

Tongue

The tongue is made up almost entirely of muscle fibres. It can be divided into an oral portion (tip, blade, front, centre and back) and a pharyngeal (throat) portion.

The movement of the tongue against the roof of the mouth, teeth and lips helps us to shape vocal sounds into words, as well as to eat and drink effectively. The taste buds located on the tongue membrane contribute to the experience of food flavour.

The dense network of nerves and muscle fibres in the tongue means that we can chew food without (usually) chewing on our tongue as well. Some of the disorders that affect the tongue include sore tongue, black hairy tongue and tongue-tie.

Tongue anatomy

The base of the tongue is located in the throat just above the larynx (voice box) and extends to the hyoid bone. The tongue is wrapped in the lingual membrane, which is studded with tiny projections called papillae. These papillae are responsible for the tongue's textured surface. At the back, sides and tip of the tongue are the taste buds. These help to distinguish basic food flavours including bitter, salty, sweet and sour. There are about 9,000 taste buds on the average adult tongue. Some taste buds are found in the throat and palate.

Taste buds explained

A taste bud consists of a cluster of receptor cells, and each cell is topped with a fine, hair-like projection called a microvillus. The receptor cells are connected to a mesh of nerves that transmit taste to the major nerve bundles including the facial nerve and the glossopharyngeal nerve. From there, taste information is sent to the brain and combined with olfactory information from the nose. Contrary to popular belief, the main organ of taste is the nose. Our sense of smell is thought to be about 10,000 times more acute than our sense of taste, which is why we can't detect most food flavours when we have a cold or blocked sinuses.

A range of tongue disorders

Some tongue disorders include:

- Loss of taste
- Sore tongue
- Black hairy tongue
- Glossodynia
- Benign migratory glossitis
- Tongue-tie.

Loss of taste

Taste is a chemical sense that is activated during eating and drinking. Reasons for a loss of taste include:

- A person may lose their sense of taste if the facial nerve is damaged in some way. For example, Bell's palsy may stop the facial nerve working properly and prevent or reduce chewing function (and, therefore, alter taste). It is uncommon for every taste nerve (bitter, salty, sweet and sour) to be affected.
- The autoimmune disorder known as Sjogren's syndrome causes reduced saliva production, which in turn reduces the sense of taste. This is because the taste buds can only detect flavour when food is properly mixed with saliva.
- Glossodynia, a condition characterised by a burning sensation on the tongue, is also linked to loss of taste in some cases.
- Some medications can result in an unpleasant metallic taste in the mouth, such as tetracycline (an antibiotic), lithium carbonate (an antipsychotic) and captopril (an antihypertensive).

Sore tongue

A sore tongue is usually caused by some form of trauma, such as biting your tongue, or eating piping-hot or highly acidic food or drink. Other causes of a sore tongue include:

- If your top and bottom teeth don't fit neatly together, tongue trauma is more likely.
- Some people may experience a sore tongue from grinding their teeth (bruxism).
- Disorders such as diabetes, anaemia, some types of vitamin deficiency and certain skin diseases can include a sore tongue among the range of symptoms.
- A sore tongue can be caused by disorders including black hairy tongue.

Black hairy tongue

While the term 'black hairy tongue' suggests the tongue surface looks black, it may also be dark yellow, brown, green or white. The tongue papillae are constantly renewing themselves and, usually, the old cells are shed as the new cells emerge. Black hairy tongue, a comparatively rare condition, is caused by the failure of the old cells to shed. The overgrowth of papillae trap food and bacteria, which create the characteristic dark 'coat' on the tongue's surface, while the tongue looks furred because of the layering of unshed papillae. The cause isn't known, but risk factors include:

- Poor oral hygiene
- Cigarette smoking
- Particular antibiotics
- Chemotherapy and radiation treatment for cancers of the head and neck
- Poorly managed diabetes.

Glossodynia

The main symptom of glossodynia is a burning sensation on the tongue surface. The various causes of glossodynia can include:

- Local infections, such as oral thrush (candidiasis)
- Damage to the lingual nerve
- Damage to nerves of the mouth during dental extractions
- Cigarette smoking
- Vitamin deficiencies
- Particular medications, such as diuretics and some blood pressure drugs.

Benign migratory glossitis

This condition is characterised by irregular and inflamed patches on the tongue surface that often have white borders. The tongue may be generally swollen, red and sore. Another name for this condition is geographic tongue. The cause of benign migratory glossitis is unknown, but risk factors are thought to include:

- Mineral or vitamin deficiencies
- Local irritants, such as strong mouthwashes, cigarettes or alcohol
- Certain forms of anaemia
- Infection
- Certain medications
- Stress.

Tongue-tie

The medical name for tongue-tie is ankyloglossia. Frenula are little strings of tissue found underneath the tongue, inside the cheeks near the back molars, and under the top lip. The frenum (or frenulum) under the tongue is called the lingual frenum. Tongue-tie is a condition characterised by a short frenum that stops the tongue from poking out past the lips. Other symptoms can include:

- Tongue tip can't touch the roof of the mouth
- Tongue can't be moved sideways
- Tongue tip may look flat or square instead of pointy when the tongue is extended
- Tongue tip may be notched or heart-shaped
- The front teeth in the lower jaw are gapped
- History of feeding or sucking problems.

Diagnosis methods

Depending on the disorder under investigation, diagnosis methods can include:

- Physical examination
- Medical history
- Salivary gland tests
- Biopsy.

Treatment options

Depending on the disorder and cause, treatment options can include:

- **Loss of taste** - treatment for the underlying disorder, such as an artificial saliva spray or gel for Sjogren's syndrome.
- **Sore tongue** - avoid hot, spicy or acidic food and drinks until the injury heals; wear a mouth guard at night to prevent tongue trauma from bruxing (teeth grinding); dermatological treatment for the skin disorder; treatment for the underlying disorder such as iron supplements for iron-deficiency anaemia; better management of diabetes under medical supervision.
- **Black hairy tongue** - greater attention to oral hygiene; brushing the tongue every time the teeth are brushed; regular scraping of the tongue with a special tongue-scraper, often in conjunction with a mild bleaching solution; stopping smoking.
- **Glossodynia** - treatment of underlying disorders such as improved diet; topical anaesthetic creams; avoidance of irritants; surgery on the lingual nerve if damage is the cause.
- **Benign migratory glossitis** - topical anaesthetic creams and prescription drugs including steroids.
- **Tongue-tie** - this condition usually resolves by the age of two or three years, which means the frenum 'loosens' or recedes by itself, given time. In persistent cases, the child may need to have an operation (frenectomy) to release the tongue.

Where to get help

- Your doctor
- Dentist
- Dental Health Services Victoria Tel. (03) 9389 8888
- Speech Pathology Association of Victoria Tel. (03) 9462 4899

Things to remember

- The movement of the tongue against the roof of the mouth, teeth and lips helps us to move food and drink through the oral cavity.
- The movement of the tongue against the roof of the mouth, teeth and lips helps us to articulate (shape sounds into speech).
- The taste buds located on the tongue's lingual membrane contribute to the experience of food flavour.
- Tongue disorders are generally diagnosed by physical examination and medical history.

This page has been produced in consultation with, and approved by:

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