhea, any **genital lesions** or **generalized weakness** should also be taken into account. Dental history, as well as a change in the patient's life, should be investigated to identify new things such as foods that can be triggering the stomatitis.

### Past medical history

Past history of any **illness** or **oral lesions**, **organ transplant**, use of **immunosuppressants**, **chemotherapy** or **radiation therapy** should be taken into account. **Drug history** is also very important in this aspect as many drugs can cause oral lesions.

## Physical examination

Note down the **vital signs** and general appearance of the patient. The mouth should be inspected thoroughly for the presence of lesions. The skin and genital area should be examined thoroughly for the presence of any lesions, desquamation, or rash. Ulcers should also be sought for seeing that they appear in most patients who develop stomatitis. It is important that the physician ably identifies the type of stomatitis.

## Testing for Stomatitis

**Bacterial and viral culture to help identify the type of fungi or bacteria responsible for the stomatitis, biopsy** if the lesion is recurrent, **CBC, serum iron studies** and testing the **deficiency of any vitamins**.

## Treatment of Stomatitis

Topical treatments include **anesthetics** like lidocaine rinse, protective coatings, corticosteroids, and sucralfate plus aluminum-magnesium antacid rinse. Caution can ease the pain of lesions. For herpetic lesions, **antiviral** like acyclovir can be given. Basic oral hygiene routines like removing any foreign objects in the mouth while sleeping, the use of a medicated mouthwash, as well as cleaning braces and dentures well, are preventive measures that can aid in preventing stomatitis. Allergen substances should also be avoided, and people should visit their dentists as recommended.

## References

Zaoutis, [edited by] Jeffrey M. Bergelson, Samir S. Shah, Theoklis E. (2008): [Pediatric infectious diseases](#)

Horning, GM (October 1996): **Necrotizing gingivostomatitis: NUG to noma**.

Treister NS, Bruch JM (2010). **Clinical oral medicine and pathology**. New York: Humana Press

Pindborg, Jens Jørgen (1973). [Atlas of Diseases of the Oral Mucosa](#)

Kliegman: **Nelson Textbook of Pediatrics**, 18th ed.

**Legal Note:** Unless otherwise stated, all rights reserved by Lecturio GmbH. For further legal regulations see our [legal information page](#).