

HUMAN ANATOMY AND PHYSIOLOGY-I, BP-101(T)

UNIT-IV (Special Senses)

CLASS:4

TOPIC –Structure, functions and disorders of Tongue

Structure of Tongue

The human tongue is about 3.3 inches in men and 3.1 inches in women. It is located in the oral cavity. The tongue is divided into three parts:

- Tip
- Body
- Base

The tongue is embryologically divided into the anterior and posterior part. The anterior part is known as the oral or presulcal part that includes the root attached to the floor of the oral cavity. While the posterior part is known as pharyngeal or postsulcal part that includes the base forming the ventral wall of oropharynx.

The tongue is made up of three elements:

- Epithelium
- Muscles
- Glands

Epithelium

The epithelium comprises papillae and taste buds. The taste buds help to sense taste. They are lined by squamous epithelial tissue and have a broad bottom.

The taste cells are slender, rod-shaped with a nucleus in the centre. The free surface comprises short taste hair. The taste cells help in detecting taste, which dissolves in saliva for proper sensation.

Muscles

The tongue muscles are voluntary and contain cross-striated muscular fibres.

Glands

The tongue consists of small and scattered glands. These glands are of three types:

- Mucous Glands

- Serous Glands
- Lymph Nodes

The lymph nodes are very prominent at the posterior part of the tongue and are known as lingual tonsils.

Nerve Supply

The glossopharyngeal nerve and the chorda tympanic branch of the facial nerve are responsible for taste sensation. The sensations of pain, touch, temperature are carried by the trigeminal nerve.

Tongue Functions:

Following are the important tongue functions:

1. Mastication

The tongue helps in chewing.

2. Deglutition

It helps in swallowing food.

3. Taste

The tongue transmits taste signals to the brain and helps in sensing taste.

4. Speech

It is an important organ that facilitates speech.

5. Secretion

It secretes mucous and serous fluid which keeps the mouth moist.

6. Salivary Glands

Salivary glands comprise three pairs:

- Parotid
- Submaxillary
- Sublingual

Parotid

It opens on the inner surface of the cheek by the duct of Stensen. It is located opposite the second upper molar tooth.

Submaxillary

It opens by Wharton's duct on the floor of the mouth by the sides of the frenulum of the tongue.

Sublingual

It opens by the ducts of Rivinus on the floor of the mouth by the sides of the frenulum of the tongue.

Anatomy of Gustatory Sensation:

Gustation is the special sense associated with the tongue.

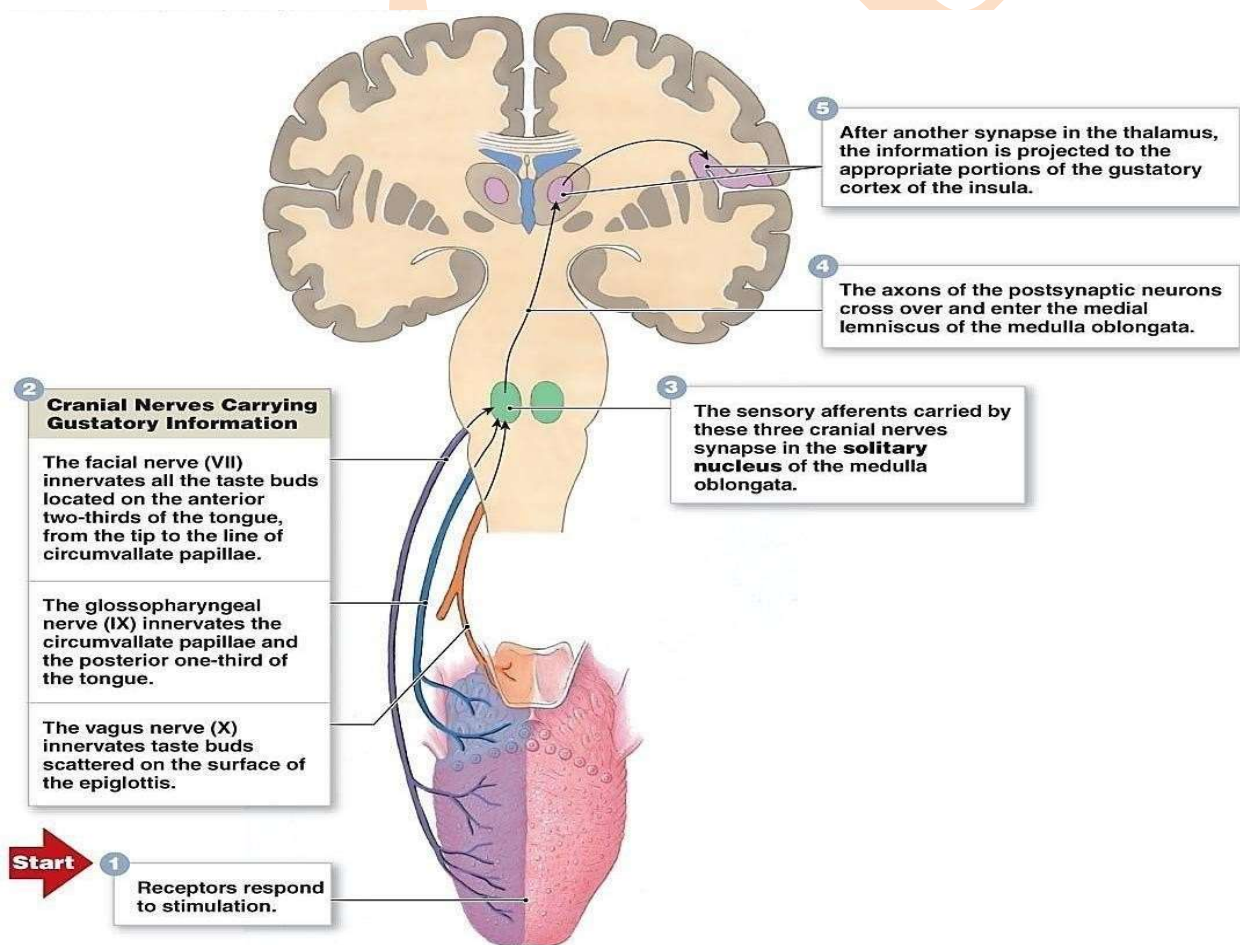
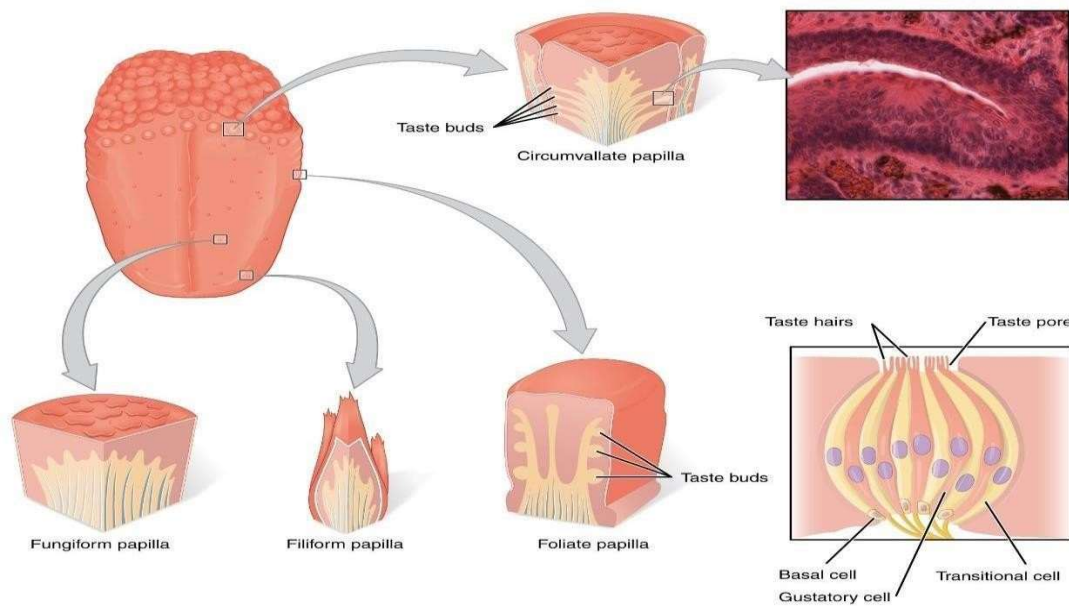
The surface of the tongue, along with the rest of the oral cavity, is lined by a stratified squamous epithelium.

Raised bumps called papillae (singular = papilla) contain the structures for gustatory transduction.

There are four types of papillae, based on their appearance:

1. Circumvallate,
2. Foliate,
3. Filiform, and Fungiform.

Within the structure of the papillae are taste buds that contain specialized gustatory receptor cells for the transduction of taste stimuli. These receptor cells are sensitive to the chemicals contained within foods that are ingested, and they release neurotransmitters based on the amount of the chemical in the food



The gustatory system is much simpler than the olfactory system

Five primary taste sub-modalities are generally recognized:

- Sweet
- Salt
- Bitter
- Sour
- Umami

Sweet

Generally, sweetness is caused by a form of sugar or alcohol. Certain amino acids may also taste sweet

Sour

- Sourness, or tartness, is the taste of acids. It's brought on by hydrogen ions.
- Example of sweet foods include: Vinegar, lemon juice, cranberries, yogurt, buttermilk

Salty

- Saltiness is usually caused by table salt, or sodium chloride, that's added to food. It can also be caused by mineral salts.
- Salty foods include: Soy sauce, processed meat, preserved olives, fries etc ...

Bitter

- Bitterness is due to many different molecules. These molecules are usually found in plants.
- Bitter foods include: coffee, wine, dark chocolate, arugula etc ...

Savory

- Savory taste is caused by amino acids. It's commonly brought on by aspartic acid or glutamic acid. Occasionally, savory is also called "umami" or "meaty."
- Savory foods include: Meat broth, aged cheese, ripe tomatoes, asparagus etc ...

Disorders of tongue:

- Common tongue diseases and problems include canker sores, thrush, oral lichen planus, and tongue trauma.
- Other problems or conditions that can impact the tongue include tongue cancer, transient lingual papillitis, geographic tongue, vitamin B12 deficiency, Sjögren's syndrome, neuralgia, and allergic reactions.

IMPORTANT QUESTIONS:

2M QUESTIONS:

1. Define tongue and explain its functions.

5M QUESTIONS:

1. Draw a well labelled diagram of tongue with its parts and function.

10M QUESTIONS:

1. Draw a well labelled diagram of tongue with its parts and function.

RRCP