Topic 3. Characteristic of lining oral mucosa. Cheek. Lip. Soft palate.

Cheek		
Surfaces (parts)		**Structural features**
1.	**Skin surface**	The outer part covered by skin.
2.	**Basic part**	Base containing striated muscle tissue.
3.	**Mucous surface (buccal mucosa)**	The inner surface covered by lining mucosa. It includes a **stratified squamous nonkeratinized epithelium (1 layer)** with three definite layers (stratum basale, spinosum and granulosum), many elastic fibers in the **lamina propria (2 layer)** and minor salivary glands (buccal glands) in the **submucosa layer (3 layer)**.

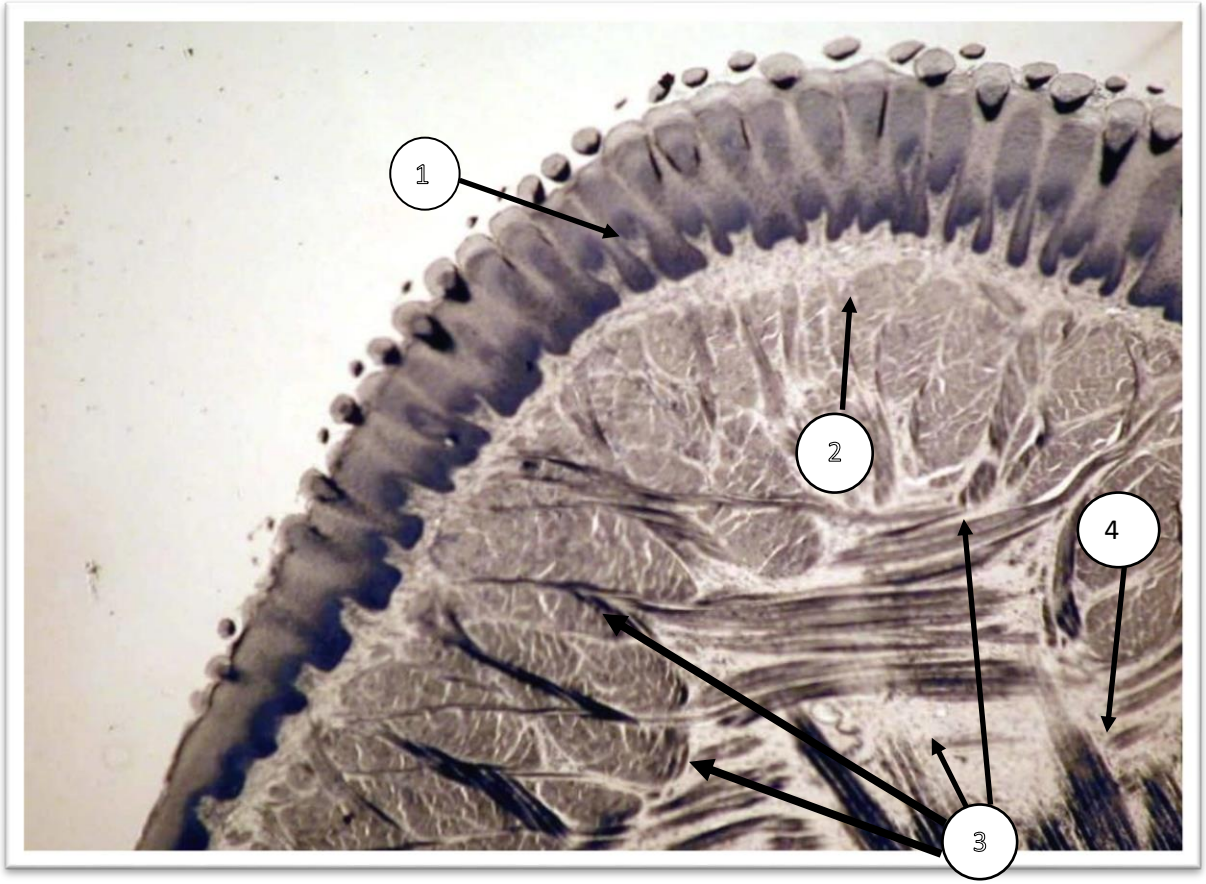
The structure of the mucous surface of the cheek (buccal mucosa)		
Zones		**Structural features**
1.	**Maxillary zone**	1) **stratified squamous nonkeratinized epithelium**, 2) **lamina propria** forms low papillae that go deep into the epithelium and has many collagen fibers, 3) **submucosa** with minor salivary glands and adipose tissue.
2.	**Intermediate zone**	1) **stratified squamous keratinized epithelium** 2) **lamina propria** forms high papillae that go deep into the epithelium and has many collagen fibers, 3) **submucosa without** salivary glands **but** there may be **sebaceous glands**.
3.	**Mandibular zone**	1) **stratified squamous nonkeratinized epithelium**, 2) **lamina propria** forms low papillae that go deep into the epithelium and has many collagen fibers, 3) **submucosa** with minor salivary glands and adipose tissue.

<table>
<tr><th colspan="4">Lip</th></tr>
<tr><th colspan="2">Parts</th><th colspan="2">Structural features</th></tr>
<tr><td>1.</td><td>Pars cutanea</td><td colspan="2">1) stratified squamous keratinized epithelium,
2) lamina propria forms high papillae that go deep into the epithelium,
3) hair, sebaceous and sweat glands.</td></tr>
<tr><td rowspan="3">2.</td><td rowspan="3">Pars intermedia (vermilion border)</td><td colspan="2">Connective tissue and striated muscle fibers. Includes two zones (external and internal).</td></tr>
<tr><td>External (without salivary glands, hair, sweat glands but there may be sebaceous glands)</td><td>1) stratified squamous keratinized epithelium (has thin stratum corneum)
2) lamina propria consists of loose connective tissue and forms papillae that go deep into the epithelium
3) there are nerve endings</td></tr>
<tr><td>Internal</td><td>1) thick stratified squamous epithelium (without stratum corneum) and turns from keratinized to nonkeratinized
2) epithelium forms villi (in newborns)
3) lamina propria does not have glands</td></tr>
<tr><td>3.</td><td>Pars mucosa</td><td colspan="2">1) thick stratified squamous nonkeratinized epithelium
2) lamina propria forms low papillae that go deep into the epithelium
3) submucosa includes collagen fibers in contact with muscle fibers, adipose tissue. seromucous salivary glands and blood vessels</td></tr>
</table>

Soft palate includes lining mucosa, fibrous aponeurosis and muscle fibers		
Parts		**Structural features**
1.	**Velum**	Striated muscle fibers
2.	**Uvula**	Both surfaces are covered by **stratified** nonkeratinized epithelium. Base consists of striated muscle fibers, mucous glands, small tonsil-like structures, connective tissue.

Tab. 1.
https://www.osmosis.org/learn/Anatomy_of_the_oral_cavity_(dentistry)

Surfaces of soft palate		
Surface		**Structural features**
1.	**Side of the oral cavity**	1) **stratified squamous nonkeratinized epithelium** 2) **lamina propria** forms high papillae that go deep into the epithelium and has blood vessels 3) layer of elastic fibers 4) muscular plate is absent in the mucosa 5) **submucosa** includes adipose tissue and mucous salivary glands 6) striated muscle fibers form anastomoses
2.	**Side of the nasal cavity**	1) pseudostratified columnar ciliated epithelium 2) **lamina propria** includes lymph nodes, seromucous and mucous glands 3) **submucosa is absent**



Ventral surface of the tongue. Magnification X 40, iron hematoxylin staining.

Preparation of cross-section of the tongue ventral surface shows a multilayered squamous non-keratinized epithelium (1), which is the first layer of the lining mucousa. Under the epithelium there is lamina propria (2), which is represented by loose connective tissue. The bulk of the thickness of the tongue is formed by striated muscle (3), the fibers of which are located in three mutually perpendicular directions. Between the fibers is the intermuscular connective tissue (4).

VOCABULARY

Outer surface of lip mucosa - is covered by skin with a thin, stratified squamous keratinized epithelium and hair follicles. The orbicularis oris muscle (skeletal) occupies the central core of the lip.

Vermilion border mucosa – is a transitional area between the skin keratinized epithelium and the mucous membrane nonkeratinized epithelium. Long connective tissue papillae deepen into the epithelium. In these papillae capillaries pass close to the surface. Since the epithelium in this area is very thin, the lips look red. There are no salivary glands in the vermilion zone, so the lips need to be constantly moistened (with the tongue) to prevent them from drying out.

Intermediate zone of lip mucosa - thin parakeratinized, stratified squamous epithelium with long irregular papillae, elastic and collagen fibers in connective tissue.

Labial mucosa - the inner surface of the lip is lined by the mucosal epithelium, a thick, moist stratified squamous epithelium; a stratum granulosum is absent. Minor salivary glands (labial glands) are located in the submucosa beneath the lamina propria and produce both serous and mucous secretions. **T**heir ducts empty into the vestibule of the oral cavity.

Buccal mucosa - The buccal mucosa is defined by the epithelium lining the inner surface of the cheeks and lips from the line of contact of the opposing lips to the line of attachment between the alveolar ridge (upper and lower) and the pterygomandibular raphe. There are approximately 800–1000 minor salivary glands located throughout the buccal mucosa. Very thick (500 nm) nonkeratinized, stratified squamous epithelium. Lamina propria with long, slender papillae, dense fibrous connective tissue containing collagen and some elastic fibers, rich vascular supply giving off anastomosing capillary loops into papillae.

Basal layer or stratum basale, is the most profound of the three layers of the mucous membrane. The basal layer consists of a single layer of cuboidal epithelial cells covering the basement membrane, lying over the lamina propria of the mucosa. The basal layer is also called the germinative layer because it shows mitosis of epithelial cells, but this cell division can be seen only under high magnification of the tissue.

Intermediate layer or stratum intermedium. The intermediate layer consists of larger, crowded cells with a

polyhedral shape. These cells seem larger or heavier than the basal layer cells due to the fact that they have a bigger volume of cytoplasm. This layer cells have lost the ability to mitose during migration. The intermediate layer forms the vast majority of nonkeratinized epithelium.

Superficial layer or stratum superficiale. In the mucous membrane it is difficult to recognize the precise division among the superficial layer and intermediate layers. In this layer, even larger analogically composed multilayered epithelial cells are visible, the outer cells of which have a flattened appearance in the form of plates. Cells in these layers show exfoliation or loss as they become mature and die during tissue growth and development. Thus, in this tissue maturation is manifested only in an increase in cell size with their surface migration.

Links:
https://histology.medicine.umich.edu/resources/oral-cavity
https://digitalhistology.org/organs-systems/digestive/oral-cavity/lip
https://www.sciencedirect.com/topics/medicine-and-dentistry/buccal-mucosa
https://openoregon.pressbooks.pub/histologyandembryology/chapter/chapter-3-histology-of-the-oral-mucosa/

TESTS

1. A histologic specimen of **an oral organ** shows that the **anterior surface** of the **organ is covered with stratified squamous epithelium**, and the **posterior surface is covered with ciliated epithelium**. What is this organ?
Soft palate
Gingiva
Hard palate
Lip
Cheek

2. There is a specimen of the **soft palate**, which shows both the **oral and nasal surfaces**. It is found that the **epithelium in the oral cavity is damaged**. Which epithelium is damaged?
Multistratal squamous nonkeratinizing

Multistratal cubical nonkeratinizing
Multistratal prismatic nonkeratinizing
Multistratal squamous keratinizing
Multirowed ciliated epithelium

3. A histological specimen of an oral cavity organ demonstrates that the organ's **anterior surface is lined with multilayer squamous nonkeratinous epithelium,** and its **posterior surface - with multiserial ciliated epithelium**. What organ is it?
Soft palate
Gingiva
Hard palate
Lip
Cheek

4. During the trauma, one of the regions of the mouth was damaged, **it has maxillary, intermediate and mandibular area**. Which organ was damaged?
Cheek
Tongue
Lips
Hard palate
Soft palate

5. Examination of histological preparations of the **oral cavity organ** shows that it has **three parts**: **skin, mucosa and intermediate**. The basis of the structure is formed by striated muscles. What is the structure of the oral cavity?
Lips
Hard palate
Soft palate
Tongue
Gums

6. The **child is feeding on breast milk**. What histological structure of the oral cavity **is adapted to stimulation of the nipple**, which causes the milk production reflex?
Epithelial villi of the lips
Keratinizing stratified squamous epithelium of the lips
Connective tissue papillae of the lips
Mushroom-shaped papillae of the tongue
Foliate papillae of the tongue

7. A newborn has a **defect along the sagittal line of the soft palate**. The physiology of which process will be disturbed?
Swallowing
Chewing
Digestion
Breathing
Articulation

8. A 40-year-old patient suffers from **heart attacks**. The doctor prescribed him to take **nitroglycerin** in a **sublingual** way. What features of the structure of the **oral mucosa primarily determine the possibility of taking the medications**?
Permeability of the stratified squamous nonkeratinized epithelium
Permeability of the stratified squamous keratinized epithelium
Permeability of the stratified squamous epithelium
The presence of papillae of the tongue
The presence of salivary glands

9. **Mucous membrane** preparation is made from the child's **cheek**, in which we identify the **maxillary, mandibular and intermediate zones**. What are the main features that can characterize the **intermediate zone**?
Absence of salivary glands
Absence of sweat glands
Absence of epithelium tissue

Absence of lamina propria
Absence of microvilli

10. Incorrect removal of the **enamel margins** from the second small molar tooth led to its breakage and the formation of **sharp edges that damage the cheek mucosa**. What structures of **cheek were injured**?
Epithelial cells and the lamina propria
Epithelial cells and aponeurosis
Epithelial cells and bone
Epithelial cells and glands
Epithelial cells and muscles

Links:
https://www.testcentr.org.ua/en/exams/all-about-the-exams/about-medical-licensing-exams
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