Methodical Instruction
students’ self – preparation work (at class and at home) in studying Therapeutic Stomatology

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<td>Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
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<td>Content module № 1</td>
<td>“Caries and not carious defeats of teeth”</td>
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1. **Relevance of the topic:** the study of a caries is by one of major problems of a stomatology. This problem has planetary character, as there is no such region, such country, where the carious defeats of teeth would not be the most wide-spread disease causing serious complications not only in jaw-facial area, but also in other bodies and systems of an organism. It is impossible to describe sufferings of the people with cosmetic, speech defects called carious destructions of a dentition.

   The intensity of a defeat of teeth by carious illness constantly grows in the countries with the advanced economy, it is caused by character of a feed, deterioration of an ecological situation, various household intoxications.

2. **Specific goals:**
   - To familiarize with statistical parameters of a tooth caries (epidemiological indexes of caries);
   - To familiarize with modern representations about various aspects and mechanisms of development of a caries.

   To know:
   1. Definition epidemiological indexes of caries: the prevalence, intensity, accretion of intensity (case rate);
   2. Classification of a caries;
   3. The essence, the positive aspects and the disadvantages different theories of a caries development

   To be able:
   1. Calculate the caries prevalence;
   2. Calculate the caries intensity;
   3. Calculate the accretion of caries intensity (case rate);
   4. Classificate the caries according to localization, current, intensity of defeat.

4. **Basic knowledge, experience, skills necessary for studying the topic**
   (interdisciplinary integration)

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<th>Previous disciplines</th>
<th>Skills</th>
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<tr>
<td>Anatomy</td>
<td>Anatomical structure: enamel, dentine, pulp, cement, periodontium ligament, tooth pulp.</td>
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<td>Histology</td>
<td>features of a histological structure of tooth enamel, dentine, cement, pulp, periodontium ligament.</td>
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</table>
### Pathological anatomy
- Pathological changes at an acute and chronic caries of various depth of a defeat.

### Microbiology
- Properties of the microflora of the oral cavity, cariesogenicity factors

### Pharmacology
- The mechanism of action of substances of cariesogenic action and substances having remineralizing action.

### Therapeutic stomatology
- To know equipment of a workplace of the student – stomatologist. Ethics and deontology of stomatological reception;
- To be able to prepare a workplace of stomatological reception to use ethical and deontological principles of job, give a first aid to the patient.

5. **Tasks for independent work during preparation for employment and at the lesson**

4.1. **List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:**

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definition</th>
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<tr>
<td>Caries</td>
<td>is the pathological process, which appears after tooth cutting, characterized with demineralisation of hard tooth tissues and following formation of cavity-like defect.</td>
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</table>
| Statistical parameters of a tooth caries (epidemiological indexes of caries); | 1. Prevalence;  
2. Intensity;  
3. Accretion of intensity (case rate) |
| Prevalence of caries                      | is the index, which determines the percent of persons with caries, fillings and removed teeth among general quantity of inspected persons.       |
| Intensity                                  | average quantity of attacked teeth on one inspected patient.                                                                           |
| Accretion of intensity (case rate)        | intensity indexes’ difference between first and following inspections in one group of patients.                                             |

4.2. **Theoretical questions to the lesson:**
1. The determining of notion «caries» by WHO.
2. Epidemiological indexes of caries.
3. Formula for calculating the caries prevalence;
4. Formula for calculating the caries intensity;
5. Intensity indexes by WHO for 12 years children and adults 35 – 44 years old;
6. Formula for calculating the accretion of caries intensity;
7. Etiology of caries. The role of microorganisms.
8. The influence of factors of external environment on prevalence of caries.
10. The role of dental plaque of pathogenesis of caries.
11. The essence, the positive aspects and the disadvantages chemical - parasitogenic theory of a caries by U.D.Miller.
12. The essence, the positive aspects and the disadvantages Physic - chemical theory by D.A.Entin.
13. The essence, the positive aspects and the disadvantages biological theory by G.I.Lukomskiy.
14. The essence, the positive aspects and the disadvantages the nutritional theory by A.E.Sharpenak.
15. The essence, the positive aspects and the disadvantages the concept of counter influences by A.I.Ribakov.
16. The essence, the positive aspects and the disadvantages the theory of development of a caries by E.V.Borovskiy.

4.3. **Practical work (tasks), which are performed at the lesson:**
1. Calculate the caries prevalence;
2. Calculate the caries intensity;
3. Calculate the accretion of caries intensity (case rate);
4. Classificate the caries according to localization, current, intensity of defeat.

5. **The contents of the topic:**
Caries (lat.-caries dentis) is the pathological process, which appears after tooth cutting, characterized with demineralisation of HTT and following formation of cavity-like defect.

**Epidemiological indexes of caries**
1. Prevalence;
2. Intensity;
3. Accretion of intensity (case rate).

**1. Prevalence of caries** – is the index, which determines the percent of persons with caries, fillings and removed teeth among general quantity of inspected persons.

\[
P = \frac{\text{quantity of pers’s with CFR + cf}}{n} \times 100 \%
\]

where: \( n \) – general quantity of inspected pers’s,
\( C \) – temporary teeth with caries, \( F \) – temporary teeth with filling,
\( R \) – removed temporary teeth; \( c \) – deciduous teeth with caries;
\( f \) – deciduous teeth with filling.

**2. Intensity** – average quantity of attacked teeth on one inspected patient.

\[
I = \frac{\text{CFR + cf}}{n}
\]

**Intensity indexes by WHO:**

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<tr>
<th></th>
<th>Children 12y.</th>
<th>Adults 35 – 44y.</th>
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<tbody>
<tr>
<td>1. Very low</td>
<td>0 – 1,1</td>
<td>0,2 – 1,5</td>
</tr>
<tr>
<td>2. Low</td>
<td>1,2 – 2,6</td>
<td>1,6 – 6,2</td>
</tr>
<tr>
<td>3. Moderate</td>
<td>2,7 – 4,4</td>
<td>6,3 – 12,7</td>
</tr>
<tr>
<td>4. High</td>
<td>4,5 – 6,5</td>
<td>12,8 – 16,2</td>
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</tbody>
</table>
5. Very high > then 6,6 > then 16,3

3. **Accretion of intensity (case rate)** – intensity indexes’ difference between first and following inspections in one group of patients.

\[ AI = I_{\text{last insp.}} - I_{\text{first insp.}} \]

**Classification of caries (worker)**

1. Clinical (topographical).
   - Initial (white, pigmented stain) (macula cariosa)
   - Superficial (c. superficialis)
   - Middle (c. media)
   - Deep (c. profunda)

2. The anatomic
   - Caries of enamel (c. enameli)
   - Caries of dentine (c. dentini)
   - Caries of cement (c. cementi)

3. On localization
   - fissure (c. fissuralis)
   - aproximal (c. aproximalis, c. contactus)
   - in area of neck (c. cervicalis) Circulating (ring)

4. On a current
   - Acute (c. acuta)
   - Chronic (c. chronica)
   - Plural (blooming, system) (c. florida)
   - Secondary (c. secundaria)
   - Stationary (stopped) (c. stationaria)

5. On intensity of defeat
   - The compensated
   - The subcompensated
   - The decompensated

6. On presence of complications
   - Simple (not complicated) (c. simplex, c. incomplicata)
   - Complicated (c. complicata)

**Material for independent work**

In a deep antiquity the attempts were undertaken to reveal the reason of destruction of teeth.

In I c. of our age doctor Skriboniy has stated the assumptions, that the reason of a caries in « bad juices ». He bound this disease to a pathological condition of a stomach, liver, lien and other bodies. In XVII c. there was a chemical theory of a caries, according to which the destruction of teeth occurs as a result of actions of acids getting in an oral cavity.

*The chemical -parasitogenic theory by U.D.Miller, 1884*  
The proved theory of occurrence of a caries suffices to first is the chemic -parasitogenic theory by U.D.Miller (1884), received a wide circulation, as it
reflected the available facts in the field of knowledge of that time on microbiology, chemistry, and also has received experimental acknowledgement.

U.D.Miller was convinced, that the destruction of teeth occurs under influence of microorganisms of an oral cavity and at presence in an oral cavity of carbohydrates. As the beginning of development of carious process he considered formation of organic acids - grape, apple, acetic etc. - in result of acidodairy fermentation of the rests of nutrition. He supposed also influence of acids getting in an oral cavity with foodstuff.

The first stage of development of a caries the demineralization of enamel and dentine owing to appreciable decrease of pH of a stomatic liquid. Thus the enamel completely blasts, as it contains a minimum quantity of organic substance. At destruction of a dentine having appreciable percent of organic substance, there is a second stage - dissolution of an organic part. This process is made at immediate participation of microorganisms, due to influence of proteolytic enzymes.

Alongside with action of bacteria and acids U.D.Miller recognized adverse influence of series of the factors, which he considered contributing. So, he gave the large importance to a salivation, its quantity and quality, to character of a feed (is especial to the contents in water of mineral salts), emphasized meaning of the hereditary factor, conditions of formation of enamel.

The author tried to conhard the theory experimentally: the removed teeth placed in an admixture of a saliva with the well chewed bread and meat, with addition of 2 - 4 % of Saccharum and kept this in a thermostat at t 37\(\degree\)C. After some time the phenomenon of an enamel demineralization was observed which very much reminded changes on teeth in clinic at a caries.

The theory by U.D.Miller had clinical acknowledgement: it explained localization of a caries in retentional items of a tooth by a delay of the rests of nutrition and influence of the superfluous use of sweets. The specified approach defines a direction of prophylaxis of a caries, by elimination of the alimentary rests from an oral cavity and neutralization of a stomatic liquid (in opinion of U.D.Miller, the decrease of pH of a stomatic liquid) took place.

It has served as a subject of the most numerous discussions and criticism, as the reaction of a saliva more often neutral or more alkaline (pH 6,8 - 7,0) fixed, that in norm. Moreover, even at presence of the cariogenic factors (superfluous use of carbohydrates, the unsufficient care of an oral cavity etc.) pH of a saliva does not reach a critical level (pH 4,5 - 5,0), at which the demineralization of enamel of a tooth is possible.

It is necessary to note, that the chemic -parasitogenic theory was not rejected, and having received new clinical, laboratory, experimental data, has got the completed form.

On the conclusion of series of the authors, the chemic -parasitogenic theory in modern treatment most completely opens this process.

The physical-chemical theory (D.A.Entin, 1928)

A lot of attention was given roles of a saliva in development of a caries. One authors considered, that the caries of teeth depends on quantity of a selected saliva, of its structure and pH. Others saw the reason in hyper- of a hypoptyalism.
Summation of all views about a role of a saliva is the theory by D.A.Entin. He has considered carious illness as a consequence of infringement of a local exchange in tooth tissues on ground of frustration of their feed. Enamel of a tooth he surveyed as a semipermeable membrane, which internal surrounding is transsudat of a blood, and outside - the saliva. With change of physical properties of a saliva the permeability of enamel and it charge varies, that defines a direction of osmotic currents. In norm these currents go from a pulp to enamel (centrifugal), providing thus normal feed of hard tissues of a tooth. Under adverse conditions osmotic currents accept a centripetal direction, i.e. come from periphery to a pulp, breaking thus feed of hard tissues and frameing conditions for development of a caries.

The first variant of the theory by D.A.Entin is mechanistic, as the author has reduced all difficult biological processes in an organism to physic-chemical processes.

Later, (1934) D.A.Entin has changed the view to a parentage of a caries. Recognizing a conducting role of the first system in development of carious process, and also series of other systems of an organism (endocrine, hereditary factor, condition of a life and feed), he treated occurrence of carious illness as result of frustration of a feed and infringement of a local exchange in tissues of teeth. Result it is the infringement of physiological mutual relation in system a pulp - tooth - saliva, that frames favorable conditions for dissolution of an inorganic part of hard tooth tissues and of microbic destruction of organic stroma with the subsequent formation of defect (carious cavity).

Thus, occurrence and development of a caries of a tooth D.A.Entin defines by two factors: on the one hand, change of a microstructure of a tooth, and with another - bio-physic-chemical properties of a blood and saliva.

In this period of development of an odontology views of D.A.Entin were progressive, as he recognized a role of series of the general factors in an etiology and cariogenesis, the interrelation between a condition of an organism as a whole and teeth was established.

The biological theory by I.G.Lucomskiy

By the author of this theory the pulp of a tooth, in particular, odontoblasts, is surveyed as trophic center of a tooth.

The enamel is surveyed as an alive tissue having communication with an organism during all life. The various external factors: a disadvantage of vitamins of group B and D, disadvantage and wrong parity of salts of calcium, the phosphorus and fluorine, absence or disadvantage of ultra-violet beams also result in infringement of a metabolism in an organism, in particular mineral. In this connection the trophicity of odontoblasts is broken also, which, in opinion of I.G.Lucomskiy, carry out function of intratooth trophic centers in relation to noncellular formations of enamel and dentine.

I.G.Lucomskiy proceeded from the doctrine of I.P.Pavlov that each body is under the triad control of nervous system. » The Functional nerves cause or interrupt functional activity of a body: reduction of muscles, secretion of glands etc. The Vascular nerves adjust rasping delivery of a chemical material and removal of dross.
The trophic nerves define in interests of an organism as the whole final size of use of this material by each body.

Owing to infringement of a metabolism on ground of nutritional and other factors the odontoblasts become incomplete (the size them and quantity decreases, wrinkl a core). The function them is broken, that results in infringement of a metabolism in enamel and dentine. The communication between organic and mineral substances is broken. There are in the beginning qualitative changes (dismineralization), which result to quantitative (the quantity of salts of a calcium and phosphorus decreases and the contents of magnesium is enlarged), comes hypomineralization (hypocalcination and decalcification), enamel and dentine with formation of a site of a softening or cavity.

This point of view of I.G.Lucomskiy can not explain series of the moments. For example, at a caries not weakening, but intensifying of function of odontoblasts expressing in formation of a secondary dentine is observed. At parodontose changes in odontoblasts (atrophy or disappearance of a layer) often are observed, but there is no caries.


The author considered a caries as polyetiological disease, on the ground that the infringements of a metabolism can be called by the various factors. However, basic of them, in his opinion, is nutritional, is especial in case of the unsufficient contents in nutrition of albumines and irreplaceable aminoacids (lysine, arginine) and thus increased carbohydrates. It causes the increased need of an organism for vitamin B1 and accumulation in tissues of a grapes acid. After achievement of the certain concentration the grapes acid accelerates process of a proteolysis in tissues of teeth and causes thus formation of a caries.

In occurrence and development of a caries of teeth A.E.Sharpenak offered to distinguish two phases.

In the first phase in tissues of teeth as a result of infringements of an exchange develop distrophycal processes, that occurs without participation of bacteria. This phase comes to an end by occurrence of a white spot. Thus he considered, that infringement of a metabolism, which are based on carious changes, begin not with a decalcification, and from a defeat of an organic component of enamel. Main among these infringements there are processes of a proteolysis, which result in destruction of an albuminous component of enamel. In the second phase of carious process in extended after a proteolysis of interprizmical space of enamel the bacteria will penetrate which continue destruction of hard tissues of teeth.

However there are a lot of positions of this theory have not found the further experimental and clinical acknowledgement. It concerns the thesis about an only centrifugal direction of penetration of nutritious substances in enamel, denying of a role of microorganisms in a demineralization of enamel, exaggeration of importance of proteolisis. By this theory it was difficult to explain favourite localization of carious cavities, frequency of defeats of teeth by a caries and other positions, at which the large influence have the local factors.

The working concept of a caries of teeth by A.I.Ribakov (1973)
It was named « as the concept of counter influences on a pulp of a tooth ». It is based on revealing of influence of the various endogenic and exogenous factors on formation, function and frame of tooth tissues. The large meaning is given to revealing of interrelation teeth - gnathic system with other bodies and systems of an organism. The author considered, that the reason of development of a caries is changes in a pulp, which under action exogenous and endogenic of pathogenic stimulus realizes the influence on hard tissues of a tooth. It is provided, that the pathological changes - infringement of formation of enamel and dentine - begin from middle and are distributed to a surface of enamel. Further sites of tissues with display of any structural infringements are those the least steady sites (locus minoris resistantis), in which under influence of the adverse factors of external surrounding, and also pathological pulses from internal surrounding of an organism the primary centers of pathological process develop.

Depending on a stage of development of an organism of the man A.I. Ribakov allocated the basic endogenic and exogenous factors, which interaction in the different periods of an ontogenesis results in occurrence of carious process.

Thus, allocate in an ontogenesis the following periods:

I - praenatal.

In this period the large importance have the genetic factors, a background for its further development can be infringements of process of an odontosis, is especial enamels and dentine. From the exogenous factors in this period matter an incomplete feed of the mother, reception of some medicines, deficiency in an organism of some trace substances, first of all fluorine and magnesium, harmful habits of the mother, her diseases.

II - period of childhood.

First phase (6 month - 6 years)

A background for development of carious process can be the transferred diseases with simultaneous influence of the local damaging factors (bad care of an oral cavity, deformation of an occlusion, trauma).

Second phase (6 - 11 years)

The pathogenic factors are an overload by carbohydrates of the insulin device, disadvantage of fluorine in an organism, infringement of a salivation and change of pH of surrounding of an oral cavity.

Third phase (12 - 14 years)

Is characterized by the most appreciable reorganization of an organism, its systems and internal bodies. More often background is infringement of a puberty, the tooth plaques matter, by a releaser the hormonal reorganization of an organism acts.

Fourth phase (14 - 17 years)

Matter intensity of an exchange of trace substances (especially fluorine), labored eruption of teeth and hormonal infringements.

Fifth phase (17 - 20 years)

The certain nosotropic(pathogenetic) role can be played by infringements of function of a liver, of the insulin device. Among the local damaging factors the inherent and acquired diseases of teeth - gnathic system (anomaly of an occlusion, deformation of jaws and other matter.).
III. The period of optimum physiological equilibriums of functions (20 - 40 years)

Among the factors the promoting occurrence of a caries, prevail somatopathies, presence of diseases of teeth - gnathic system (labored eruption of the third molar teeths, deformation of jaws, infringement of an occlusion, trauma of teeth).

the period of a withering of functions of an organism (40 and more than years)

IV. Is characterized by decrease of functional activity of sexual glands, infringements of activity of other endocrine glands and changes, specific to the given age. The local factors are traumas of teeth, disease of an oral cavity; by a releaser - factors working locally, and also infringement of a feed.

In the given concept causes objection very much plenty of the factors, which the author allocates as etiological for occurrence of a caries. They are the factors faster, which promote its occurrence. There are no concrete indicatings on the mechanism of development of a caries, which is practically uniform. On this is not clear, how such quantity of the ethnological factors causes morphological pathological changes, which in the same way show themselves.

Modern representation about the reason of occurrence of caries in light of the concept by E.V.Borovskiy.

Now is conventional, that at an initial stage of a caries in the center of a defeat there is an expressed demineralization of enamel. Thus the most appreciable changes are marked in a undersuperficial layer. An immediate cause of occurrence of the center of a demineralization in a carious spot are organic (basically dairy) acids formed in process of fermentation of carbohydrates by microorganisms of a debris. It is necessary to note, that this demineralization of enamel differs from a demineralization at entering an acid from the outside: at a white spot the demineralization takes place undersuperficial, and at influence of acids there is a gradual loss of enamel on all of its surface.

By treating dynamics of occurrence of a caries of a tooth the variety of the various factors pays attention, which interaction and causes occurrence of the center of a demineralization. Basic of them are: a microflora, character of a feed, regimen of a feed, its quantity and quality, function of a salivation (remineralizing action of a saliva, buffer properties, secretory immunoglobulins, lysozyme), shifts in a functional condition of bodies and systems of an organism, contents of fluorine in drinking water, extreme influences on an organism (radial influence, influence of an environment).

The factors causing occurrence of a caries of teeth, are divided on local and general. Besides in occurrence of caries the important role belongs to a condition of hard tissues, their resistance.

The local factors include microorganisms of a debris, infringement of structure and properties of a stomatic liquid; the carbohydrate alimentary rests.

To the general factors concern: a diet, including contents of fluorine in water, shifts in a functional condition of bodies and systems of an organism, extreme influences.
The action of the cariogenic factors is possible to understand, if a normal condition of enamel to survey as dynamic equilibrium between constantly proceeding processes of de- and remineralization.

At creation of conditions, when the processes of a demineralization prevail above processes of a remineralization, there is a site of a demineralization as a carious spot. Further progressing of process of a demineralization of enamel and dentine results in formation of a carious cavity of this or that depth. At a favorable situation in an oral cavity (careful erosion of a debris, decrease of consumption of carbohydrates, keeping of a regimen of a feed etc.) the conditions for a remineralization of enamel are frameed and the process is stabilized. In one cases the white spot can completely disappear, in others it turns to a pigmented spot, which can be characterized as stabilization of process (it for a number of years does not turn to a carious cavity).

Occurrence of an initial caries E.V.Borovskiy represents as follows. Owing to the often use of carbohydrates and unsufficient care of an oral cavity cariogenic microorganisms are densely fixed on a pellicula, forming a debris. The further entering of carbohydrates (the saccharose, fructose) results in local change of pH on a surface of enamel of a tooth reaching critical level 4,5 - 5,0. At long maintenance of a critical level of hydrogen ions there is a dissolution of apatites of a surface in the least steady sites of enamel (line by Retzius, interprizmical spaces), that results in penetration of acids in an undersuperficial layer of enamel and its demineralization. The changes of a superficial layer of enamel are less expressed, than deep layers caused by its structural features (presence of a plenty fluorinapatites), and as by constantly occurring processes of a remineralization at the expense of continuous entering of mineral components from a stomatic liquid. The proceeding formation of organic acids on a surface of enamel results in a demineralization and gradual augmentation of microspaces between crystals of enamel prizms. As a result of it the conditions for penetration of microorganisms into the formed microdefects are frameed. In a result the source of formation of acids is transferred inside of the enamel. At this stage of development of carious process the demineralization of enamel is distributed as along its surface, and inside, forming the cone-shaped center of a defeat. The long existence of the center of a demineralization results in dissolution of superficial, steadier layer of enamel.

6. Self-monitoring materials:

A. Test with the only correct answer

1. Pathological process of an obscure aetiology which is shown after a teething and is characterised demineralization of firm tooth tissues with following formation of defect in the form of a cavity:
   A) Enamel erosion;
   B) Traumatic damage of a tooth;
   C) Clinoid defect;
   D) Tooth caries;
   E) Fluorosis.
2. An index which defines % of the people having a carious, the sealed up or extracted teeth among certain quantity of the surveyed patients in certain territory, in a city, settlement:
   A) PMA;
   B) Prevalence of caries;
   C) Green-Vermiliona hygienic index;
   D) Intensity of caries;
   E) SPITN.
3. High degree of intensity of caries in age group of 12 years childrens is defined by an indicator:
   A) 0,2-1,5;
   B) 1,6-6,2;
   C) 6,3-12,7;
   D) 12,8-16,2.
   E) Above 16,3;
4. The difference between an indicator of intensity of caries in the same group, defined through a certain time interval makes:
   A) Intensity of caries;
   B) Pathogenesis of caries;
   C) Prevalence of caries;
   D) Gain of intensity of caries;
   E) All answers true.
5. Average quantity of the teeth struck with caries on one surveyed patient it:
   A) Prevalence of caries;
   B) Intensity of caries;
   C) Gain of intensity of caries;
   D) Plural caries;
   E) All answers true.
6. The indicator of moderate degree of intensity of caries in age group of 35-44 years is equaled:
   A) 0,2-1,5.
   B) 1,6-6,2;
   C) 6,3-12,7;
   D) 12,8-16,2.
   E) Above 16,3;
7. More often the demineralization of firm tooth tissues happens in area:
   A) Cutting edge of a tooth.
   B) Tooth fissures and its natural deepenings;
   C) Chewing tubercle;
   D) Contact surfaces;
   E) Truly B, D.
8. From the listed factors which influence level of resistance of an organism to carious process is:
   A) Dental deposit;
B) The general diseases of an organism connected with infringement of exchange processes in an organism;
C) Carbohydrates;
D) Insufficient contents of fluorine in potable water;
E) Specified all above.
9. On localisation distinguish such form of caries:
   A) Fissure;
   B) Contact (aproxymal);
   C) Near the neck;
   D) The circular;
   E) All answers true.
10. Geographical factors which influence prevalence and intensity of caries of a tooth:
   A) Climate;
   B) Solar activity in region;
   C) The content in a ground and potable water of mineral components (calcium, phosphorus);
   D) The content in a ground and water of microcells (fluorine);
   E) All answers true.

B. Question for knowledge control
1. What kinds of a caries distinguish depending on depth of a defeat?
2. What kinds of a caries distinguish depending on current?
3. What kinds of a caries distinguish depending on defeat tissure?
4. What kinds of a caries distinguish depending on intensity?
5. How are named complications of caries?

C. The test task with multiple choice of answer and explanation
What is the concrete cause of development a caries in a stage of a light spot?
1. Formation of a tooth plaque on a pellicula of a tooth from carbohydrate of the rests, microorganisms, epithelial cells.
2. Local changes of pH of surrounding under a tooth plaque up to a critical level - 4,5 - 5,0
3. Dissolution of apatites of a surface of enamel in interprizmical spaces (in the field of a line by Retzius).
4. Penetration of acids in an undersuperficial layer of enamel and its demineralization.
5. Long reception of antibiotics at therapeutic diseases.
6. Increased salivation.
7. Prevailation in a ration of albuminous and fatty products.

The test task with multiple choice of answer and explanation
What combination of the factors is necessary for development of carious defect?
1. Presence in an oral cavity of acidophilic microorganisms.
2. Increased contents in drinking water of fluorine.
3. Ability of microorganisms to form organic acids (dairy) at a fermentation of carbohydrates.
4. Prevailation of carbohydrates in a diet.
5. High resistance of superficial layers of enamel from blasting influences.
6. Unsatisfactory hygienic condition of teeth.
7. Amplified function of sialadens.

7. Recommended literature

Base:
9. Lecture material on discipline “Therapeutic Stomatology”.

Additional:


Information resources on the Internet:

- http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the the candidate of medical sciences, docent Marchenko Irina Jaroslavovna
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

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1. **Relevance of the topic:** There are many authentic facts that deny the influence of environmental factors, the nature of nutrition, past and concomitant illnesses on the caries development. Therefore, a number of scientists devoted a lot of time to studying the issue of the resistance of hard tooth tissues and its importance for the stability of teeth to the effects of aggressive factors. To date, this issue has been well studied by scientists and the importance of structural and functional resistance of solid tooth tissues to maintain the integrity of dental tissues has been proven.

2. **Specific goals:**
   - To familiarize with notion of caries resistance;
   - To familiarize with modern representation about various aspects and mechanisms of development of a caries.

To know:
1. Types of dental hard tissues resistance
2. Factors which provide the structural resistance of hard tooth tissues
3. Factors which provide the functional resistance of hard tooth tissues

To be able:
2. Evaluate of the enamel resistance test

3. **Basic knowledge, experience, skills necessary for studying the topic (interdisciplinary integration)**

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To know equipment of a workplace of the student – stomatologist. Ethics and deontology of stomatological reception;
To be able to prepare a workplace of stomatological reception to use ethical and deontological principles of job, give a first aid to the patient.

4. Tasks for independent work during preparation for employment and at the lesson

4.1. List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:

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<td>Caries resistance</td>
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</tr>
<tr>
<td>Permeability</td>
<td>ability of HTT to absorb different substances</td>
</tr>
<tr>
<td>Solubility</td>
<td>ability of enamel to resist an acid etching</td>
</tr>
<tr>
<td>ERT</td>
<td>Enamel resistance test</td>
</tr>
</tbody>
</table>

4.2. Theoretical questions to the lesson:

1. Definition of caries resistance
2. Types of dental hard tissues resistance
3. What does factors provide the structural resistance of hard tooth tissues?
4. What does factors provide the functional resistance of hard tooth tissues?
6. Evaluation of the enamel resistance test

4.3. Practical work (tasks), which are performed at the lesson:

1. Make the definition and evaluate the test of enamel resistance

5. The contents of the topic:

Borovskiy E.V. and Leus P.A. formulated a view according to which caries resistance is determined by the optimal chemical composition, type of mineralization, the complete structure of the enamel, in particular its surface layer.

With the notion of caries resistance, the concepts of solubility and permeability are closely related. Permeability – is the ability of the enamel and hard tooth tissues to absorb various substances. Using radioactive isotopes (labeled atoms) it has been proved that solid tooth tissues penetrate both in the centrifugal and centripetal directions for inorganic substances and amino acids. Today it is proved, that enamel is
permeable from 2 sides: pulp and saliva. Due to this fact HTT is get mineral substance during its development as from pulp, as from saliva. After tooth eruption during of several years there is a definitive mineralization of enamel, thanking remineralizational properties of a saliva. But a tooth can be permeable and for microorganisms and products of their vital functions (the same dairy acid).

Solubility (acid resistance) – is the ability of enamel to withstand the acidic etching. Distinguish structural and functional acid resistance. Structural acid resistance is determined by the state of inorganic and organic structures of enamel. The main mineral component of the enamel is hydroxyapatite. Molar ratio of calcium and phosphorus = 1.3 - 2.0. It is established that the higher the ratio of Ca / P exceeds the minimum, the higher the ability of hydroxyapatite to withstand the action of acids. The solubility of the enamel is significantly reduced by the action of such a universally recognized anticaries factor, such as fluorine.

The functional acid resistance of the enamel is determined by the movement of the tooth liquor, controlled by the tooth pulp. It moves along the dentinal tubules, in the thicker enamel on the interprismatic intervals and extends to the surface of the enamel. The speed of its movement (according to Okushko V.R.) 4 mm / hour in dentin and 1 mm / hour in enamel. His movement is quite significant - a ten-time exchange is taking place. At alkaline pH, rising to the surface of the enamel, the tooth liquor neutralizes the acids formed under the dental plaque, thus, carrying out its anti-cariogenic effect.

Functional acidity strictly depends on the state of the pulp. Any methods activating bioelectric activity increase the centrifugal (from the pulp) permeability, and hence acid resistance. On the contrary, when the bioelectric activity of the pulp decreases, the acid resistance decreases (for example, the isolation of the enamel area from the pulp by means of depulpiting or opening of the dentinal tubules always leads to a significant decrease in the microhardness and acid resistance of the enamel).

To determine the structural and functional acid resistance of teeth, a TER test – test of enamel resistance is used. There are various modifications of this method (VR Okushko, LI Kosareva, 1983), but its essence is reduced to one: on a cleared from a
plaque, dried and isolated from saliva, the vestibular surface of the upper central incisor at a distance of 2 mm from the cutting edge a drop of HCl in a concentration of 1 H (1 normal solution) with a diameter of 1-2 mm is applied in the central line. After 5 seconds, the drop is washed with water. Then apply a drop of 1% solution of methylene blue, which is removed with a dry swab. The spot on the place of application of acid is painted in blue, the intensity of which depends on the depth of the penetration of acid and etching. The color is compared to a ten-letter print scale of blue color. On the basis of the ballroom assessment risks groups are formed. When coloring the area with the intensity of 1-3 points, patients have high caries resistance, 4-5 points - moderate, 6-7 - lowered, and more 8 - low.

6. Self-monitoring materials:

A. Test with the only correct answer
1. After carrying out of the TER-test the enamel surface has got pale blue colour that is characteristic for:
   A) Low degree of resistance of enamel;
   B) Average degree of resistance of enamel;
   C) Considerably low degree of resistance of enamel;
   D) High degree of resistance of enamel;
   E) Moderate degree of resistance of enamel.
2. Property of enamel to resist to acid influence from an oral cavity, acidulation, name:
   A) Microdurability of enamel;
   B) Solubility of enamel;
   C) Demineralization of enamel;
   D) Permeability of enamel;
   E) All answers are true.
3. Property of enamel and firm tooth tissues to absorb various substances is called:
   A) Solubility of enamel;
   B) Acid fastness of enamel;
   C) Microdurability of enamel;
   D) Demineralization of enamel;
   E) Permeability of enamel.
4. Speed of movement tooth liquor in dentine makes:
   A) 1 mm / hour;
   B) 2 mm / hour;
   C) 3 mm / hour;
   D) 4 mm / hour;
   E) 5 mm / hour.
5. Maintenance constant pH in an oral cavity is provided:
A) Buffer property of a saliva;
B) Humidifying property of a saliva;
C) Digestive function of a saliva;
D) In saliva volume;
E) Articulation function of a saliva.

6. Caries-static action tooth liquor is provided:
   A) Antimicrobial activity;
   B) Humidifying of a surface of enamel;
   C) Trophy of a tooth hard tissues;
   D) Neutralization of acids which are formed under a tooth plaque;
   E) Movement change of liquor in a direction to a tooth pulp.

7. After carrying out of the TER-TEST the enamel surface has got dark blue colour that is characteristic for:
   A) Very low degree of resistance of enamel;
   B) Average degree of resistance of enamel;
   C) Considerably low degree of resistance of enamel;
   D) High degree of resistance of enamel;
   E) Moderate degree of resistance of enamel.

8. Neutralization of acids which are formed under a tooth plaque, happens for the account:
   A) Oral liquid;
   B) Liquids a gingival fillet;
   C) Saliva;
   D) Tooth liquor;
   E) All answers are true.

9. What substance is used for TER-TEST carrying out:
   A) 1H a solution of hydrochloric acid and methylene dark blue;
   B) 3 % a solution of peroxide of hydrogen and methylene dark blue;
   C) 37 % a solution of ortophosphoric acids;
   D) 2H a solution of hydrochloric acid and methylene dark blue;
   E) 10 % a solution of maleiny acids and methylene dark blue.

10. Speed of movement tooth liquor in enamel makes:
    A) 1 mm / hour;
    B) 2 mm / hour;
    C) 3 mm / hour;
    D) 4 mm / hour;
    E) 5 mm / hour.

11. During preventive examination of a 19-year-old man it was revealed that there are carious lesions in the fissures of the 37 and 47 teeth, sealant is fully retained in the 16 and 26 but absent in the closed intact fissures of the 36. The 46 was extracted due to complicated caries. Determine the degree of caries in this patient:
    A). 3
    B). 6
    C). 5
    D). 4
7. Recommended literature

**Base:**
9. Lecture material on discipline “Therapeutic Stomatology”.

**Additional:**
Information resources on the Internet:
- http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the the candidate of medical sciences, 
docent Marchenko Irina Jaroslavovna
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

<table>
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<tr>
<td>Content module № 2</td>
<td>“Caries and not carious defeats of teeth”</td>
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Course III
Faculty Stomatological
1. **Relevance of the topic:** The topic basis: the caries of teeth is the most wide-spread disease among the population of all age groups. The complications caused by a caries, result in appreciable infringement of chewing efficiency, that is shown subsequently by various pathology of a gastrointestinal path and infringement of many kinds of a metabolism. The cosmetic defects at carious defeats often are the reason of many moral torments and psychoemotional traumas of the patients. It is logical, that the knowledge of displays of a caries at its different stages is necessary for the future doctors-stomatologists for successful diagnostics, effective treatment and reliable prophylaxis of most mass stomatological disease.

2. **Specific goals:**

Get to know the clinical manifestations and principles of diagnostics an acute and chronic initial caries

To know:

1. Pathomorphological changes that are characteristic of the acute and chronic caries in a stage of a spot;
2. Clinic of an acute and chronic caries in a stage of a spot;
3. Main differential signs of an acute and chronic caries in a stage of a spot.

To be able:

1. To diagnose the various forms of initial caries on the basis of the given subjective and objective methods of inspection;
2. To spend differential diagnostics of the acute and chronic initial caries with other forms of a caries, not carious defeats.

3. **Basic knowledge, experience, skills necessary for studying the topic** (interdisciplinary integration)

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4. Tasks for independent work during preparation for employment and at the lesson

4.1. List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:

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<td>Initial caries (macula cariosa)</td>
<td>is a pathological process which is characterized by demineralization of subsuperficial and central layers of enamel with formation of cosmetic defect in the form of a chalk or pigmented spot (without cavity).</td>
</tr>
<tr>
<td>Subjective examination</td>
<td>Obtaining information from the patient's words by questioning or writing a questionnaire</td>
</tr>
<tr>
<td>Objective examination</td>
<td>The main method of studying the patient, consisting in obtaining data about the patient and his ailment through the use of the visual, auditory organs, tactile sensation, etc., and special laboratory, clinical analyzes</td>
</tr>
<tr>
<td>Caries - marking</td>
<td>Additional research method of tooth hard tissues by dyeing tissues with special dyes allowing to identify areas of demineralization and decay</td>
</tr>
<tr>
<td>Luminescent and transilluminating diagnostics</td>
<td>Additional method of examining the tooth with the help of special light that allows to identify areas of demineralization, cracks, fractures, decay</td>
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4.2. Theoretical questions to the lesson:
1. Pathomorphology of a caries in a stage of a light spot;
2. Pathomorphology of a caries in a stage of a pigmented spot;
3. Clinic of acute initial caries;
4. Clinic of chronic initial caries;
5. Differential diagnostic of acute and chronic initial caries;
6. Differential diagnostic acute initial caries and spotty form of fluorosis;
7. What additional methods for diagnostics acute initial caries are more informative?
8. A technique of applicational remineralizing therapy of caries in a stage of a chalky spot;
9. Treatment methods for caries in a stage of a pigmented spot;
10. Remineralizing therapy of a caries in a stage of a chalky spot with use of electrophoresis;
11. General therapy for prevention and treatment of an acute initial caries in patients with high caries intensity;
12. Diet therapy for prevention and treatment of an acute initial caries;
13. Vitamin therapy for prevention and treatment of an acute initial caries;
14. Stimulation of function of salivary glands at treatment of acute initial caries;
15. Use of UVR at treatment of an acute initial caries.

4.3. **Practical work (tasks), which are performed at the lesson:**
1. Perform a subjective examination of a dental patient with initial caries: to clarify complaints, to collect anamnesis of illness and life.
2. Perform a objective examination of a dental patient with initial caries: survey, probing, percussion, palpation.
3. Perform caries-marking (vital coloring) an acute initial caries.
4. To diagnose the various forms of initial caries on the basis of the given subjective and objective methods of inspection;
5. To spend differential diagnostics of the acute and chronic initial caries with other forms of a caries, not carious defeats.
6. Carry out demineralized therapy for acute initial caries treatment
7. To appoint the general therapy for prevention and treatment of an acute initial caries in patients with high caries intensity.

5. The contents of the topic:

**Pathomorphology of an acute initial caries (stage of a light spot)**

At microscopical research of sections of teeth with an acute initial caries, as a rule, the brightly painted zone of a defeat with continuous, sharply expressed, even till segmentation, transversal stription of prisms and extended, evenly or variously, interprismical intervals is defined.

In a stage of a light spot in enamel at a polarizing microscopy the center of a defeat as a triangle is taped, which basis is inverted to an outside surface of enamel. The character of change in a site of a defeat depends on the sizes of a spot. At a defeat, which area does not exceed 1mm², on sections of teeth are taped a transparent and dark zone. In a layer of subject enamel, enamel-dentin junction and dentine the changes are not found out. It is necessary to note, that in an outside layer of the center of a defeat there are weakly expressed changes.

*In the basis of* pathological process is demineralization of an enamel layers, which begins on so-called lines by Retzius (regions the least degree of a mineralization of enamel). But feature consists that subsuperficial and the central layers of enamel are exposed to demineralization to the greatest degree. And the outside layer remains enough mineralization that explains saliva activity.

S.P.Onishchenko and V.P.Zenovsky have secured 5 layers of a lesion:

1. The superficial region, is characterized by the greatest stability;
2. The subsuperficial, in which reduction of the content of calcium in comparison with norm is observed; the volume of microspaces is enlarged to 14 % at norm of 1 %. Permeability of an enamel sharply increases;
3. The central region (lesion body) – region of maximum changes. The volume of microspaces is enlarged to 20-25 %;
4. The intermediate region;
5. The intrinsic (region a lustrous enamel) - region the relative well-being.
Fixed, that at all stages of development of carious process density of the certain zones of enamel decreases, that specifies the phenomenon of a demineralization.

In various sites of white and pigmental maculae method of electron microprobing fixes decrease of the contents of calcium, phosphorus, fluorine and other mineral substances. On the data of some authors the loss of calcium in center of the carious defeat reaches 20-30%.

There was earlier opinion, that in a carious spot the contents of a protein decreases. However, recently fixed, that its quantity is enlarged at the expense of accumulation in a spot of soluble protein penetrating into the center of a carious defeat.

The numerous electronic-microscopically researches of enamel at various stages of development of a carious spot have revealed changes in crystals: infringement of orientation of crystals in frame of hydroxyapatites, change of the form of crystals, their sizes, revealing of crystals, not typical of normal enamel. There is a direct dependence between the size of a carious spot and contents of calcium and phosphorus in it: with augmentation of the sizes of a carious spot the degree of a demineralization of enamel is enlarged.

After occurrence of the center of a demineralization, clinically described by presence of a white carious spot, in the further process can penetrate by two ways. In the first case, under condition of further progressing of a demineralization, the outside layer, which due to some factors long time remained with certain changes, is blasted and there is a defect within the limits of enamel of a tooth. It is necessary to emphasize, that thus in layers of enamel on border from dentin the morphological changes can be absent. In the second case the process has longer current. In this case at a polarizing microscopy the changes are taped, fascinating all thickness of enamel: at the saved outside layer the zones, characteristic for the center of a carious defeat (body of a defeat, dark and transparent zones) are well visible. It is important to note, that dentin-enamel junction and dentine thus remain constant. Clinically this phase of morphological changes is characterized by
presence of a pigmented light brown spot. Till now there is no precise representation about the reason of a spotting of the center of a demineralization in brown and even black color. One authors consider, that penetrated in enamel organic substances in result of oxidizing-restoration processes turn in melanicterous, as causes a spotting. R.G.Sinitcin explained a pigmentation of the center of a demineralization by accumulation of amino acid terazin, which further turns to a pigment melanin.

From the given data follows, that the caries at a stage of a white and pigmented spot is an undersuperflitious demineralization of enamel, which proceeds in the beginning at uninjured deep layers of enamel and dentin-enamel junction. Thus the outside layer of enamel above the center of a defeat is less changed, than deep layers. Consider, that the long conservation of an outside layer of enamel is caused by two reasons: by structural feature of an outside layer, and main, process of a remineralization, which is always observed in an oral cavity. The further demineralization results in change of dentin-enamel junction, dentine.

Pathomorphology of a chronic initial caries (stage of a pigmented spot).

At a chronic initial caries (the stage of a pigmented spot) enamel is struck within the limits of a spot or in an environment of a cavity, is intensively painted and has two zones. The external zone pigmented more strongly, in it a prisms are non-uniform, ground off, segmented, the interprismical substance especially dark and consists from globules. Sometimes it is impossible to distinguish a structure of enamel that a spotting so intensive. The central zone is more light, with precisely seen frame, in separate places transversal striping of prisms is defined, but it is shown much more weakly, than at an acute caries. On periphery it is visible a continuous zone of transparent light enamel expressed more intensively, than more intensively pigmentation in the designated above zones. Sometimes strip interrupts and then the pigmented enamel as tongue is distributed up to dentin-enamel junction.

In a dentine the same changes are defined, as at an acute caries, but they are shown differently. The layer of a transparent dentine considerably more massive,
as an appreciable layer of a dentine with dark canaliculus, on the part of the pulpal chamber often is taped a secondary dentine.

**Clinic of acute initial caries**

- **Complaints:** on cosmetic defect in a view whitish maculae various shades, inappreciable sensitivity from chemical irritates (acidic, sweet, bitter).
- **Anamnesis of diseases:** causal tooth earlier it is not treated, complaints have occurred several weeks ago
- **Objective examination of a place of disease:**
  - *At survey* - whitish, opaque macula small dimension with accurate borders. This maculae can be defined on any, accessible to survey surfaces, except for a place of the most frequent localization of caries lesions - at the bottom of sulcus and proximal surfaces of teeth.
  - *At probing* the smooth surface of these maculae, painlessness is defined.
  - *A vertical and horizontal percussion* and a mucosa palpation in range of projection apexes of a root of tooth are painless.
  - A thermo diagnostic painless or inappreciable short-time painful sensitivity.
  - EOD: 2-6 mkA.
  - Maculae are imbued by 2 % solution of the methylene dark blue.

**Clinic of chronic initial caries**

Difference:

- Complaints at presence dark stain, if it is localized on places accessible to its survey. Complaints often are absent, as the pain or sensitivity from irritants does not arise. Caries often find out at routine inspection.
- Long current. Development of this caries can stop.
- *At survey* the dark stain of various shades - from light brown to black in typical places for localization of caries defeats is defined.

**Differential diagnostics of a caries in a stage of a spot.**

The carious spot should be differentiated from a spot at a hypoplasia and fluorosis. The symmetry of a defeat of the same teeth is characteristic for a hypoplasia, that is caused by a simultaneity of their creation, development and
mineralization. At a fluorosis are available multiple, and white, and brown, not having of precise borders of a spot locating on surfaces of all groups of teeth. The localization of maculae does not correspond to retentional sites of a surface of a crown of a tooth, where carious defeats are localized more often. At the high contents of fluorine in drinking water the size of maculae is enlarged, and the character of changes is more expressed: the enamel of all crown of a tooth can have brown color. The endemicity of a defeat - display at all or majority of the inhabitants any of region is characteristic for a fluorosis.

**Principles of local treatment of acute initial caries**

The light and light brown spot is display of a progressing demineralization of enamel. As have shown experimental and clinical researches similar changes can arise at the expense of entering of mineral components in the center of a demineralization. The specified method has received the name of remineralizing therapy. Series of preparations presently are created, which structure includes ions of calcium, phosphorus, fluorine, that promotes process of a remineralization. Most wide circulation was received 10 % a solution of a gluconate calcium, 1-3 % a solution of Remodent, received from natural material. Into structure of a dry preparation of Remodent enter: calcium (4,35 %), magnesium (0,15 %), potassium (0,2 %), sodium (16 %), chlorine (30 %), organic substances (44,5 %) and others. It is let out as a white powder, from which prepare 1-3 % solution.

**Technique of remineralizing therapy of a caries in a stage of a light spot.**

The surface of a tooth is carefully mechanically cleared from debris by a brush, tampons, and then processed by 0,5-1 % solution of a Hydrogenous peroxide and dried up by a flow of air. Then for a site of the changed enamel on 15-20 of mines put the cotton humidified with a remineralizing solution (tampon is changed by everyone 4-5 mines).

After everyone third application of remineralizing solution, the surface of a tooth is dried up and becomes covered by tampon, impregnated by 2-4 % solution of sodium fluoride. Instead of a solution of a sodium fluoride it is possible to use Ftorlak, which put on the carefully dried up surface of a tooth. After end of all
procedure it is not recommended to accept nutrition and to gargle a mouth during 2 hours. The course of a remineralization consists from 15-20 applications, which spend each day or in day.

The important component of treatment of the center of a demineralization is strict keeping of a correct care of an oral cavity, which purpose - to not admit of formation of tooth plaque on a place of the former center of a demineralization.

Brown and black carious spot characterize a stage of stabilization of process.

Clinical and experimental research have shown, that rem.therapy of them is not effective. In most cases it is shown of wiping off of the struck site and local application of agents having of remineralizing properties.

**The mechanism of action of a galvanization**

The galvanization is use of a continuous constant current of a low strain (30-80 w) and small force (up to 50 мкА) for the medical purposes. In tissues under action of a constant current there are changes, which result in formation of new conditions for course of various biochemical and physical processes.

Under action of a constant current in tissues of a body the vessels extend, circulation of blood accelerates and there is a hyperemia, the permeability of a vascular wall raises, local temperature raises. The excitement of nervous receptors in an operative range results in change of their excitability. Arising afferent impulsion in the CNS and vegetative centers causes of reflective reaction of local, segmental and generalized type, that results in change of functions of bodies. The secondary humoral action as result of a boring of endocrine system is marked. Therefore, action of a constant current basically depends from a locating of electrodes, and not just from parameters of influence and functional condition of an organism.

**Technique of electrophoresis and UVR - therapy**

By the most effective agent of a remineralization is electrophoresis of calcium, phosphorus and fluorine in a carious spot. To enter calcium, it is recommended in variety 5 % solution of gluconate calcium. The complex introduction of trace substances with remineralizing liquid by Borovskiy-Platonov
is recommended. Electrophoresis it is necessary to spend each day during 10-20 days. The efficiency of a remineralization can be estimated on decrease of pointing by methylene dark blue or measuring electrical resistance of a carious spot.

At a systemic lesion by caries process simultaneously with electrophoresis of minerals for improvement of metabolic processes it is rational to spend with general irradiation of UV-beams. At difficulties with a general irradiation of UV-beams it is possible to influence on a zone of collar or gingiva.

**Principles of general treatment of a caries in a stage of a chalky spot in patients with high caries intensity.**

The treatment consists in rising of a nonspecific resistance of an organism, stimulation of activity of sialadens and maintenance of the certain level of mineral substances and trace elements in tissues and surroundings.

The general treatment provides introduction in an organism of enough of proteins of an animal parentage (daily about 1,5 grams on 1 kg of weight of a body of the patient). It is important to limit entering in an organism of carbohydrates, at the expense of which is admitted to cover no more than 50 % of power expenses of an organism. It is necessary to provide by mineral substances, which best source is milk products.

At the acute forms of a caries it is necessary to enter preparations containing salts of calcium and phosphorus. After reception inside of Calcium glycerophosphate in a dose 0,5 g two times per day in a combination to vitamins B1 and B6 (these preparations should be entered within one month) the sharp decrease of quantity of teeth requiring sealing is marked. At a stage of decrease of a natural resistance of an organism there is a deficiency of some vitamins. The vitamins C and B6 concern first of all to their number. At treatment of the acute forms of a caries alongside with Acidum ascorbinicum (0,1 - 0,2 g per day) and pyridoxine (0,05 - 0,1 per day) pertinently to nominate Retinolum and ergocalciferolum, involved in adjustment of a phosphorus-calcium exchange and Thiaminum, which deficiency can result in decrease of resistance of teeth to caries. Recently in clinical practice has appeared a lot of effective anticarious complexes with vitamins and trace
Use of immunomodulating preparations for treatment of a caries of teeth is effective only at weak nonspecific resistance of an organism. At a good natural resistance the immunomodulating therapy has no appreciable influence on efficiency of treatment of a caries of teeth.

The decision about prescription of immunomodulating treatment is based on an estimation of a condition of a nonspecific resistance of an organism and change of its parameters. The experience proves, that at inspection of the patients with a caries will enough be limited by parameters of activity of a lysozyme of a saliva (mixed and parotid), and also bactericidal action of dermal integuments. Effectively and rationally to influence medicaments on regulation of a natural resistance of an organism. Hormonal preparations (Nerobolum, Nerabolilum, Retabolilum), salt of nuclein as acide, purine and pyrimidine derivative (Pentoxylum, Methyluracilum, and ets.) can be used. Nucleinate of a sodium in a dose 0,1g till 2 times per day. The course of treatment makes 20 days. Same on duration a course of treatment as introduction in an organism of orotat of potassium till 0,5g 3 times per day practically has no restrictions connected to contraindications. Pentoxylum in a dose 0,2g accept 3 times per day during 15 days. Listed and other preparations at a caries nominate as a course.

With this purpose of stimulators of CNS can used preparations of ginseng, Radix Ginseng (tinctura 1:10 on 15-25 drops 3 times a day); Tinctura Schizandrae (0,5 g or on 20-30 drops 2-3 times a day after eating), Extractum Eleuthero-cocci fluidum on 15-25 drops 3-4 times a day before eating, Extractum Leuzeae fluidum, The caries develops at deficiency of fluorine, which basic source is water. At the use of fluorine-scarce water the frequency of the acute forms of a caries of teeth grows. It is necessary to enter inside to adult 4-6 mg of fluorine daily. A course of treatment by fluorides not less than 12-18 months. The therapeutic action of fluorine is taped not earlier than in 12 months after beginning of treatment.
Useful component of general therapy of the acute forms of a caries can be an artificial ultra-violet irradiation, which is rational in regions with small quantity of solar days. In such cases spend 20 sessions of a body irradiation by a quartz lamp till 0,5 bio doses. An ultra-violet irradiation nominates in winter time. As the acute forms of a caries develop at weak people, it is necessary to mean an opportunity of hardening.

The quite good medical effect is rendered by a stimulation of function of sialadens. At children with the weakened natural resistance of an organism the viscosity of a saliva raises. Intensifying of a salivation promotes intensive biting of hard nutrition. The eating of acidic, spicy food also strengthens allocation of a saliva. With the purpose of intensifying a salivation the medicinal grasss (Rhizoma Inulae helenii, Herba Thermopsidis, Folium Farfarae) can be used. Mucolytic agents, also can be applied: Bromhexinum in tablets on 0,004 - 0,008 g till 2-3 times during 3-4 weeks. The indications for appointment of agents stimulating a salivation define through assays describing rate of a salivation and viscosity of a saliva.

6. Self-monitoring materials for topic № 14:

A. Tests with one correct answer
1. At morphological research of firm tooth tissues at acute initial caries the increase in microspaces between crystals of hydroxyappatite in enamel to 14 % (at norm of 3 %) is observed in:
   A) Intermediate zone of defect;
   B) Internal zone of defect;
   C) Under surface zone of defect;
   D) Superficial zone of defect;
   E) Central zone of defect.

2. At morphological research of firm tooth tissues at acute initial caries the increase in microspaces between crystals of hydroxyappatite in enamel to 20-25 % (at norm of 3 %) is observed in:
   A) Intermediate zone of defect;
   B) Internal zone of defect;
   C) Under surface zone of defect;
   D) Superficial zone of defect;
   E) Central zone of defect.
3. At morphological research of firm tooth tissues at acute initial caries the increase in microspaces between crystals of hydroxyapatite in enamel to 0.75-1.5 % (at norm of 3 %) is observed in:
   A) Intermediate zone of defect;
   B) Internal zone of defect;
   C) Under surface zone of defect;
   D) Superficial zone of defect;
   E) Central zone of defect.

4. As much as possible stable zone at acute initial caries is:
   A) Intermediate zone of defect;
   B) Internal zone of defect;
   C) Under surface zone of defect;
   D) Superficial zone of defect;
   E) Central zone of defect.

5. A method of drying of an investigated surface of tooth crown on E. V. Borovskiy, P. A. Leus is used for diagnostics:
   A) Superficial caries;
   B) Initial caries;
   C) Fluorosis;
   D) Acute middle caries;
   E) Enamel erosion.

6. The basic complaint of the patient at acute initial caries on:
   A) Spontaneous pain;
   B) Night pain with irradiation;
   C) Acute pain from stimulus;
   D) Sensation of a soreness of the mouth during the use sour;
   E) Aching pain from the cold.

7. During probing at chronic initial caries it is marked:
   A) Painlessness;
   B) Roughness of a surface of a stain;
   C) The probe is not late;
   D) The probe slides on a stain surface;
   E) All answers are true.

8. Percussion a tooth at chronic initial caries:
   A) It is sharply painful;
   B) It is sensitive;
   C) It is painless;
   D) The horizontal sensitive;
   E) The vertical sensitive.

9. Tooth thermodiagnostics at chronic initial caries:
   A) It is sharply painful;
   B) There is an aching pain;
   C) The pain from the cold ceases for 3 minutes;
   D) It is painless;
   E) There is a sharp pain.
10. For differential diagnostics of acute initial caries with not carious defeats spend:
   A) X-ray-diagnostic;
   B) The TER-test;
   C) Vital coloring;
   D) Thermodiagnostic;
   E) Test for preparation.

   **Self-monitoring materials for topic № 15:**

   **A. Tests with one correct answer**

   **1. Treatment of acute initial caries by a conservative method is based on:**
   A) Demineralization of enamel;
   B) Remineralization of enamel;
   C) Grinding of enamel;
   D) Supervision over a current for carious process without intervention;
   E) Carrying out of professional cleaning of a teeth.

   **2. Treatment of chronic initial caries that is diagnosed on frontal teeth is spent as:**
   A) Grinding of carborundum heads;
   B) Grinding and the subsequent processing of enamel surface of a remineralized means;
   C) Professional cleaning of a teeth;
   D) Remineralized therapy;
   E) Demineralized influence on enamel.

   **3. The technique of treatment of acute initial caries by G.M.Pahomov provides application:**
   A) 10 % lidocaine solution;
   B) 3 % solution of remodente;
   C) 3 % solution of peroxide of hydrogen;
   D) 10 % solution of calcium glyconate;
   E) 1-2 % a solution of fluoric sodium.

   **4. Technique of treatment of acute initial caries by E. V.Borovsky and P.A.Leus provides application:**
   A) 10 % lidocaine solution; 1-2 % solution of fluoric sodium.
   B) 1 % solution of peroxide of hydrogen; 1-2 % solution of fluoric sodium.
   C) 3 % solution of peroxide of hydrogen; 2 % solution of calcium glyconate;
   D) 10 % solution of calcium glyconate; 1-2 % solution of fluoric sodium.
   E) 2 % solution of calcium glyconate; 10 % solution of fluoric sodium.

   **5. For deep fluoridation of enamel at treatment of acute initial caries apply a technique:**
   A) E. V.Borovskiy;
   B) G.M.Pahomov;
   C) E. V.Borovskiy, P.A.Leus;
   D) A.Knappvost;
   E) V.K.Leontev.
6. The solution of magnesium-fluoric silicate and suspension of calcium hydroxide is used at treatment of acute initial caries by a technique:
A) E. V.Borovskiy;
B) G.M.Pahomov;
C) E. V.Borovskiy, P.A.Leus;
D) A.Knappvost;
E) V.K.Leontev.

7. For deep fluoridation of enamels and dentine apply:
A) Fluorine-containing a tooth-paste «Colgate»;
B) "Glufluorine";
C) Fluorine-varnish;
D) 3 % solution of remodente;
E) Fluorine-containing a tooth-paste «Colgate Sensitive Pro-Relief».

8. After the termination of application of 10 % solution of calcium glyconate on a surface with white chalc-shaped stain by technique E.V.Borovskogo, P.A.Leusa a session of remineralized theraphy finish:
A) Vital colouring;
B) Grinding of stain;
C) Covering of a surface of a stain for adhesive;
D) Application of 2-4 % by a solution of fluoride of sodium for 5 minutes;
E) Application of 4 % solution of remodente for 10 minutes.

9. For remineralized theraphy are used 3 % sol. of remodent, consistins of:
A) 4,35 % of calcium, 0,15 % of magnesium, 0,2 % of potassium, 16 % of sodium, 30 % of chlorine, 40,5 % of organic substances;
B) 43,5 % of calcium, 0,15 % of magnesium, 0,2 % of potassium, 16 % of sodium, 30 % of chlorine, 40,5 % of organic substances;
C) 4,35 % of calcium, 30 % of chlorine, 40,5 % of organic substances;
D) 43,5 % of calcium, 30 % of chlorine, 40,5 % of organic substances;
E) 50 % of calcium, 15 % of magnesium, 2 % of potassium, 16 % of sodium, 30 % of chlorine, 45 % of organic substances.

10. For prolongation action of fluorine on hard tooth tissues the fluoric varnish is used:
A) «Белагель F»;
B) «Fluor Protector»;
C) "Duraphat";
D) «Bifluorid 12»;
E) All answers are true.

B. Clinical tasks:
1. A 25-year-old patient complains of a light brown spot in the upper front tooth. Objectively: the 23 tooth has a single light brown spot in the precervical region. Probing reveals smooth surface. The tooth is nonresponsive to cold and probing. What is the most likely diagnosis?
   A. Local enamel hypoplasia
   B. Fluorosis
   C. Chronic initial caries
D. Acute initial caries
E. Chronic superficial caries

2. Parents of a 12-year-old child are concerned about the child having white spots on the frontal teeth of the upper jaw; the spots appeared half a year ago. Objectively: there are chalky spots detected in the cervical zone of the 11th, 12th, 13th, 21st, 22nd, 23rd teeth vestibular surface. The enamel in those spots is dull; probing revealed it to be pliant and coarse. The anamnesis states short-time pain caused by chemical stimuli. What is the provisional diagnosis?
   A. Systemic hypoplasia of enamel
   B. Acute superficial caries
   C. Dental fluorosis
   D. Acute initial caries
   E. Chronic initial caries

3. A 16 year old patient complained about discomfort in the area of her upper jaw teeth she has been feeling for 2 weeks. Examination of precervical area of the 11 and 12 teeth revealed whitish matt spots with indistinct outlines that absorb dyes intensively. What treatment of the 11 and 12 teeth should be administered?
   A. Preparation and filling
   B. Remineralizing therapy
   C. Spot removal
   D. Antiseptic treatment
   E. Silver impregnation

4. After removal of dental plaque an 18-year-old patient underwent preventive examination. It revealed painless chalky spots in the precervical region on the vestibular surface of the 22 and 41 teeth. Result of enamel resistance test is 7. What morphological changes are typical for this disease?
   A. Subsurface enamel demineralization
   B. Changes in the mantle dentine
   C. Damage of dentinoenamel junction
   D. Superficial enamel demineralization
   E. Degenerative changes of odontoblasts

5. An 18-year-old man complains of the 14, 13, 12, 23, 24 teeth being sensitive to sweet and sour food. Examination revealed some isolated ill-defined chalky spots in the precervical region. What is the most informative method of study that allows to confirm the diagnosis?
   A. Vital staining
   B. X-ray
   C. Probing
   D. Electro-odontometry
   E. Thermometry

6. A 19-year-old young man complains of cosmetic defect of all his teeth, which developed immediately after the teeth eruption. Objectively on the vestibular and masticatory surfaces of all patient’s teeth there are enamel defects, tooth crowns present with dark brown discoloration. Percussion and probing are
painful. In this area fluoride levels in water are 2.6 mg/L. Make the provisional diagnosis:
A. Fluorosis  
B. Systemic hypoplasia  
C. Chronic initial caries  
D. Enamel erosion  
E. Chronic superficial caries  
7. On examination of a 27-year-old patient the tip of the dental probe caught on the fissures of the 36, 37, and 38 teeth. Margins of the enamel defect are dark, the surface is coarse. Teeth transillumination with photopolymer lamp revealed the defect to be limited to the enamel. What is the most likely diagnosis?  
A. Chronic superficial caries  
B. Chronic median caries  
C. Acute superficial caries  
D. Chronic initial caries  
E. Acute initial caries  
8. A 37-year-old woman came to the dentist with complaints of brief attacks of toothache caused by eating sweets. Objectively there is a shallow carious cavity within enamel. On probing cavity walls and bottom are coarse; there is no response to thermal stimuli. Make the diagnosis:  
A. Acute median caries  
B. Endemic fluorosis  
C. Enamel hypoplasia  
D. Acute superficial caries  
E. Chronic median caries  
9. A 24-year-old patient came to the dentist complaining of chalky lesions on the front teeth. Objectively teeth 13, 12, 11, 21, 22, and 23 present with chalky lesions separated by areas of healthy unchanged enamel. Lesion surface is coarse; there is no response to thermal stimuli. Childhood years of the patient were spent in the area with fluorine level of 1.8 mg/L in drinking water. Make the diagnosis:  
A. Enamel hyperplasia  
B. Endemic fluorosis  
C. Enamel hypoplasia  
D. Acute superficial caries  
E. Chronic superficial caries  
10. A 34-year-old male patient complains of a cosmetic defect, a cavity on the vestibular surface in the cervical part of the 21 tooth. Objectively: the carious cavity is within the enamel, the floor and the walls are pigmented, probing and percussion and painless. There is no pain reaction to stimuli. What is the most likely diagnosis?  
A. Chronic surface caries  
B. Chronic median caries  
C. Acute median caries  
D. Necrosis of dental hard tissues  
E. Acute surface caries
11. A 23-year-old patient complains of whitish spots on the masticatory teeth, drawing of mouth during taking acidic food. The spots appeared about 3 months ago. Objectively: the cervical region of the 46, 36, 27 teeth exhibits some chalk-like spots that can be easily stained with 2% methylene blue, probing reveals the surface roughness. What is the most likely diagnosis?

A. Acute superficial caries  
B. Acute initial caries  
C. Enamel hypoplasia  
D. Endemic fluorosis  
E. Chronic superficial caries

12. An 18-year-old patient complains of chalky spot in the 23rd tooth, which is slightly painful when cold stimulus is applied. Objectively: the vestibular surface near dental cervix of the 23rd tooth has a white spot 2-3 mm in size. Probing is painless and reveals coarseness of the surface. Thermal stimulus causes slightly painful feeling. What is the most probable diagnosis?

A. Fluorosis  
B. Enamel necrosis  
C. Local hypoplasia  
D. Chronic initial caries  
E. Acute initial caries

7. Recommended literature

**Base:**
9. Lecture material on discipline “Therapeutic Stomatology”.

**Additional:**


**Information resources on the Internet:**
- http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the the candidate of medical sciences, docent Marchenko Irina Jaroslavovna
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

<table>
<thead>
<tr>
<th>Educational discipline</th>
<th>Therapeutic Stomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1:</td>
<td>Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td>Content module № 2</td>
<td>“Caries and not carious defeats of teeth”</td>
</tr>
<tr>
<td><strong>Topic 16</strong></td>
<td><strong>Acute and chronic superficial and middle caries:</strong> pathomorphology, clinic, diagnostics, differential diagnostics. Sequence and features of treatment stage.</td>
</tr>
<tr>
<td><strong>Course</strong></td>
<td>III</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td>Stomatological</td>
</tr>
</tbody>
</table>
1. **Relevance of the topic:** The topic basis: the caries of teeth is the most wide-spread disease among the population of all age groups. The complications caused by a caries, result in appreciable infringement of chewing efficiency, that is shown subsequently by various pathology of a gastrointestinal path and infringement of many kinds of a metabolism. The cosmetic defects at carious defeats often are the reason of many moral torments and psychoemotional traumas of the patients. It is logical, that the knowledge of displays of a caries at its different stages is necessary for the future doctors-stomatologists for successful diagnostics, effective treatment and reliable prophylaxis of most mass stomatological disease.

2. **Specific goals:**

   Get to know the clinical manifestations and principles of diagnostics an acute and chronic superficial and middle caries

   To know:

   1. Pathomorphological changes at the acute and chronic superficial and middle caries;
   2. Clinic of an acute and chronic superficial caries;
   3. Clinic of an acute and chronic middle caries;
   4. Main differential signs of the acute and chronic superficial and middle caries.

   To be able:

   1. To diagnose the various forms of the acute and chronic superficial and middle caries on the basis of the given subjective and objective methods of inspection;
   2. To spend differential diagnostics of the acute and chronic superficial and middle caries with other forms of a caries, not carious defeats.

3. **Basic knowledge, experience, skills necessary for studying the topic**

   *(interdisciplinary integration)*

<table>
<thead>
<tr>
<th>Previous disciplines</th>
<th>Skills</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Anatomy</td>
<td>Anatomical structure: enamel, dentine, pulp, cement, periodontium ligament, tooth pulp.</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Histology</td>
<td>features of a histological structure of tooth enamel, dentine, cement, pulp, periodontium ligament.</td>
</tr>
<tr>
<td>Pathological anatomy</td>
<td>pathological changes at an acute and chronic caries of various depth of a defeat.</td>
</tr>
<tr>
<td>Microbiology</td>
<td>Properties of the microflora of the oral cavity, cariesogenicity factors.</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>the mechanism of action of substances of cariesogenic action and substances having remineralizing action.</td>
</tr>
<tr>
<td>Therapeutic stomatology</td>
<td>To know equipment of a workplace of the student - stomatologist. Ethics and deontology of stomatological reception; To be able to prepare a workplace of stomatological reception to use ethical and deontological principles of job, give a first aid to the patient.</td>
</tr>
</tbody>
</table>

4. Tasks for independent work during preparation for employment and at the lesson

4.1. List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>The superficial caries</td>
<td>is a pathological process which is characterized by demineralization of all layer of enamel with formation of defect in the form of a cavity within enamel.</td>
</tr>
<tr>
<td>The middle caries</td>
<td>is a pathological process which is characterized by demineralization of enamel and a cloak layer of a dentine (mantle dentine) with formation of defect within a mantle dentine in the form of a cavity.</td>
</tr>
<tr>
<td>The transparent dentine</td>
<td>The (region hypermineralizations) - a layer of the compacted dentine with considerably reduced dentinal canalicules</td>
</tr>
<tr>
<td>Replaceable (tertiary) dentine</td>
<td>layer of dentine, which form at arch of pulp chamber in projective of carious lesion</td>
</tr>
</tbody>
</table>

4.2. Theoretical questions to the lesson:

1. Pathomorphology of the acute and chronic superficial caries;
2. Pathomorphology of the acute and chronic middle caries;
3. Clinic of acute the acute superficial caries;
4. Clinic of the chronic superficial caries;
5. Clinic of the acute middle caries;
6. Clinic of the chronic middle caries;
7. Differential diagnostic of acute and chronic superficial caries;
8. Differential diagnostic of acute and chronic middle caries;
9. Differential diagnostic acute superficial caries and chalked-dotty form of fluorosis;
10. Differential diagnostic chronic superficial caries and erosive (destructive) form of fluorosis;
11. Differential diagnostic chronic middle caries and wedge-shaped defect;

4.3. **Practical work (tasks), which are performed at the lesson:**
1. Perform a subjective examination of a dental patient with superficial and middle caries: to clarify complaints, to collect anamnesis of illness and life.
2. Perform a objective examination of a dental patient with superficial and middle caries: survey, probing, percussion, palpation.
3. Perform the additional diagnostic method.
4. To diagnose the various forms of superficial and middle caries on the basis of the given subjective and objective methods of inspection;
5. To spend differential diagnostics of the acute and chronic superficial and middle caries with other forms of a caries, not carious defeats.
6. Carry out stage by stage treatment of superficial and middle caries.

5. **The contents of the topic:**

**The pathological changes, which occur at an acute superficial caries.**

After occurrence of the center of a demineralization, which clinically is characterized by presence of a white carious spot, in the further process can develop by two ways. In one case (acute course of process) under condition of further progressing of process of a demineralization, superficial layer, which due to some factors long time was remained a very little changed blasts and there is a
defect in the limits of enamel of a tooth. It is necessary to emphasize, that thus in deep layers of enamel the morphological changes can be absent.

In a stage of an acute superficial caries in center there is a defect, covered by the broken prisms. This zone on periphery is painted more intensively and without precise borders merges with normal enamel. Near to the given features of enamel there are changes which have received the name " of spongiform enamel ". This is the original frame of enamel, which is near dentin-enamel junction and reminds sponge. A prisms of enamel in this place look like struck with corrosion or vacuolized, often are absent. The interprismal substance swells also looks like extended fibers.

**The pathomorphologic changes at a chronic superficial caries.**

After occurrence of defect within the limits of enamel of a tooth, the process can proceed more long time. Thus at the polarizable-microscopic diagnostic the changes, fascinating all thikness of enamel are taped: the zones, characteristic for the center of a carious defeat (body of a defeat, dark and transparent zones) are well visible.

At a superficial chronic caries there is a site of a destruction of enamel with presence of microorganisms, but the dentin-enamel junction is not broken and in a dentine the changes at first are absent.

During further progressing of a demineralization there is a destruction of dentin-enamel junction and there is a stage of an middle caries.

**Pathomorphology of an acute middle caries.**

At this stage of disease the pathological process covers not only enamel, but also blasts dentin-enamel junction, and also is distributed in limits of a cloak dentine. As the professor I.G.Lukomskiy emphasized, the caries of a dentine differs from the superficial forms of a caries by features, which depend on connection of the microbic factor, due to what it gets features of infectious process. This is promoted by anatomic features of a dentine: presence of dentinal canalicules and much greater, in comparison with enamel, contents of organic substances.

At a caries of a dentine the enamel in the center of a defeat completely is absent, on walls of a cavity is in different stages of destruction.

In a dentine there are defects circumscribed to a zone of a carious dentine. In last, as well as at a caries of enamel the same basic layers are defined: a layer of disintegration, layer of hypocalcination, the degree of which expressiveness is various depending on course of process. The carious center, that covers enamel, dentine, has the form of a triangle, top directed to a pulp. At acute current of process height of a triangle considerably prevails above the basis. At an acute caries the process is distributed along dentin-enamel junction, in this connection the undermined edges of enamel are formed then the cavity has the form of a rhombus, which short diagonal settles down on dentin-enamel junction.

Microscopically the caries of a dentine is characterized by the following: the most peripheric sites of a dentine absolutely non-structural, light colour, consist of an amorphous dentine separate fragments of a dentine, which have saved up a structure of a dentine, extraneous bodies and clump of microorganisms. In a
direction of a pulp such layer of a destruction passes in a zone, where there are outlines of frame of a dentine (zone of a demineralization), as the chemical researches fix here deficiency of calcareous salts.

Dentinal canalicles in this zone are extended compared with normal.

**Pathomorphology of a chronic middle caries.**

In this stage of a caries in a light microscope three zones are defined:

a) of disintegration and demineralization;

b) of a transparent dentine;

c) intact dentine;

d) replaceable (tertiary, substitute) dentine and changes in a pulp.

In the first zone the rests of destructions of enamel and dentine with a plenty of microorganisms are visible. Frame of a softened dentine more deeply differs, dentinal tubules are extended also here and there merge with microcavities (caverns) filled by bacteria. In deep layers of a dentine the quantity of microorganisms decreases. The dentinal processes of odontoblasts are exposed to a fatty dystrophia. It is necessary to note, that the softening and destruction of a dentine occurs more intensively along dentin-enamel junction, but at the chronic form of a middle caries the hanging edges of enamel already are absent: they break off at a mastication. In other zone there is a layer of a transparent dentine and intact dentine. On a measure of progressing of carious process a layer of an intact dentine above a pulp becomes more thin. The demineralization of a dentine is accompanied by destruction of dentinal processes of odontoblasts (fiber by Toms), on which place the microorganisms accumulate, there is a dissolution of organic substance (in the basic collagen) of a demineralized dentine.

On periphery of a carious cavity in a direction to a pulp dentinal canalicles extend and are deformed. The layer of the condensed transparent dentine (zone of hypermineralization) with considerably narrowed dentinal canalicles, which gradually pass in a layer of the not changed (intact) dentine, which is posed above a pulp of a tooth, is more deeply posed.

In the third zone (zone of the changed pulp) accordingly of center of a carious defeat the layer of a vicarious dentine is formed which differs by less focused locating of dentinal canalicles.

**At the acute middle caries** following zones are allocated:

1. Decay and demineralization enamel and cloak dentine;

2. Intact nearpulpul dentine;

3. Changes in a pulp.

At an acute caries the process is distributed along dentin-enamel junction, in this connection the undermined (hanging) edges of enamel are formed. The cavity has the form of a rhombus, which short diagonal settles down on dentin-enamel junction. Transparent and replaceable dentine has not time to be developed, therefore process quickly passes on nearpulpul dentine.

**Clinic of acute superficial caries**

- **Complaints:** short-time pain from chemical (acidic, sweet, bitter) and less often from temperature irritant. It is more often observed at localization of defect in the field of nick of teeth, where sides are the thinnest.
Anamnesis of diseases: causal tooth earlier it is not treated, complaints have occurred 1 month ago.

Objective examination of a disease place:
- At survey – on the centre of whitish maculae defect of enamel is defined.
- At probing the rough surface of enamel and painfulness are defined.
- A vertical and horizontal percussion and palpation a mucosa in range of apexes projection of tooth root are painless.
- At thermo diagnostic: inappreciable short-time painful sensitivity. EOD: 2-6 mkA.

Clinic of chronic superficial caries
Difference:
- Absence of painful sensitivity.
- Long current.
- Colouring of defect of enamel       in dark colour

Clinic of acute middle caries
- Complaints: short-time pain from chemical and temperature irritant, hit and hold back of food;
- Anamnesis of diseases: causal tooth earlier was not treated, complaints have occurred 2-3 month ago.

Objective examination:
- At survey – caries cavity settles down in limits of cloak dentine, with narrow entrance aperture. The defect of enamel is insignificant, does not correspond to the sizes of a cavity in a dentine. The edges of defect in enamel sometimes are transparent, fragile (easily break off by an excavator). A dentine of bottom and walls are light and softened at probing.
- At probing painfulness at enamel-dentin border are defined.
- A vertical and horizontal percussion and palpation a mucosa in range of apexes projection of tooth root are painless.
- At thermo diagnostic: inappreciable short-time painful sensitivity. EOD: 2 -12 mkA.

Clinic of chronic middle caries
- Complaints: pain is absence; patients complain at presence of a carious cavity, hit and hold back of nutrition.
- The disease anamnesis: tooth earlier was not treated, complaints have occurred about 6 months ago.
- At survey of tooth the middle depth caries cavity with a wide inlet opening is defined. A dentine of bottom and walls is dark, dense at probing.
- A vertical and horizontal percussion and palpation of a mucosa in the field of apex projection of tooth root are painless.
- Response to probing and a thermodiagnostic are painless.
- EOD - 2-6 мкА.
- The test for preparation: at diagnostic preparing on a dentine-enamel border without previous anesthesia pain arises.

Differential diagnostics of a superficial caries.
The superficial caries is necessary for differentiate from a hypoplasia, erosion of hard tissues and clinoid defect.

At a hypoplasia a surface of enamel is smooth, not softened, the defects are localized at different levels of symmetric teeth, instead of on characteristic for a caries surfaces of crowns of teeth.

The erosion of hard tissues of teeth has the saucer-shaped form, its bottom is smooth, brilliant. The erosion often is accompanied by a hyperesthesia - hypersensibility to mechanical, chemical and temperature irritants. In an anamnesis the often use of juices, fruit and acidic nutrition quite often is taped.

The clinoid defect is localized extremely at the neck of teeth, has dense walls and characteristic wedge form of defect. Usually proceeds asymptotically.

**Differential diagnostics of an acute middle caries.**

This stage of a caries is necessary for differentiating with: a fluorosis (destructive form), erosion of enamel, clinoid defect, superficial acute caries, acute deep caries, middle chronic caries.

At a fluorosis on enamel is multiple and white, and brown spot which is not having of precise borders, posed on different surfaces of all groups of teeth. For a fluorosis the endemicity of a defeat is inherent - it is shown in all or at the majority of the inhabitants any of region.

The clinoid defect is localized extremely near the neck of a tooth, it has hard walls and characteristic form of a wedge with smooth, as though the polished walls.

The superficial acute caries is within the limits of enamel, not going deep further of dentin-enamel junction.

At a deep caries the center of a defeat is immersed not only in limits of cloak, but also nearpulpal dentine, probing of bottom of a carious cavity and dentin-enamel junction is morbid, the reaction on chemical, temperature irritants is sharply morbid, it quickly disappears at elimination of action of irritant. EOD at an acute deep caries causes a pain reaction at 10-15 мкA.

**Differential diagnostics of a chronic middle caries.**

It is necessary to differentiate with clinoid defect, erosion, deep acute and deep chronic caries.

The similarity of a chronic middle caries with chronic periodontitis consists in absence of pain sensations at presence of a carious cavity. The difference of these diseases is, that at the preparation of a cavity at a caries, there is a pain, and at the periodontitis the reaction on the preparation is absent, as a pulp is dead. In this connection the reaction on external irritants is various also: at an middle chronic caries the tooth reacts to a current 2-6 мкA, at the periodontitis - on a current by force more than 100 мкA. On a roentgenogram at a caries a tissue of a periodontium is not changed, and at chronic periodontitis there is a resorption or destruction of an bone tissue in apical area.
OPERATIVE TREATMENT OF CARIES

provides to remove pathologically changed hard tissues of a tooth with their subsequent replacement by filling material.

Treatment stages

1. Anesthesia (regime of preparation)
2. Mouth preparation (isolation of work place, removal of a tooth plaque, if necessary – treatment of an inflammation of a gum, parodontitis)
3. Preparation of caries cavity
   Preparation (techniques: 1) classical;
   2) preparation sub composites;
   3) M.I. - therapy (bate-cave, tunnel preparation «preventive sealing»);
4. Washing and medical processing of caries cavities.
   It is not recommended to process spirit or an aether which reduce adhesion of composite materials (spirit destroys a matrix of composites BIS-Gma).
   You can use 2% sol. chloramini, 1: 2000 sol. furacyllini, 1-2% sol hypochloridi Na. But it is opinion that Hydrogen peroxide is absorbed in dentine and reduce the polymerisation of adhesive systems. The last recommendations - to wash out by warm water and to dry up by air.
5. Putting of an isolating lining. Purpose of putting:
   - To provide protection of a pulp against chemical, thermal and galvanic influences;
   - To distribute of chewing loading;
   - To improve fixing constant filling material;
   - It is desirable to possess anticaries action.
6. Filling caries cavity by constant material.
7. Polishing of filling.

7. Self-monitoring materials:
   A. Tests with one correct answer
   1. For different caries form are characterized such character of a pain:
   A) Spontaneous, attack-shaped;
   B) Proceeds after elimination of stimulant;
   C) Arises under action of stimulant;
   D) Arises under action of stimulant and some time after its elimination proceeds;
   E) Arises at biting, touch to a tooth.
   2. The short-term pain from thermal stimulants which quickly disappears after the termination of their action, is characteristic for:
   A) Acute superficial caries;
   B) Chronic superficial caries;
   C) Chronic middle caries;
   D) Acute serous periodontitis;
   E) Caries of devital tooth.
3. Carious cavity at initial caries is localized on a contact surface of a tooth. In that case the patient can disturb:
   A) Mobility of a tooth;
   B) Pain at biting on a tooth;
   C) Pain during tooth cleaning;
   D) Food delay between a teeth;
   E) Irradiation pain.
4. Complaints of the patient at chronic superficial caries:
   A) On sensation of a soreness of the mouth during the use of sour food;
   B) On cosmetic defect of a tooth;
   C) On a pain at biting on a tooth;
   D) On a pain from thermal stimulants;
   E) Nightly spontaneous pain.
5. EOD at chronic superficial caries in limits:
   A) 2-6 mkA;
   B) 6-10 mkA;
   C) 20-25 mkA;
   D) 30-40 mkA;
   E) 50-70 mkA.
6. Percussion of a tooth at chronic middle caries:
   A) It is sharply painful;
   B) It is sensitive;
   C) It is painless;
   D) The horizontal painful;
   E) The vertical painful.
7. Tooth thermodiagnostic at acute middle caries:
   A) It is sharply painful;
   B) There is an aching long-time pain;
   C) The pain from the cold ceases for 3 minutes;
   D) Painful, but quickly disappears after elimination of stimulant;
   E) There is a acute long-time pain.
8. Morphological changes which are observed in hard tooth tissues at chronic superficial caries can be characterized:
   A) Changes in a tooth pulp;
   B) Changes in a periodontium;
   C) Destruction of enamel without infringement dentine/enamel connections;
   D) Destruction of enamel and coat dentine;
   E) Focusis demineralized of enamel.
9. Zones transparent and replaceable dentine are absent at:
   A) Acute middle caries;
   B) Chronic deep caries;
   C) Chronic fibrous pulps;
   D) Chronic middle caries;
   E) Enamel erosion.
10. At middle caries defect is localized in limits:
A) Superficial layer of enamel;  
B) Enamels, not reaching to dentine-enamel border;  
C) Enamels with transition through dentine-enamel border;  
D) Mantle dentine;  
E) Near pulpal dentine.

B. Clinical tasks:

1. The patient H. appeals to stomatology with complaints at insignificant, short-time pain in a maxilla tooth on the right from thermal and chemical irritants. From anamnesis was found out that causal tooth earlier was not treated, complaints have occurred 2 month ago. Objectively: in second molar on a masticatory surface is the carious cavity within the limits of cloak dentine, with the overhanging edges of enamel. Dentine of a bottom and walls is softened, weak pigmented. Probing in aria of dentin-enamel border causes pain. Vertical and horizontal percussion and palpation in aria of root apex's projection are painless. Thermodiagnostic is sickly painful. EOD - 8 мкА. Put diagnose.
   A. Chronic deep caries 17  
   B. Acute deep caries 27  
   C. Acute middle caries 27  
   D. Acute middle caries 17  
   E. Chronic middle caries 17

2. A 35-year-old man complains of short-term pain caused by thermal stimuli in the 46 and 47 teeth. Objectively: masticatory surfaces of the 46, 47 teeth are intact, approximal surfaces could not be examined because of a very close arrangement of teeth. What methods of study can be used in this case if you suspect the presence of hidden cavities?  
   A. Vital staining  
   B. X-ray  
   C. Fluorescent study  
   D. Measuring electrical resistance  
   E. Electro-odontometry

3. A female patient complains about pain in the 11 tooth caused by sour and sweet food. Objectively: enamel changes in form of chalky appearance, a defect with light bottom within dentin-enamel junction on the vestibular surface in the precervical area of the 11 tooth. Probing was painless, percussion and cold stimulus caused no pain. What is the most likely diagnosis?  
   A. Acute initial caries  
   B. Acute superficial caries  
   C. Acute middle caries  
   D. Enamel hypoplasia  
   E. Fluorosis

4. Preventive examination of a 45-year-old patient revealed a carious cavity in the 23 tooth located within the mantle dentin. The cavity floor and walls are of dense, markedly pigmented dentin, probing and cold test provoke no pain,
percussion of the 23 tooth is painless. Electroodontometry results - 6 mA. What is the most likely diagnosis?

A. Chronic deep caries
B. Acute middle caries
C. Chronic middle caries
D. Acute deep caries
E. Chronic periodontitis

5. A 30-year-old patient complains about pain in the upper jaw tooth caused by sweet and cold food, that was first registered one month ago. Objectively: the 26 tooth has a carious cavity within mantle dentine. Dentine of its walls is softened. Probing along the enamel-dentine junction is painful. Percussion is painless. Thermodiagnosis causes pain, that quickly stops after elimination of stimulus. What is the most likely diagnosis?

A. Acute initial caries
B. Acute middle caries
C. Pulp hyperaemia
D. Acute deep caries
E. Chronic fibrous pulpitis

6. A 36-year-old female patient complains about an aesthetic defect of upper frontal teeth. In past history: she undergoes regular check-up in the endocrinological department on account of thyrotoxicosis. Enamel defects appeared several years ago and since that have been gradually expanding. Examination revealed that the 12, 11, 21, 22 teeth had transverse oval enamel defects on the vestibular surfaces. Probing and cold test is painless. Floor of the defects is smooth, glossy and hard. What is the most likely diagnosis?

A. Acute superficial caries
B. Erosion of hard tissues
C. Wedge-shaped defects
D. Systemic hypoplasia
E. Necrosis of hard tissues

7. A 17 year old girl applied to a dental clinic and complained about hard tissue defects on her frontal and lateral teeth. Subjectively these defects don't cause any inconvenience. Crown defects appeared long ago. The patient was born and has been living in an area where fluorine concentration in the drinking water makes up 1,2 mg/l. Objectively: on the vestibular surfaces of incisors on both upper and lower jaws in the equator area there are hard tissue defects within deep layers of enamel. The defects are parallel to the cutting edge. The same defects were revealed in the area of tubera of the first molars, floor and walls of the defects are smooth. Enamel of the defect floor is light-brown. What is the most probable diagnosis?

A. Local hypoplasia
B. Systemic hypoplasia
C. Focal odontodysplasia
D. Endemic fluorosis
E. Erosion of hard tissues of tooth
8. A 25-year-old female patient consulted a dentist about acute pain in the upper jaw on the left. The pain occurs during eating. Objectively: on the distal approximal surface of the 26 tooth there is a cavity filled with light soft dentin. Probing causes a slight pain along the dentin-enamel junction, percussion is painless. Cold water causes quickly abating pain. What is the most likely diagnosis?
   A. Chronic fibrous pulpitis
   B. Acute median caries
   C. Chronic median caries
   D. Acute deep caries
   E. Chronic deep caries

9. A 35-year-old patient has made an appointment with a doctor to have oral cavity sanitation. Objectively: the vestibular surface of the 22nd tooth has a hard tissue defect localised in the mantle dentin; the dentin is hard, dark-coloured, the floor of the cavity is coarse. Cold stimulus and probing are painless. What is the most probable diagnosis?
   A. Dental fluorosis, destructive form
   B. Chronic median caries
   C. Cuneiform defect
   D. Enamel erosion
   E. Hard tissue necrosis

10. An 11-year-old boy complains of a carious cavity in the mandibular tooth on the right. Objectively: the 46 tooth exhibits a carious cavity within the mantle dentin. The dentin is dense, pigmented; there is pain response to the cold stimulus; probing and percussion cause no pain response. Make the provisional diagnosis:
    A. Acute deep caries
    B. Chronic median caries
    C. Acute median caries
    D. Chronic superficial caries
    E. Chronic deep caries

11. A 13-year-old child complains of having a cavity in the front maxillary teeth. Contact medial surfaces of the 11 and 21 teeth exhibit cavities found within the mantle dentin and filled with dense pigmented dentin. Probing of the cavity floor causes no pain response, neither does dental percussion. Select the best filling material for the permanent seals:
    A. Glass ionomer cement
    B. Resin composite
    C. Silicate cement
    D. Silicophosphate cement
    E. Zinc phosphate cement

12. A 15-year-old girl complains of brief pain attacks in her teeth due to chemical stimuli. Objectively: on the contact surfaces of the 11, 21, 22 teeth there are enamel areas matt white in color, with lost shine, covered in large amount of dental deposit. Enamel is softened and can be easily chipped off with excavator. Probing of lesions is painless. Percussion is painless. No reaction to cold stimuli.
Make the diagnosis:
A. Acute superficial caries
B. Chronic superficial caries
C. Chronic initial caries
D. Acute initial caries
E. Acute median caries

7. Recommended literature

**Base:**
9. Lecture material on discipline “Therapeutic Stomatology”.

**Additional:**

Information resources on the Internet:
  - http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
  - http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the the candidate of medical sciences, docent Marchenko Irina Jaroslavovna
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

<table>
<thead>
<tr>
<th>Educational discipline</th>
<th>Therapeutic Stomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1:</td>
<td>Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td>Content module № 2</td>
<td>“Caries and not carious defeats of teeth”</td>
</tr>
<tr>
<td>Course</td>
<td>III</td>
</tr>
<tr>
<td>Faculty</td>
<td>Stomatological</td>
</tr>
</tbody>
</table>
1. **Relevance of the topic:** The topic basis: the caries of teeth is the most wide-spread disease among the population of all age groups. The complications caused by a caries, result in appreciable infringement of chewing efficiency, that is shown subsequently by various pathology of a gastrointestinal path and infringement of many kinds of a metabolism. The cosmetic defects at carious defeats often are the reason of many moral torments and psychoemotional traumas of the patients. It is logical, that the knowledge of displays of a caries at its different stages is necessary for the future doctors-stomatologists for successful diagnostics, effective treatment and reliable prophylaxis of most mass stomatological disease.

2. **Specific goals:**

   Get to know the clinical manifestations and principles of diagnostics an acute and chronic deep caries, features of its treatment.

   To know:
   1. Pathomorphological changes at the acute and chronic deep caries;
   2. Clinic of an acute and chronic deep caries;
   3. Main differential signs of the acute and chronic deep caries.

   To be able:
   1. To diagnose the various forms of the acute and chronic deep caries on the basis of the given subjective and objective methods of inspection;
   2. To spend differential diagnostics of the acute and chronic deep caries with other forms of a caries, not carious defeats.
   3. Perform one-visiting and two-visiting treatment of acute deep caries with differentiated choice of medical linings.

4. **Basic knowledge, experience, skills necessary for studying the topic**

   **(interdisciplinary integration)**

<table>
<thead>
<tr>
<th>Previous disciplines</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>Anatomical structure: enamel, dentine, pulp, cement, periodontium ligament, tooth pulp.</td>
</tr>
</tbody>
</table>
Histology | features of a histological structure of tooth enamel, dentine, cement, pulp, periodontium ligament.
---|---
Pathological anatomy | pathological changes at an acute and chronic caries of various depth of a defeat.
Microbiology | Properties of the microflora of the oral cavity, cariesogenesis factors.
Pharmacology | the mechanism of action of substances of cariesogenic action and substances having remineralizing action.
Therapeutic stomatology | To know equipment of a workplace of the student - stomatologist. Ethics and deontology of stomatological reception; To be able to prepare a workplace of stomatological reception to use ethical and deontological principles of job, give a first aid to the patient.

### 5. Tasks for independent work during preparation for employment and at the lesson

#### 5.1. List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>The deep caries</td>
<td>is a pathological process which is characterized by demineralization of all layer of enamel and dentine with formation of defect in the form of a cavity within circumpulpal dentine.</td>
</tr>
<tr>
<td>Treatment lining (subbase materials)</td>
<td>have therapeutic effect on the pulp due to an antiseptic properties and anti-inflammatory effect, they stimulate odontoblasts to produce mineralized dentine (so called substitution or tertiary dentine).</td>
</tr>
</tbody>
</table>

#### 5.2. Theoretical questions to the lesson:

1. Pathomorphology of acute deep caries;
2. Pathomorphology of chronic deep caries;
3. Clinic of acute deep caries;
4. Clinic of chronic deep caries;
5. Differential diagnostic of acute and chronic deep caries;
6. Differential diagnostic of acute deep caries with acute middle caries;
7. Differential diagnostic chronic deep caries and wedge-shaped defect;
10. Features of treatment acute deep caries.
11. Purpose of using the treatment lining in dentistry.
15. Mechanism of action Eugenol containing medical lining.
17. Differentiated choice of medical linings for one-visiting and two-visiting treatment of acute deep caries.

5.3. Practical work (tasks), which are performed at the lesson:
1. Perform a subjective examination of a dental patient with acute and chronic deep caries: to clarify complaints, to collect anamnesis of illness and life.
2. Perform a objective examination of a dental patient with acute and chronic deep caries: survey, probing, percussion, palpation.
3. Perform the additional diagnostic method.
4. To diagnose the various forms of acute and chronic deep caries on the basis of the given subjective and objective methods of inspection;
5. To spend differential diagnostics of the acute and chronic deep caries with other forms of a caries, not carious defeats.
6. Carry out stage by stage treatment of chronic deep caries.
7. Choose the treatment lining for one-visiting and two-visiting treatment of acute deep caries.
8. Perform stage by stage treatment of acute deep caries in one visiting.
9. Perform stage by stage treatment of acute deep caries in two visiting.
6. The contents of the topic:
Pathomorphology of an acute deep caries.

At an acute deep caries the enamel in the center of a defeat completely is absent, and on walls of a cavity is in different degrees of destruction. In a dentine there is more - less wide-spread defect circumscribed dentine. Carious center, which covers enamel and dentine, has the form of a triangle, top directed to a pulp. At acute current of process height of a triangle considerably prevails above the basis.

At an acute caries the process is distributed along dentin-enamel junction, in this connection the hanging edges of enamel are formed then the cavity gets the form of a rhombus, which short diagonal settles down on dentin-enamel junction. At an acute deep caries, when the center of a defeat is localized in a nearpulpal dentine, through a light microscope three zones are taped:

   a) Disintegration and demineralization;
   b) The thin zone of an intact dentine (sometimes is absent);
   c) Changes in a pulp.

But their parities are various, in comparison with a chronic deep caries.

At chronic caries a zone of transparent and substitution dentin are formed, which greatly protects the pulp from from the action of the irritants and slows the progression of the pathological process.

In the first zone the rests of decayed enamel and dentine with a plenty of microorganisms are visible. Frame of a softened dentine more deeply differs, dentinal canalicules are extended also here there merge with microcavities (caverns) filled by bacteria. In deep layers of a dentine the quantity of microorganisms decreases. The dentinal processes of odontoblasts are subject to a fatty dystrophia.

The demineralization of a dentine is accompanied by destruction of dentinal processes of odontoblasts (fiber by Toms), on which place the microorganisms accumulate. In turn under action of enzymes allocated by microorganisms, there is a dissolution of organic substance (in the basic collagen) of a demineralized
dentine. On periphery of a carious cavity in a direction to a pulp of a tooth dentinal canaliculus are extend and deformed.

Layer of the condensed transparent dentine (zone of hypermineralization) with considerably changed dentinal canalicules, which gradually pass in a layer of the not changed dentine, that is above a pulp, settles down more deeply.

In the third zone take place: quantity reduction of odontoblasts, their disorientation and fatty dystrophic. At a light microscopy at a deep caries the changes in vessels of a pulp externally similar to the basic inflammation are defined. The degenerative changes in some nervous fibers of a pulp, even to complete disintegration of their axial cylinder are visible.

**Pathomorphology of a chronic deep caries.**

At chronic current of a caries in hard tooth tissues the same basic layers are defined: layer of disintegration and demineralization, layer of hypercalcination (transparent dentine), the thin zone of an intact dentine (sometimes is absent) and substitutional dentine. The form of a defeat also represents a triangle, which top is directed to the party of a pulp, but its height is much less, than basis.

At microscopical research the following is taped: most of the enamel and dentine in the place of carious lesions as a result of demineralization completely destroyed and washed away from the carious cavity, on the peripheral sites on the walls and bottom of carious cavity the dentine absolutely non-structural, brown colour (pigmented) and consist of an amorphous dentine, separate fragments of a dentine, rests of meal and etc., clump of microorganisms. In a direction to a pulp this layer of a destruction passes in a zone of a demineralization.

The chronic course of a caries has some features. For it the intensive pigmentation (brown), complete, or nearly complete, absence of the softened zone and appreciable development of a transparent and substitutional dentine is inherent, and last has complite frame. Than more slowly carious process proceeds, the more appreciably feature, characteristic for a chronic caries; at a stationary caries they reach the greatest expressiveness.
In series of cases at a caries, is more often at deep, the configuration of the pulpal chamber changes at the expense of adjournment in a place of a projection of a carious cavity of so-called tertiary or irregular dentine. More often tertiary dentine has an original structure - wrong locating of dentinal canalicules, sometimes their complete absence. Dentinal canalicules have no the certain orientation, are twisting, posed spontaneously, by wrong series and are considerably narrowed, compared with appropriate in a healthy dentine. The majority of them breaks on border from normal dentin, some of them penetrate into it on small depth.

In comparison with normal dentin chemical structure of a tertiary dentine is characterizes with much greater contents of mineral components.

**Clinic of an acute deep caries**

- The patients complain of short-term pains from mechanical, chemical and temperature irritants, which pass after elimination of irritant. The disease anamnesis: a causal tooth earlier was not treated; complaints have appeared about 2-4 months ago.

  - At survey the deep carious cavity filled with a softened dentine is found out. The inlet opening is narrow, there are hanging edges of enamel. Probing of bottom of a carious cavity poorly painful (sensitive). Vertical and horizontal percussion and a mucosa palpation in the field of apex projection of tooth root are painless.

  Thermodiagnostics can cause considerable, but short-term painful reaction. The pulp reacts to a current within the limits of 10-12 мкА. Sometimes the doctor meets the transition of acute deep caries to the original form of pulpitis, can be found the attributes of pulpitis: tendinous pain in a tooth after elimination of irritant, sensation of discomfort in a tooth. In this case, the treatment is performed as an acute form of pulpitis using antibacterial therapeutic linings.

**Clinic of a chronic deep caries.**

In most cases patients complain of an acute short-term pain as a result of hit of firm particles of nutrition, which frame pressure on bottom, thermal and chemical irritants – cold, sweet, acidic, salty. After elimination of action of
irritants, the pain quickly passes. At survey the deep carious cavity with a wide inlet opening is defined. A dentine forming bottom and walls of a cavity is dense, dark colour. The reaction to probing painless, only at probing of dentin-enamel junction sometimes can arise morbidity.

The reaction on a cold irritant is sometimes morbid, quickly taking place. EOD frames sensation of a pain in a tooth at 10-12 мКА.

**Differential diagnostics of an acute deep caries.**

Differential diagnostics of an acute deep caries spend with:

- Chronic simple pulpitis;
- Chronic hypertrophic pulpitis;
- by a chronic gangrenous pulpitis;
- by a chronic middle caries;
- by a chronic deep caries.

The similarity to a chronic simple pulpitis consists available of deep carious cavity, but at an acute deep caries an inlet opening is narrow, and at a chronic simple pulpitis it is wide. At chemical, temperature, mechanical irritants in both cases there are pains, but after elimination of action of irritant at a caries a pain disappear, and at a pulpitis disturb the patient some time. At a deep acute caries EOD causes sensation of a pain at 10-18 мКА, and at a chronic simple pulpitis the pain arises in reply to a boring 40-50 мКА.

The diagnosis of chronic hypertrophic and chronic gangrenous pulpites can be excluded at once, as at these forms of a pulpitis the carious cavity is widely informed with the pulpal chamber. And at a hypertrophic pulpitis from a punched aperture it is visible pathological granulations, and at a gangrenous pulpitis only deep probing is morbid.

The acute deep caries differs from a chronic middle caries by depth of a defeat (in limits of nearpulpal dentine), and as by short-term pain sensations on chemical, temperature, mechanical irritants. At an middle caries EOD makes 2-6 мКА, and at an acute deep caries - 10-15 мКА.

**Differential diagnostics of a chronic deep caries.**
Differential diagnostic spend with:
- a simple chronic pulpitis;
- a chronic hypertrophic pulpitis;
- chronic gangrenous pulpitis;
- a hyperemia of a pulp;
- a chronic middle caries;
- an acute deep caries.

With pulpitis the chronic deep caries unites that at these diseases there is a carious cavity. At caries at action of chemical, temperature irritants in a tooth there is a localized pain, which disappears at elimination of appropriate irritants, and at a chronic simple pulpitis a pain some time is not disappear. At a caries EOD - 12-15 мкА, and at a chronic pulpitis it is more to 25-40 mkА. The diagnosis of a chronic hypertrophic and gangrenous pulpitis can be excluded at once, as at these diseases is broken bottom of the pulpal chamber, and there is a connection of a carious cavity with a pulp cavity.

At a hyperemia of a pulp occasionally there are short-term attacks of a pain, which arise spontaneously without action of irritants, pain localized. EOD at the hyperemia of a pulp - 15-20 мкА, and at a chronic deep caries - 12-15 мкА.

From a chronic middle caries it differs by depth of a carious cavity. The middle caries is in limits of a cloak dentine, and deep caries is in limits of nearpulpal dentine. At a middle caries EOD gives a pain on 2-6 мкА, and at deep - 10-12 мкА.

**Features of treatment of acute deep caries**

If to recollect the pathomorphology of acute deep caries the zone of disintegration and demineralization passes in a zone «changes in a pulp» sometimes without «healthy dentine», thus changes in a pulp have preinflammatory character.

There is a situation that it is impossible to remove up all demineralized dentine, not having opened a tooth cavity.

There are two exits from this situation:
1. To strengthen a bottom of caries cavities by remineralization of remained dentine (that is very difficult and it is necessary to apply caries-markers which will prompt which dentine can be remineralized (organic matrix is not destroyed) or can not be.

2. To force a pulp to produce tertiary dentine, that will increase durability and a thickness of dentine bottom.
# MATERIALS FOR MEDICAL LININGS:

<table>
<thead>
<tr>
<th>Material type</th>
<th>The name (firm-manufacturer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contain calcium</td>
<td></td>
</tr>
<tr>
<td>Water suspension of calcium hydroxide</td>
<td>Кальрадент (ВладМиВа), Calasept (Nordiska Dental), Calcium hydroxide (SPAD/Dentsply) Calcicur (Voco) Calcipulpe (Septodont)</td>
</tr>
<tr>
<td>Varnishes on a basis calcium hydroxide</td>
<td>Contsasil (Septodont)</td>
</tr>
<tr>
<td>Chemical hardening cements which contain calcium</td>
<td>Кальцесил (ВладМиВа) Alkaliner (3М ESPE) Dycal (Dentsply) Life (Kerr) Calcimol (Voco) Septocalcine ultra (Septodont) Reocap (Vivadent)</td>
</tr>
<tr>
<td>Light hardening polymeric materials which contain calcium</td>
<td>Кальцесил LC (ВладМиВа) Эстерфил Са (Диас) Calcimol LC (Voco) Ultra Blend (Ultradent)</td>
</tr>
<tr>
<td>Contain eugenol</td>
<td></td>
</tr>
<tr>
<td>The pastes prepared ex temporo</td>
<td>Гвоздичная paste Zinc – eugenol paste</td>
</tr>
<tr>
<td>Oficial pastes</td>
<td>Kalsogen Plus (Dentsply) Cavitec (Kerr) Zinoment (Voco)</td>
</tr>
<tr>
<td>The combined medical pastes</td>
<td>Contain antibiotics, hormonal preparations, enzymes, essence.</td>
</tr>
</tbody>
</table>

Water suspensions have feature: they do not hardening, and in 1-1,5 months they resolve under influence dentine liquids. Therefore, it cannot be put under a constant filling, i.e. apply under temporal filling, change each 1-1,5 months (treatment 3-9 months).

Varnishes are applied seldom since have weak odontotrophic action (contribute promote to produce of tertiary dentine).

Calcium-hydroxid cements – are most popular (usually paste-paste = hardening after mixing).

+ Properties: - good handling
- Low solubility in dentinal liquids
- Do not change colour of filling
- Do not break polymerisation of composite materials

Properties: - there is no adhesion to dentine
- Are dissolved by components of adhesive systems (acetone, spirit)
- Small durability on compression (can destroid under action chewing loading)

Therefore, it is better to bring in a cavity as point, in a minimum quantity with obligatory putting of an isolating lining.

**Putting of medical and isolating linings at treatment of acute deep caries**

Materials on a basis eugenol have irritating an effect on odontoblasts, therefore have strongly pronounced odontotropical action. Feature: to get mixed up very hardly.

Negative properties: - break adhesion a comp. materials;
- hardening in 10-12 hours, so are deformed under a lining or a filling. Therefore, it can use only under a temporal filling.

6. Self-monitoring materials for topic № 17:

**A. Tests with one correct answer**

1. Pathomorphological change at acute deep caries in firm tooth tissues:
   A) The disintegration zone, thin layer of intact dentine, changes in a tooth pulp is expressed;
   B) The disintegration zone is expressed poorly, well expressed zone of sclerotic and irregular dentine;
   C) Considerably expressed zones of disintegration and demineralization, there is no layer of intact dentine, considerable changes in a tooth pulp;
   D) Zone of disintegration and demineralization well expressed, a considerable layer of intact and transparent dentine, there is no layer of tertiary dentine;
   E) Disintegration zone expressed poorly, zones of sclerotic and intact dentine well expressed, considerable changes in a pulp.

2. At survey of a tooth with acute deep caries it is defined:
   A) Carious cavity in limits of enamel with a wide entrance aperture;
B) Carious cavity in limits of coat dentine with a wide entrance aperture, pigmenting dentine, hard;
C) Carious cavity in limits of coat dentine with a narrow entrance aperture, enamel chalk-shaped the fragile;
D) Carious cavity in limits of near pulped dentine with a wide entrance aperture, hard dentine, pigmenting;
E) Carious cavity in limits of near pulped dentine with a narrow entrance aperture, dentine softened, remove of layers.

3. Probing at acute deep caries:
A) Painless on a bottom, painful on dentine-enamel border;
B) Sharply painful in one point;
C) Painful on walls and a bottom of carious cavities;
D) Painless on walls, it can be sensitive on a bottom of carious cavity;
E) Painful on walls, painless on a bottom of carious cavities.

4. Percussion at chronic deep caries:
A) It is painless;
B) The vertical painful;
C) It is sensitive;
D) It is sharply painful;
E) The horizontal is painless, the vertical painful.

5. EOD at acute deep caries in limits:
A) 2-3 mkA
B) 10-12 mkA
C) 15-20 mkA
D) 25-35 mkA
E) 30-40 mkA

6. Dentine in carious cavities at acute deep caries:
A) The light yellow colour, softened, removing a layer;
B) Dark brown, black colour, removing a layer;
C) Black, dark brown colour, dense consistence;
D) It is not changed in colour, a soft consistence;
E) It is not changed in colour, dense, shining.

7. Complaints at acute deep caries:
A) The sharp pain, arises from hot, disappears after a some time after elimination of irritant;
B) Sharp pain from all kinds of irritant which disappears after their elimination;
C) Presence of carious cavities in a tooth, discomfort at the food use, connected with a food delay in carious cavities, cosmetic defect;
D) Sometimes arising unpleasant sensations at the use of very cold food, presence of carious cavities, a food delay, cosmetic defect;
E) Spontaneous pain.

7. Morphological research a tooth tissues at chronic deep caries shows:
A) The disintegration and demineralization zone is expressed, there is no zone of transparent dentine, and not considerable zone of intact dentine, replaceable dentine is not present;
B) The disintegration zone is expressed poorly, the expressed zone of transparent dentine and replaceable dentine. In a pulp changes in its various components are marked;
C) The disintegration zone is expressed poorly, changes in a pulp: odontoblasts lose the structure, permeability of capillaries increases;
D) The disintegration zone is expressed poorly, the expressed zone of transparent dentine and intact dentine, is absent a zone of tertiary dentine;
E) The disintegration zone, zone of demineralization, a considerable layer of intact dentine is expressed. Changes in a pulp it is not observed.

8. At additional research of acute deep caries reaction on cold irritant:
A) Positive, sharply painful, quickly passes after elimination of irritant;
B) It is painless;
C) Sometimes painful, quickly passes after elimination of irritant;
D) Painful, after elimination of irritant still some time remains in a tooth;
E) It is sharply painful, causes a pain attack.

9. From the anamnesis of disease at acute deep caries it is possible to find out, that:
A) Earlier in a tooth spent the endodontic treatment;
B) Tooth earlier did not treat, first signs of disease have appeared about 6-12 months ago;
C) Tooth earlier did not treat, first signs of disease have appeared about 1-2 months ago;
D) Tooth earlier did not treat, 6 months ago it was observed spontaneous pain;
E) Tooth did not treat, first signs of disease have appeared about 3 years ago.

10. At carrying out of radiological inspection in a tooth with acute deep caries it is defined:
A) Deep carious cavity with open tooth cavity;
B) Deep carious cavity, with a close tooth cavity, there are changes in a periodontium;
C) Carious cavity in limits of coat dentine, is changes in a periodontium;
D) Deep carious cavity with open tooth cavity, is changes in a periodontium;
E) Deep carious cavity, with a close tooth cavity, without changes in a periodontium.

Self-monitoring materials for topic № 18:
A. Tests with one correct answer
1. Water suspension of Calcium hydroxide used for:
A) Constant filling;
B) As material for temporary fillings and hermetic bandage;
C) Isolating liners.
D) Constant filling of root canals;
E) Medical linings;
2. Negative properties of eugenol containing paste:
A) break adhesion a composite materials;
B) has hardening time 10-12 hours;
C) can be deformed under a lining or a filling;
D) can irradiate the pulp;
E) All answer true.

3. At treatment of acute deep caries for medicamentous processing of carious cavities use following solutions:
   A) Spirit of ethyl 70 %;
   B) Solution of sodium hypochloride 5,25 %, a solution of hydrogen peroxide 6 %;
   C) Solution furacyline 0,02 %, a solution of hydrogen peroxide 3 %;
   D) Solution of resorcyne 10 %, a solution of hydrogen peroxide 3 %;
   E) Campforophenole.

4. Properties of a medical lining are:
   A) Mummification action;
   B) Odontotrophic action;
   C) Toxic action;
   D) Anti-carious action;
   E) All answers are true.

5. Anti-inflammatory and remineralization action calcium content pastes applied at treatment of acute deep caries, is provided with level pH, equal:
   A) 5;
   B) 18;
   C) 15;
   D) 10,5;
   E) 12,2.

6. If strong chewing pressure is put upon a seal at treatment of acute deep caries, in that case on a bottom of carious cavity it is necessary to impose a medical lining:
   A) The combined action, containing an antibiotic;
   B) Calcium content lining «Life» (Kerr);
   C) Calcium content lining «Dycal» (Dentsply);
   D) Calcium content lining «Contrasil»;
   E) Zinc-oxide-eugenol lining.

7. A medical lining at treatment of chronic deep caries on a bottom of carious cavities:
   A) Do not impose;
   B) Impose on the opened horn of a tooth pulp;
   C) Impose on a bottom and walls of carious cavities;
   D) Impose on a bottom of carious cavities;
   E) Do not impose on walls of carious cavity.

8. Term of imposing of medical lining:
   A) 1-3 days are not less 14 days;
   B) From several days till 6 month;
   C) There are less 12 months;
   D) There are more 14 days;
   E) All answers are true.

9. Technique of imposing of medical lining:
   A) Thin layer on a bottom and walls of carious cavities to dentine-enamel border;
   B) Thin layer of 0,5-1 mm on a bottom of carious cavities or punctually in area of proection of pulp horns;
C) Thin layers of 0.5-1mm in a site of dentine-enamel border;  
D) Layer in the thickness of 1-1.5 mm on a bottom and walls of carious cavities;  
E) Thin layer only on walls of carious cavities.  

10. A technique of removal of a temporary seal with chemical hardening Ca-content treatment lining:  
A) In following visiting leaves completely;  
B) In following visiting remains completely;  
C) In following visiting 2/3 parts of a temporary seal leave and 1/3 part remains under a constant seal;  
D) In the following visiting 1/3 part of a temporary seal and 2/3 part remain under a constant seal as a medical lining;  
E) All answers are true.  

B. Clinical tasks:  
1. Patient appeals to stomatology with complaints at acute pain in a mandible tooth on the right from thermal, mechanical and chemical irritants, it quickly disappears after stopping of their action. At survey: in second molar there is deep carious cavity within nearpulpal dentine. Dentine is softened, weakly pigmented. The entrance aperture narrows with hanging edges of enamel. Probing of caries cavity bottom is poorly painful (sensitive), but connective with tooth cavity is not educed. Vertical and horizontal percussion and palpation of mucosa in the field of apex's root projection are painless. Put a previous diagnosis.  
   A. Acute deep caries 47  
   B. Acute deep caries 37  
   C. Acute middle caries 47  
   D. Chronic deep caries 37  
   E. Chronic fibrous pulpitis 47  

2. A 51-year-old female patient complains about food sticking in a right inferior tooth. Objectively: distal masticatory surface of the 45 tooth has a deep carious cavity filled with dense pigmented dentin that doesn't communicate with the tooth cavity. The patient was diagnosed with chronic deep caries. What method of examination allowed the dentist to eliminate chronic periodontitis?  
   A. Electro-odontometry  
   B. Probing  
   C. Palpation of projection of root apex  
   D. Percussion  
   E. Cold test  

3. A 22-year-old patient undergoes treatment for acute deep caries of the 26th tooth. The pulp-capping material of choice is Ca(OH)2/salicylate cement "Life", the constant filling material is ligh-cure condensable composite "Solitaire-2". The pulp cap should be covered with:  
   A. Glass-ionomer cement  
   B. Adhesive composite system  
   C. Insulating varnish  
   D. Phosphate cement
4. A 23-year-old patient complains about a carious cavity in the 15 tooth that he noted a year ago. Examination revealed that approximal surface had a deep carious cavity not communicating with the tooth cavity and filled with dense pigmented dentine. Probing, cold test, percussion cause no pain. Electroodontodiagnosis is 10 microampere. What is the most likely diagnosis?
   A. Chronic deep caries
   B. Chronic fibrous periodontitis
   C. Chronic fibrous pulpitis
   D. Chronic median caries
   E. Chronic granulomatous periodontitis

5. A 35-year-old patient complains about a cavity in a lower jaw tooth on the left, and the pain caused by sweet, sour and solid food. Examination of the 36 tooth revealed a deep carious cavity filled with light softened dentine. Probing of the carious cavity floor is painful, reaction to the cold stimulus is painful, undurable. What is the most likely diagnosis?
   A. Acute deep caries
   B. Acute focal pulpitis
   C. Chronic fibrous pulpitis
   D. Acute median caries
   E. Chronic deep caries

6. 23-year-old female patient complains of short-term pain caused by thermal stimuli in a lower jaw tooth on the right. Objectively: on the occlusal surface of the 46 tooth there is a deep cavity with softened light dentin on the floor and walls. Probing causes a slight pain across the cavity floor. Pulp electroexcitability is 10 mA. During the cavity preparation a drop of blood showed up on its floor. What paste should be applied to the cavity floor?
   A. Calcident
   B. Corticosteroid
   C. Arsenous
   D. Paraformaldehyde
   E. Resorcinol-formalin

7. A 25-year-old patient complains of pain caused by eating sweet, hot and cold food; pain ceases, when stimulation stops. Objectively: the adjoining surface of the 36th tooth has a deep carious cavity localised in the circumpulpal dentin. The dentin is softened. Probing of the carious cavity floor is painful. What is the most probable diagnosis?
   A. Acute deep caries
   B. Acute median caries
   C. Chronic fibrous pulpitis
   D. Chronic median caries
   E. Chronic deep caries

8. A patient complains of acute short-term toothache caused by thermal and chemical irritants. The tooth has not been treated before, the pain arose about a
month ago. Objectively: on the occlusal surface of the 36 tooth there is a deep carious cavity within circumpulpal dentin with overhanging chalky enamel. Probing of the cavity floor causes slight pain. There is also short-term pain from the cold stimulus. The result of electric pulp test is 8 microamperes. What is the most likely diagnosis?

A. Pulp hyperemia
B. Chronic deep caries
C. Acute deep caries
D. Acute median caries
E. Chronic fibrous pulpitis

9. To fill a medium depth carious cavity in the 37 tooth (Black class II) of a 35-year-old male patient a doctor has chosen a technique of layer-by-layer tooth restoration. What composite material should be applied for covering the carious cavity walls and floor to create the initial super adaptive layer?

A. Microhybrid
B. Condensable
C. Macrofilled
D. Flowable
E. Microfilled

10. A 48-year-old patient has addressed a hospital with complaints of defects in the paragingival area and slight sensitivity to thermal stimuli. Objectively: there are hard tissue defects that resemble a wedge with smooth polished walls on precervical vestibular surface of the 23 and 24 teeth. Thermal test is slightly positive. What is the most likely diagnosis?

A. Cuneiform defect
B. Acute deep caries
C. Enamel necrosis
D. Enamel erosion
E. Endemic fluorosis

11. A 23-year-old woman complains of carious cavity present in the 27 tooth, where food particles are retained. Objectively: there is a deep carious cavity on the masticatory surface of the 27 tooth filled with dense dark-brown dentin. Probing of the cavity floor and walls is painless, thermometry and percussion are painless. Electric pulp test - 10 microamperes. X-ray reveals no pathological changes. Make the diagnosis:

A. Chronic deep caries
B. Chronic fibrous pulpitis
C. Chronic median caries
D. Acute deep caries
E. Chronic periodontitis

12. A 25-year-old female patient consulted a dentist about acute pain in the mandible on the right that occurs during eating. Objectively: the approximate distal surface of the 45 tooth exhibits a carious cavity filled with light softened dentin. Probing causes a minor pain response across the entire floor. Percussion causes no
pain. Cold water causes transient pain. What is the most likely diagnosis?

A. Chronic deep caries
B. Chronic median caries
C. Acute median caries
D. Chronic fibrous pulpitis
E. Acute deep caries

13. An 11-year-old boy complains of a short-term pain from the cold in the left mandibular tooth. Objectively: the medial surface of the 36 tooth exhibits a carious cavity within parapulpar dentin. The cavity is filled with light, softened dentin and does not communicate with the cavity of the tooth. Probing the of the 36 tooth floor causes pain response, the tooth is not sensitive to percussion, the response to the cold stimulus does not remain long after its removal. What is the most likely diagnosis?

A. Acute deep caries
B. Chronic fibrous pulpitis
C. Acute diffuse pulpitis
D. Acute focal pulpitis
E. Acute median caries

14. 35-year-old patient has been diagnosed with chronic deep caries of the 36 tooth. There is a Black’s class II cavity affecting masticatory surface. What material should be chosen for the tooth filling?

A. Light-cure microhybrid composite
B. Glass ionomer cement
C. Silicophosphate cement
D. Light-cure fluid composite
E. Light-cure microfilled composite

7. Recommended literature

Base:
947 p.

9. Lecture material on discipline “Therapeutic Stomatology”.

**Additional:**


**Information resources on the Internet:**

- http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the the candidate of medical sciences, **docent Marchenko Irina Jaroslavovna**
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

<table>
<thead>
<tr>
<th>Educational discipline</th>
<th>Therapeutic Stomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1:</td>
<td>1: Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td>Content module № 2</td>
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<tr>
<td>Faculty</td>
<td>Stomatological</td>
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</tbody>
</table>
1. **Relevance of the topic**: dental caries is the most common disease among the population of all age groups. Complications caused by caries lead to a significant impairment of chewing effectiveness, which is subsequently manifested by various pathologies of the gastrointestinal tract and impaired many types of metabolism. Cosmetic defects in carious lesions are often the cause of many moral agony and psycho-emotional trauma of patients. It is logical that knowledge of the manifestations of caries at its various stages is necessary for future dentists to successfully diagnose, effectively treat and reliably prevent the most widespread dental disease.

2. **Specific goals**:

   1) **Know**: Medicinal pastes for the treatment of acute deep caries.
   Master the skills:
   1) Dissection of the cavity in deep caries.
   Master the technique:
   1) Imposition of odontotropic paste in the treatment of acute deep caries.
   2) Additional survey methods:
   A) thermal diagnostics;
   B) electrical odontodiagnostics;
   Be able to:
   To assess the condition of the tooth pulp during the two-step method of treatment of deep caries.

3. **Basic knowledge, experience, skills necessary for studying the topic**

   (interdisciplinary integration)

<table>
<thead>
<tr>
<th>Names of previous disciplines</th>
<th>To know</th>
<th>To be able to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Histology</td>
<td>Histological structure of hard tooth tissues</td>
<td>To distinguish on radiographs the structural and functional elements of enamel, dentin, pulp.</td>
</tr>
<tr>
<td>2. Anatomy</td>
<td>The topography of the localization of carious defects relative to different tissues of the tooth.</td>
<td></td>
</tr>
<tr>
<td>3. Pathological physiology</td>
<td>Reactive pulp changes in response to the development of various forms of caries</td>
<td>. Simulate functional changes in the pulp in response to the development of carious process</td>
</tr>
<tr>
<td>4. Surgical Dentistry</td>
<td>Possible complications caused by complicated</td>
<td>To conduct adequate treatment and</td>
</tr>
</tbody>
</table>
The theoretical questions to the lesson:

1. Types of pain relief in the treatment of acute deep caries.
2. Prescribe medications for the treatment of acute deep caries.
3. Features of preparation of the carious cavity in acute deep caries.
4. The concept of odontotropnoy paste. The mechanism of its action.
5. Write down some odontotropnyh drugs
6. The concept of temporary fillings.
7. The concept of hermetic dressings.
8. Materials for temporary fillings.
9. Technique overlay odontotropnogo paste.
10. Technique of imposing temporary fillings.
11. The method of single treatment method.
12 The method of two-session treatment of acute deep caries.

5. The contents of the topic
treatment of acute deep caries.

I. Dissection.
It begins with the preparation of the cavity.
Due to the large depth of the lesion of hard tissues, preparation is often painful, which necessitates prior anesthesia. Injectable anesthesia is most commonly used.
Cavity preparation includes:
1. Opening the cavity;
2. Necrotomy;
II. Drug treatment.
Due to the fact that the partition between the bottom of the carious cavity and the vault of the pulp chamber is thin and unreliable, concentrated or potent sterilizing solutions cannot be used for drug treatment, therefore, most often for this purpose they use 3% hydrogen peroxide solution, 3% sodium hypochloride solution. etc.
III. The next stage of treatment is the imposition of a medical strip on the bottom.
All therapeutic pads must have the ability to stop the inflammatory processes in the pulp, stimulate the production of irregular dentin by the odontoblasts, therefore they are called odontotropic. Paste based on medicated oils - clove sea buckthorn, cedar, tea tree oil, eugenol (alcohol extract of unripe fruits of the clove tree), etc., and a large group of calcium hydroxide preparations:
IV. After applying a medical pad, acute deep caries can be treated in two ways:
Treatment of acute deep caries in one visit.
On top of the medical pad, an insulating pad of water dentin is applied, which quickly solidifies and reliably insulates the pad. The imposition of a medical pads based on calcium hydroxide on top of an isolating phosphate-cement pads is contraindicated because the main component of such a paste, reacting with phosphoric acid liquid phosphate - cement, is inactivated, therefore between the gasket from the odontotropic paste and the phosphate cement needs a gasket from aqueous dentin.
Overlaying an isolation lining made of glass ionomer cement.
The insulating gasket must exactly repeat the shape of the carious cavity and reaches the level of the enamel-dentine boundary. After this, the carious cavity is filled.
After selecting the material, prepare it and restore the anatomical shape of the tooth. When there is no firm certainty that the carious process did not involve the pulp in a state of inflammation, and this can be clarified using the data of electrical odonto-diagnostics, the treatment is carried out in two sessions. With this method of treatment, a control seal of dentin water or dentin paste is applied to the treatment strip for a period of 12 to 14 days, there are special materials for applying temporary fillings, such as Vinoxola.
After a specified period, the patient comes to the second visit. If the dynamics are positive: there are no complaints, the reaction to percussion is negative, the reaction to temperature stimuli is negative, remove ⅔ of the control seal, put an isolation lining of glass ionomer cement into the cavity and impose a permanent seal.

Treatment of chronic deep caries.
The first stage of treatment is the preparation of the carious cavity.
The second stage of treatment is the antiseptic treatment of the carious cavity.
Drug treatment is usually carried out with 3% hydrogen peroxide solution, 3% sodium hypochloride solution.
After medical treatment impose an isolation lining.
The purpose of the gasket in the treatment of chronic deep caries is to isolate the pulp from the toxic effect of the filling material and temperature fluctuations. The lining is superimposed of glass ionomer cement, repeats all the contours of the formed carious cavity and reaches the dentinal-enamel border.
The imposition of a permanent seal is carried out after selecting the appropriate material. Composite materials are used to seal the frontal teeth; for lateral teeth, cements, amalgams, and composites are used.

1. Self-monitoring materials:
Tasks for self-control

1. In the first visiting at treatment of sharp deep caries impose a temporary seal with calcium content medical lining, for a period of:
A) 5 days.
B) 2-3 days;
C) 1-2 days;
D) 1 day;
E) 7-14 days;

2. Preparations of carious cavities at acute deep caries includes following stages:
A) Necrectomy, burnisher of edges;
B) Necrectomy, formation;
C) Disclosing, formation, necrectomy;
D) Disclosing of carious cavities, necrectomy, formation;
E) Disclosing, formation.

3. A medical lining impose on purpose:
A) Differentiations juxta pulpal dentine and filling material;
B) Increases of mechanical stability juxta pulpal dentine;
C) Stimulations of protective mechanisms of a tooth pulp;
D) Fixing improvements of filling material;
E) Do not apply.

4. On a way of imposing medical linings at treatment of acute deep caries are applied:
A) For a direct covering of a tooth pulp;
B) For an indirect covering of a tooth pulp;
C) For partial imposing on walls of carious cavities;
D) For devitalization of tooth pulps;
E) For full closing of carious cavities.

5. The preparation liquid «Кальмецин» represents:
A) The distilled water;
B) Solution of methylcellulose;
C) Solution of chloramyne;
D) Ortophosphoric acid;
E) Hypertensive solution.

6. At treatment of acute deep caries use following linings:
A) On a basis of eugenole and окиси zinc oxide;
B) From glass-ionomer cement;
C) On a basis of iodoforme;
D) From cement zinc-phosphatic;
E) From siliko-phosphatic cement.

7. For antiseptic processing of carious cavities at treatment of acute deep caries use:
A) Spirit of ethyl 96 %, solution of peroxide of hydrogen of 4 %;
B) Solution of peroxide of hydrogen of 6 %, a solution of rivanole 0,05 %;
C) Solution of peroxide of hydrogen of 3 %, a solution of rivanole 0,05 %;
D) Solution of hypochloride of sodium of 5,25 %, solution of chloramine 10 %;
E) Solution of hypochloride of sodium of 6 %, a solution of chloramine 5 %.

8. Removal necrotic dentine from a bottom of carious cavities at treatment of acute deep caries spend:
A) Smooth;
B) Diamond bur on a turbine handpiece;
C) Excavator;
D) Probe;
E) Hard-alloy bur on a turbine handpiece.

9. If strong chewing pressure is put upon a seal at treatment of acute deep caries, in that case on a bottom of carious cavity it is necessary to impose a medical lining:
A) The combined action, containing an antibiotic;
B) Calcium contain lining «Contrasil»;
C) Calcium contain lining «Dycal» (Dentsply);
D) Calcium contain lining «Life» (Kerr);
E) Zinc-oxid-evgenole lining.

10. A medical lining at treatment of chronic deep caries on a bottom of carious cavities:
A) Do not impose;
B) Impose on the opened horn of a tooth pulp;
C) Impose on a bottom and walls of carious cavities;
D) Impose on a bottom of carious cavities;
E) Do not impose on walls of carious cavity.

7. Recommended literature

**Base:**

**Additional:**

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The methodical reference is made by the assistant Lobach L.M.
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1. **Relevance of the topic:** the topic is very important for future doctors in their professional activity, positively influences the students in their attitude to the future profession, forms professional skills and experience as well as taking as a principle the knowledge of the subject learnt.

2. **Specific goals:**
   - To have general knowledge of the topic studied;
   - To understand, to remember and to use the knowledge received;
   - To learn the classification, structure, functions;
   - To form the professional experience by reviewing, training and authorizing it;
   - To be able to carry out laboratory and experimental work.

3. **Basic knowledge, experience, skills necessary for studying the topic (interdisciplinary integration)**

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4. Tasks for independent work during preparation for employment and at the lesson

4.1. **Theoretical questions to the lesson:**

1. The reasons of development of Acutissimus caries
2. Features of current
3. What changes from a saliva and blood are observed at patients with the acutissimus (Acutissimus) caries?
4. With what formation of a plenty soft dental plaque such patients is connected?
5. Why at the acutissimus (Acutissimus) caries secondary caries often develops, the put earlier seals drop out?
6. In what the general pathogenetic treatment consists?
7. Name medicinal substances which have immunostimulating action.
8. What medicinal substances stimulate allocation of a saliva?
9. What substances regulate the maintenance of mineral substances in an organism?
10 Features of operative treatment of Acutissimus caries.

5. **The contents of the topic:**

The acutissimus (Blossoming) caries represents a variant of sharp current. However, presently the certain contingent of the population is exposed to the extreme influences reflected, in particular, on immunobiological condition of an organism. Thus caries of the teeth, described exclusive aggression of current develops.
Treatment and preventive maintenance of the acutissimus (Acutissimus) form of caries make necessary it allocation as independent form of disease. It is a question of intensive development of caries of a teeth and its aggressive current not only at chronically proceeding collagenic diseases, a tuberculosis, a diabetes, but also after the transferred acute infectious diseases. It is proved, that with development of the acutissimus (Acutissimus) caries are fraught beam and intensive corticosteroid therapy, so widespread today a sensitization of an organism, antiinfectional immunization of an organism. For the acutissimus (Acutissimus) caries plural defeat (not less than 7-8 of carious cavities), presence of several cavities (4-5) in one tooth, almost asymptomatic current, the tendency to steady progressing and the subsequent occurrence of secondary caries, the leader to intensive destruction of a teeth, and also presence of complicated caries is characteristic. For very short time a teeth, including so-called steady against caries teeth - canines and the bottom incisors are amazed almost all. The acutissimus (Acutissimus) caries is localized not only on surfaces of a teeth usually subject to thus disease, but also on so-called immune surfaces. The majority of defeats is found out on lip, buccal and contact surfaces. On occassion the palatal surfaces are amazed. On one tooth appear some carious centers. On the average on one tooth there are 2,26 of carious defects. In such cases cavities merge, therefore in dentin cavities of the significant sizes above which hang the fragile enamel bridges, deprived a subject dentin are formed. Thus conditions for breakage of enamel are created. Enough early process becomes complicated an inflammation of a pulp. The primarily-chronic pulpitis quite often develops. The painful syndrome at the acutissimus (Acutissimus) caries also is not leader. At an exposure of dentin-enamel junction the patients can complain of the painful sensations arising under action of a cold. Some patients, suffering this form of caries, do not mark painful sensations.

At inspection of patients the abundance of a dental plaque, high viscosity of a saliva attract attention. Intensive adjournment of a dental plaque is observed even at careful care of a teeth.
Caries in a stage of a spot is often combined with the developed forms of this disease in same and other teeth. Carious defect of enamel thus has no attributes of delimited process.

Laboratory research of blood and saliva of such patients, as a rule, allows to come to conclusion about the expressed change of natural resistibility of an organism. As a rule, at such patients activity of lysozyme of blood, of parotid and of the mixed saliva is lowered. The mineral structure of a saliva changes also: the maintenance of alkaline phosphotase decreases, and phosphorus - increases. The maintenance of calcium and potassium in a saliva is increased, and sodium - is reduced. Bacterial action of integuments is lowered. Infringements of functions of vegetative nervous system are found out in such patients, its lability. Pallor of integuments, downturn of its turgor, propensity of epithelium of skin to raised desquamation can be observed.

Treatment of Acutissimus caries should be spent in the form of complex influence on immunobiological condition of an organism, stimulation of activity of salivary glands, etc.

1. Influence on nonspecific resistency of an organism consists in purpose of a diet with the increased maintenance of the fiber, nonsaturated oils. Products which contain calcium (milk, cottage cheese, cheese, egg yolks, nuts, beans, meat), fluorine (tea, salad, mineral water, peaches, carrots), phosphorus (a fish, meat, a soya, an apricot, a cherry, plum).

2. Medicamentous influence consists in purpose of nucleinate of sodium, orotate of potassium, riboxine, pentoxile, etc.

3. Obligatory is purpose of vitamins: C, B6, A, E, D.

4. Purpose of mineral substances:
   - gluconate, glicerophosphate, lactate of calcium - on 0,5 g 3 times a day during 1-2 months, 2-3 rates in a year
   - Preparations which contain fluorine - fluoride, fluorate of sodium - on 1 mg 2 times a day during 2-3 months
   - Preparations of phosphorus - phytin - on 0,25 g 3 times a day 1-1,5 months, 2 rates in a year.
5. For stimulation of function of salivary glands appoint dietotherapy with the increased maintenance of firm, sour, spicy food, broths of medicinal grasses. With the same purpose appoint Bromgexinum on 0.004-0.008 g 1-2 times a day during 2 weeks.

6. The general UVR is useful.

Local treatment is spent depending on the form of caries. Especially carefully at preparation it is necessary to spend necrectomy and preventive expansion of carious cavity with the purpose of preventive maintenance of recurrent caries. It is necessary widely to apply odontotropic pastes to preventive maintenance of development of caries even at acute middle caries. A necessary condition at Acutissimus caries is visiting the stomatologist in 2 weeks after sealing. Patients with Acutissimus caries should be taken on dispensary registration and visit the stomatologist 3 times in a year. Visitings combine with application of remineralizing solutions.

Features of treatment of Acutissimus caries consist in the following:
- Association of local treatment with the general in view of a condition of an organism of the patient;
- The maximal volume of treatment in each reception of the patient;
- Use modern filling materials with high adhesion;
- Constant supervision over the patient;
- Preventive measures.

1. Self-monitoring materials:

2. Tasks for self-control

1. The reasons which lead to occurrence of "blossoming caries»:
   A) Bad hygiene of an oral cavity;
   B) Xerostomy, collagenose;
   C) The use of a considerable quantity of carbohydrates;
   D) The increased content of fluorine in water;
   E) Antiinfection immunization of organism.

2. At survey of an oral cavity of the patient with plural caries it is observed:
   A) Simultaneous defeat of 2-3 teeth (molars and premolars);
   B) Simultaneous defeat of 7-8 and more teeth (the bottom incisors and canines);
   C) Simultaneous defeat of 3-4 teeth (molars with cavities of 1 class by Black);
D) Simultaneous defeat of 3-4 teeth (molars with cavities 1 and 2 classes by Black);
E) Simultaneous defeat of 3-5 teeth.
3. In the disease anamnesis at blossoming caries the patient marks:
A) Illness first signs has noticed 2 years ago, for treatment did not address;
B) Illness first signs have noticed 2-3 weeks ago, marks loss before the put seals;
C) Illness first signs have noticed 6 months ago;
D) Illness first signs have noticed one year ago, for treatment did not address;
E) Illness first signs has noticed 1,5 year ago.
4. At patients with plural caries it is marked following changes in a saliva:
A) Increase of level of phosphorus, potassium, calcium;
B) Decrease in level of phosphorus, potassium, calcium;
C) Decrease in the content alkaline of phosphates, sodium;
D) Truly A, C;
E) Truly B, C;
5. The patient at plural caries complains on:
A) Sharp pain from all kinds of irritants which does not disappear after it's elimination;
B) Insignificant painful sensations from cold, considerable quantity of carious cavities, loss of seals;
C) Sometimes arising unpleasant sensations at the use of firm food;
D) Pain from hot, a night pain;
E) Cosmetic defects.
6. At the general treatment of plural caries apply medical substances stimulating work of salivary glands. To such preparations carry:
A) Bromhexyde on 0,004-0,008 2-3 times a day;
B) Pentoxile 2-3 times a day, potassium orotate on 0,5 3 times a day;
C) Ginseng preparations, eleuterococce;
D) Calcium glycerophosphate on 0,5 2 times a day;
E) Ergocalciferole.
7. At the general treatment of plural caries for stimulation of salivation and decrease in viscosity of a saliva appoint:
A) Sodium nucleinate on 0,1 g 2 times a day;
B) Potassium orotate on 0,5g 3 times a day;
C) Infusion mother - and - stepmothers, thermopsise;
D) Eleuterococce;
E) Ergocalciferole.
8. For influence on immunobiological condition of an organism of the patient at treatment of plural caries use:
A) Sodium nucleinate on 0,05 0,1g 3-4 times a day;
B) Lyncomycine in injection;
C) Thermopsise, inulae helenii;
D) Calcium glycerophosphate on 0,5g 2 times a day;
E) Truly all.
9. Features of local treatment of plural caries consist in:
A) Use of odontotrophic pastes, as linings, constant sealing - glass-ionomer cement;
B) Use zinc-phosphate cement as linings, constant sealing - silicophosphatic cement;
C) Use adhesive technique at sealing;
D) Use zinc-phosphate cement as a lining, constant sealing of light hardening composite;
E) Use as a lining of phosphate cement, constant sealing - zinsulphate cement.

10. Features of operative processing in carious cavities at treatment of plural caries consists in:
A) Removal of all necrotic dentine, is left by hanging edges of enamel;
B) Removal of all necrotic dentine, hanging edges of enamel also delete;
C) Preparation spend in the technique of adhesive sealing;
D) Tunnel preparation;
E) In application of ART technique.

6. Recommended literature

Base:

Additional:

Information resources on the Internet:
- http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the assistant Lobach L.M.
Methodical Instruction

for independent work of students
during preparation for practical classes and in classes

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<td>“Caries and not carious defeats of teeth”</td>
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1. Relevance of the topic:
The Clinical practice and scientific researches testify, that prevalence of caries in some countries reaches 80%. The statistical data published in the countries of northern Europe, testify that growth of this disease proceeds. Abundantly clear, that growth of stomatologic diseases, their prevention, treatment and Caries prevention program makes the most actual problem of modern medicine.
Caries prevention program is a system of the social medical, hygienic measures directed on prevention of diseases by elimination of the reasons and conditions of their occurrence and development, and also on increase of stability of an organism to influence of adverse factors of the surrounding natural, industrial and household environment, capable to cause pathological changes.

2: Specific goals:
=To familiarize with ways improvement of an organism: the organization of a high-grade feed - restriction reception of carbohydrates, reception of tough food, the organization a mode of work and rest;
To know:
- methods of rational hygiene of an oral cavity;
- ways of increase of salivation;
- necessity and the most rational terms of elimination of tooth-jaw deformations.
To be able;
- to spend removal of dental adjournment correctly;
- to train patients in a correct technique of cleaning of a teeth.
To seize:
- a technique of carrying out remineralizing therapy;
- technics of closing of fissuras and blind fossas;
- technics of processing of a teeth fluoric preparations.

3. Basic knowledge, experience, skills necessary for studying the topic (interdisciplinary integration)
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<td>Physiology</td>
<td>Physiology of digestion.</td>
<td>To make a rational mode of a life, a feed</td>
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<tr>
<td>Hygiene</td>
<td>The Rational food allowance, containing necessary components.</td>
<td>Make The Rational food allowance, containing necessary components.</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>Structure and dosage of vitamins, Necessary for increase of resistency of enamel. The mechanism of action of preparations of fluorine on hard tissues of a tooth.</td>
<td>To appoint necessary vitamins for reception anticarious effect. To apply preparations of calcium, phosphorus to reception anticarious effect.</td>
</tr>
<tr>
<td>Prevention of stomatological deseases</td>
<td>Hygienic means for care of an oral cavity</td>
<td>Correctly to clean a teeth by means of tooth-brushes with use of tooth-pastes, powders, elixirs.</td>
</tr>
</tbody>
</table>

4. Tasks for independent work during preparation for employment and at the lesson

**4.1. Theoretical questions to the lesson:**

1. What is the caries prevention program of a teeth?
2. What preventive measures are directed on elimination of cariogenic situations?
3. What there are ways of increase of resistency of enamel of a tooth?
4. The measures raising health of mother, as means of primary caries prevention program.
5. Value of a balanced diet of mother for formation of dental tissues?
6. Value of chest feeding the child for caries prevention program?
7. Value of restriction of carbohydrates in a diet of teenagers?
8. Value of the prevention and treatment tooth-jaw anomalies in caries prevention program of a teeth?
9. Value of fluorine in caries prevention program and an opportunity of its application?
10. Opportunities of application of preparations of calcium and phosphorus with the purpose of caries prevention program.
11. Value of hygiene an oral cavity in caries prevention program?
13. The technique cleaning of a teeth.
15. Value of sanitation of an oral cavity in caries prevention program?

5. The contents of the topic: Proceeding from modern representation about the reason of occurrence of caries of a teeth, its prevention can be carried out by a complex of the measures directed, on the one hand, on elimination of a cariogenic situation in an oral cavity, and with another - on increase of resistansof tissues of a teeth.

To measures of elimination of cariogenic situations concern: improvement of an organism; restriction of reception of carbohydrates; a diet; reception of tough food; hygiene of an oral cavity; improvement of salivation; elimination of tooth-jaw deformations; closing of fissuras and blind fossas of a tooth.

There are next ways of increase of resistency of enamel of a tooth: a correct formation and development of tissues of a tooth; high-grade maturing of enamel; remineralizing therapy; application of fluoride preparations (the general and local action).

In conformity with costing problems Caries prevention program should be begun with intra-uterine development of a fetus and to continue during all human life. In connection with that development of a fetus in a huge degree depends on a
condition of the pregnant woman, the first stage of Caries prevention program is the care of health of future mother (a rational mode of the life, the balanced feed, the prevention of diseases, and at their occurrence - early and active treatment. A feed of the pregnant woman should include wide assortment of proteins (first of all a phytogenesis), carbohydrates, fats. The significant part of the specified substances should be digestible (milk, cheese, a butter). Consumed products should contain also in enough mineral components and vitamins. Important optimum maintenance of a microcell of fluorine in potable water (about 1 mg/l).

After a birth of the child creation of high-grade structures of tissues depends on a condition of its health - first of all influence of general diseases. Receipt in an organism of necessary nutrients is necessary. For feeding the parent milk containing an optimum set of necessary nutrients, and also biologically active components - hormones, antibodies, vitamins, microcells always will be irreplaceable.

This complex of substances at long enough feeding provides to the child during the early period of development passive immunity. 

At school age there is a change of a dairy teeth with constants, and in the further replacement, maturing (an additional mineralization) enamels up to 15 - 17 years. It is necessary for considering at definition of an optimum diet of the pupils. It is necessary to include in a food allowance enough of fruits, vitamin-rich and mineral salts. Bakery products, groats, pasta should not exceed recommended norms.

Exclusively the great value has also a diet. The certain number of receptions of food within day and exception of the use of sweets in intervals between them considerably reduce an opportunity of development of caries.

The significant role in Caries prevention program of a teeth is played with the prevention and elimination developed tooth-jaw deformations. The orthodontic treatment directed on normalization of crisis, elimination of density of a teeth, reduction of occurrence of caries.

From the numerous microcells acting in an organism of the person with foodstuff and food water, the greatest anticarious action fluorine differs. The most effective influence of fluorine is observed at its optimum receipt in an organism during
development of a mineralization and the subsequent maturing of enamel of a teeth. The most widespread method of Caries prevention program of a teeth now is artificial fluorining potable water (up to concentration of 1 mg/l), that provides decrease in desease by caries on 30 - 50 %. The World Health Organization recommended to apply a method of fluorining in all countries. The mechanism anticarious actions of fluorspeaks first of all formation in enamel of resistant structures, steady against action of acids due to transformation hydroxiapatites in ftorapatites at replacement of hydroxile groups (OH-) on fluorine (F-). Alongside with it a number of authors is cited by data, that fluors renders direct influence on a dental plaque, suppressing acid-formation of microorganisms of a dental plaque. In conditions when it is not obviously possible to make fluorining potable water or separate food stuffs (milk, salt, etc.), fluors can be entered into an organism in the form of tablets at the rate of optimum daily receipt in quantity 1,2 - 1,6 mg. Anticarious effect from application of tablets of fluors of sodium depends on age with which reception begins, and also from duration and a regularity (not less than 250 days in a year) their uses. Tablets should be appointed from 2 years and to continue their reception till 14 years.

Daily within 2,5 years the use of the tablets containing 2,2 mg of fluors of sodium, reduces intensity of caries on a constant teeth at 7 - 8 years children on the average on 57 %. Alongside with introduction of fluors inside resistency of enamel of a tooth to caries can be raised by local application of fluors. It can be applied in the form of application of solutions, rinsings, a covering of a teeth a varnish, cleanings of a teeth by fluorin-conteining pastes, gels.

Increase of resistency of dental tissues by their processing of remineralizing solutions which basic components are calcium and phosphate is perspective. Distribution was received applicational remineralizing therapy with application of 10 % of a solution of gluconate in a combination to 2 % solution of fluors of sodium. In the beginning a surface of a tooth clear by tooth-brush and any hygienic tooth-paste, and then wash out the wadded tampon humidified by a solution of peroxide of hydrogen. After that a surface of the teeth isolated from a saliva dry up a jet of warm air and on 15-20 minutes Impose a tampon humidified of 10 % by a solution of gluconate of calcium.
Then on 1 - 2 minutes put a tampon moistened by 2 % solution of fluoride of sodium. The given procedure is spent three times (per day) everyone half a year, reducing a gain of caries of a teeth on 24 % and more.

Preventive processing by remodent is spent by a following technique: we spend cleaning a teeth by hygienic paste, a teeth isolate from a saliva and dry up a current of air. After that in the dishes made of plastic, place the wadded tampons plentifully moistened by 1 - 3 % solution remodent, then put them on a teeth. Duration of procedure 15 - 20 mines, repeated processing is spent through 2 - 3 days. In a year it is carried out 3 - 4 similar rates.

Clinical supervision have shown, that three-year application of a solution remodent in the form of applications provides decrease in desease by caries approximately on 45 %. Anticarious action is rendered with a tooth-paste “remodent”. The mechanism of action of this paste consists that it reduces an index of hygiene of an oral cavity and increases acid resistency of enamel of a teeth of the person.

At purpose of measures of Caries prevention program for elimination of cariogenic situation the big attention is given to a diet. V.K.Leontev has suggested to introduce “ culture of consumption of carbohydrates ” which essence is reduced to the following: 1) not eat sweets for the night; 2) to not use sweet as last dish; 3) not eat sweet between receptions of food.

In the prevention of caries plays a role also reception of the rough food, having the expressed clearing effect. Fruits, vegetables and rough food is necessary for recommending everything, especially to children because it promotes autopurification of a teeth and massage of parodontium.

The great role in Caries prevention program belongs to hygiene of an oral cavity. According to the literature, regular, controllable cleaning of a teeth 2 times a day during 2 years, reduce morbidity of teeth in 2 times.

The necessary level of hygienic skills and regular care of an oral cavity at children can be provided only at commonwealth of stomatologists, tutors of a day nursery and kindergartens, teachers and parents. The special attention is demanded by
children with anomalies of a bite because density of a teeth contributes to caries-making.

For cleaning a teeth use brushes, pastes, powders, elixirs, solutions for rinsings, toothpicks, dental strings (flosses).

All tooth-pastes to destination can be divided on two groups: hygienic and medical - preventive. Pastes concern to the last "Лесная" and "Хвойная" and also paste "Бальзам". The Tooth-paste "Жемчуг" also is medical - preventive. Due to the maintenance in it of salts of calcium and phosphorus at contact to a surface of a tooth paste renders on enamel mineralizing action, causing receipt in it of ions of calcium and phosphorus. Anticarious action is rendered with pastes “Чебурашка” and “Фтородент”.

Tooth-powders basically possess clearing properties, medical - they do not render preventive action, because introduction in their structure of medical additives is complicated.

Dental elixirs - liquid means of hygiene of an oral cavity. They represent water or spirit solutions containing a various sorts of the additive: vitamins, antiseptics, deodorants.

Hermetic sealing of blind fossas and fissuras on a chewing surface of a teeth are an effective measure under the prevention of caries of a teeth. According to of some authors decrease in a gain of caries on 90 - 95 % is in such way provided. The principle of exception of contact of carbohydrates and microorganisms of an oral cavity with enamel fissuras is put in a basis of this method of Caries prevention program.

The most suitable materials for "smoothing down" fissuras are composite filling materials.

Consider, that hermetic sealing fissuras at use of Evicrol and Consise is effective within 1 years.

It is long since noticed, that at decrease in functions salivary glands, intensity of caries sharply increases in an oral cavity.
Example can be syndrome by Shagren, one of which displays is xerostomia, that is expressed in development of blossoming caries.

For stimulation of function of salivary glands use diet-therapy with the raised contents of hard, sour, spicy food. Some medical grasses possess property of strengthening of salivation. Prepare for broth (1 table spoon of dry grassy raw material on a glass of water) and after 5 minute heatings on a water bath filter. Accept by 1/4 of a glass, 3 times a day during 2 - 3 months. With the same purpose apply a preparation Bromhexin in tablets on 0.004-0.008 1-2 times a day during 2 weeks.

The important action under the prevention of destructive processes in a dental number is sanitation of an oral cavity.

The Founder of stomatologic sanitation is A.K.Limberg who in 90th years of XIX century has proposed two-single survey of children in a year and urgent sealing found out carious teeth.

Elimination of again formed cavities in a teeth warns development in them of complications of caries - pulpitis and a periodontitis which cause formation chronic odontogenic centers influencing current of many pathological processes in an organism.

Allocate three forms of carrying out of sanitation of an oral cavity:
1) Individual or sanitation of an oral cavity on appealability, provides treatment of all diseases of an oral cavity at persons independently addressed in stomatologic establishment;
2) Single or periodic, - full treatment of all diseases of an oral cavity at the limited contingents of the population;
3) Planned (medical - preventive) - regular treatment of stomatologic diseases at the organized groups of the population which are being on dispensary service.

In our country without fail it is spent planned medical-preventive stomatologic sanitation of the organized children's collectives, adult population with chronic diseases and workers of some industrial enterprises.

Distinguish centralized and decentralized methods of sanitation.
At the centralized method surveys and sanitation of an oral cavity are carried out in medical - preventive establishments (regional, city or regional polyclinics). At the decentralized method surveys and sanitation are spent in the medical cabinets created at the enterprises or at schools. In educational establishments (schools, the TECHNICAL TRAINING COLLEGE) with number 800 - 1200 pupils also are more created stationary stomatologic cabinets. Each school is fixed to the certain stomatologist.

There is also a brigade method of service at which in school or on the enterprise the brigade in structure of 2 - 3 doctors, with the sister and nurse and in more terms spends sanitation of an oral cavity.

For rendering the stomatologic help to the population of a countryside and carrying out of sanitation mobile cabinets in specially equipped buses are used. The Special attention should be turned on sanitation of an oral cavity at graduates of schools, pupils of technical training colleges and conscript.

Sanitation of an oral cavity at the persons, suffering chronic diseases, invalids of Great World war and invalids of work is carried out, as a rule, in district clinics. Sanitation of an oral cavity at the working industrial enterprises spend in stomatologic cabinets or the branches created at the enterprise or in district clinics.

Pregnant women are on regular medical check-up in regional and city polyclinics on a residence. The rule of supervision consists that before reception of an exchange card, the woman should be sanified.

Young men - conscripts are sanified by school stomatologists, they consist on regular medical check-up in medical boards of military registration and enlistment offices, it is necessary, that their sanitation has been finished to last commissions.

6. Self-monitoring materials:

A. Tasks for self-control

1. Caries preventive maintenance happens:
   A) Primary, secondary, tertiary;
   B) Endogens;
   C) Exogenes;
   D) The general, local;
   E) Truly all.
2. To elimination actions of cariesogens situations carry:
   A) Correct diet, hygiene of an oral cavity;
   B) Remineralized therapy;
   C) Application of fluoric connections;
   D) Correct tooth bud and development of a tooth tissues;
   E) Truly B, D.

3. Ways of increase of resistance of enamel, it:
   A) Hygiene of an oral cavity, closing of fissures and blind fosses of a teeth;
   B) Correct tooth bud and development of a teeth tissues;
   C) Remineralized therapy, application of fluoric preparations;
   D) Truly A, B;
   E) Truly B, C.

4. Primary preventive maintenance consists in:
   A) Preventive maintenance by fluorine preparations, optimum diet;
   B) Remineralized therapy;
   C) Hermetic sealing of fissures;
   D) Caries treatment modern filling materials;
   E) Rational prosthetics.

5. To secondary preventive actions carry:
   A) Diet change;
   B) Fluoridation of salts and waters;
   C) Early diagnostics and treatment of available defeats;
   D) Treatment available carious defeats, the prevention of the subsequent complications;
   E) Renewal of function paradontium at loss of teeth.

6. To actions of tertiary preventive maintenance carry:
   A) Treatment available carious defeats, rational prosthetics;
   B) Diet change;
   C) Remineralized, hermetic sealing of fissures;
   D) Hygiene of an oral cavity;
   E) Truly all.

7. To the general preventive actions carry:
   A) Fluoridation of salts, training to correct tactics of cleaning of a teeth;
   B) Correct diet;
   C) Hermetic sealing of fissures;
   D) Application fluoride-containing preparations;
   E) Truly all.

8. Actions providing preventive maintenance divide on:
   A) The state;
   B) The social;
   C) The hygienic;
   D) The medical;
   E) Truly all.

9. Schematically all preventive actions divide on:
   A) 2 groups;
10. To endogens not medicamentous preventive maintenance of caries carry:
A) Diets, introduction in a diet of the meal enriched by proteins, amino acids;
B) Hygiene of an oral cavity;
C) Application of preparations of calcium and fluorine, vitamins;
D) Professional hygiene, rational prosthetics;
E) Applications on firm tooth tissues of calcium, fluorine solutions.

7. Recommended literature

**Base:**

**Additional:**

Information resources on the Internet:
- http://dental-ss.org.ua/load/kniga_stomatologiya/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

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<tr>
<td>Topic 22</td>
<td>Non-carious teeth lesions. Classification by Patrikeev. Pathomorphology, clinic and diagnostics of non-carious teeth lesions, which arise before eruption of teeth: hypo-, hyperplasia, endemic fluorosis. anomalies of tooth development. Treatment</td>
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• **Relevance of the topic:** Rather common diseases, that affect the hard tooth tissues, except the caries, are non-caries teeth defects. The treatment of this teeth pathology was mostly ineffective until the last few years and consisted of filling of expressed defects and medication of enamel hyperesthesia.

During the last years a number of researches have been made, that discovered etiology and pathogenesis of different non-caries defects, which occur before dental eruption. These researches made it possible to bring in to the clinical picture a number of treatment modes that affect on the pathogenesis. That’s why, conducting of this pathology is urgent for the future stomatologists.

• **Specific goals:**

  • **To know:**
    - The etiology, pathogenesis, classification and treatment of non-caries teeth defects, which occur before dental eruption.
    - The structure of an enamel.
    - The structure of a dentine.
    - The structure of a periodontium and it’s functions.
    - The etiology of an enamel hypoplasia.
    - The etiology of an enamel hyperplasia.
    - The etiology of endemic fluorosis.
    - The pathogenesis of non-caries teeth defects that affect the hard teeth tissues, which occur before dental eruption.
    - The clinical picture of non-caries teeth defects that affect the hard teeth tissues.

  • **To be able to:**
    - Do the diagnostic of non-caries teeth defects that affect the teeth tissues, which occur before dental eruption.
    - Do the deferential diagnostics of non-caries teeth defects that affect the hard tooth tissue, which occur before dental eruption.
    - Treat men non-caries teeth defects, that occur before dental eruption.

3. **Basic knowledge, experience, skills necessary for studying the topic** (interdisciplinary integration)

<table>
<thead>
<tr>
<th>№</th>
<th>Names of previous disciplines</th>
<th>To know</th>
<th>To be able to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Anatomy</td>
<td>The anatomic features of teeth structure</td>
<td>Determine tooth specified group by specificity of anatomical structure</td>
</tr>
<tr>
<td>2.</td>
<td>Histology</td>
<td>Specificity of histological tooth and periodontium structure</td>
<td>Determine pathological change in teeth and periodontium tissue</td>
</tr>
<tr>
<td>3.</td>
<td>Pathological anatomy</td>
<td>Pathological changes that appear with noncaries defects, which occur before</td>
<td>Define measurement of pathological changes in the</td>
</tr>
</tbody>
</table>
4. Tasks for independent work during preparation for employment and at the lesson

4.1. List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>1. Non-caries teeth defects that affects the hard teeth tissues</td>
<td>Anatomical and functional defects of enamel and dentine that occur as a result of action of an external and internal unfavorable factors on teeth tissues and inadequate resistance of teeth and hole organism</td>
</tr>
<tr>
<td>2. Systematic enamel hypoplasia</td>
<td>Malfunction of texture of hard teeth tissues of all teeth or their separate groups, which are forming at the same length of time</td>
</tr>
<tr>
<td>3. Local hypoplasia</td>
<td>Malfunction of texture of one tooth or two teeth</td>
</tr>
<tr>
<td>4. Dental fluorosis (Endemic dental fluorosis)</td>
<td>Chronic disease, which occur in the area with excessive content of fluorine in the drinking water</td>
</tr>
</tbody>
</table>
4.2 Theoretical questions to the lesson:
1. Non-caries teeth defects that affect hard tissues of teeth, which occur before dental eruption.
2. Classification of non-caries teeth defects by Patrikeyev, Groshikov.
3. Etiology of enamel hypoplasia.
4. Pathomorphological changes of hard teeth tissues during the hypoplasia.
5. Clinical finding of systematic hypoplasia.
6. Hutchinson’s teeth.
7. Fournier’s teeth.
8. Pfluger’s teeth.
9. Clinical finding of local hypoplasia.
11. Treatment of enamel hypoplasia.
13. Dental fluorosis (Endemic dental fluorosis).
15. Classification of dental fluorosis by Muller.
17. Etiology of dental fluorosis.
18. Morphological changes during dental fluorosis.
19. Clinic of dental fluorosis.
20. Differential diagnostics of dental fluorosis,

4.3. Practical work (tasks), which are performed at the lesson
1. Examine the patients with noncaries defects, which occur before dental eruption
2. Examination of patient
3. To palpate the patient’s regional lymph nodes
4. To examine the causative tooth
5. To probe the causative tooth
6. To conduct percussion of causative tooth
7. To conduct intraoral percussion of alveolar process and causative tooth
8. To conduct thermodiagnosis
9. To conduct radiography
10. To conduct electric pulp test of causative tooth
11. To tincture causing tooth with the using of caries detectors

The contents of the topic:
Noncaries teeth defects that affects the hard teeth tissues rates anatomical and functional defects of enamel and dentine that occurs as a result of an action of an external and internal unfavorable factors on teeth tissues and inadequate resistance of teeth and whole organism. Besides, this group contains a number of inherited teeth defects.

Noncaries teeth defects are divided in to 2 groups: by Patrikeyev (1968), Groshikov (1985).

• Teeth defects that affects the hard teeth tissues, which occur in the period of follicular development (before dental eruption):
  • Enamel hypoplasia
  • Enamel hyperplasia
  • Endemic dental fluorosis
  • Inherited malfunctions of development

• Teeth defects that affects the hard teeth tissues, which occur after dental eruption:
  • Teeth pigmentation and dental deposit
  • Dental abrasion
- Wage-shaped defect
- Dental erosion
- Necrosis of hard teeth tissues
- Dental injury
- Hyperesthesia of the tooth

**Enamel hypoplasia.**

**Etiology.** Hypoplasia of tooth tissue (usually enamel) occurs because of metabolic processes in the follicle of tooth under the influence of malfunction of the mineral and albumen metabolism of fetus or child. Hypoplasia is irreversible. Enamel hypoplasia often attended with dentine and pulp disorder. Hypoplasia affects both permanent and temporary teeth.

Hypoplasia of temporary teeth, which are forming during the intrauterine period, caused by the metabolic imbalance of the pregnant (German measles, toxoplasmosis, toxicosis, rhesus incapability). Children that are suffering from chronic somatic diseases, which occur before or soon after their birth, have hypoplasia in 50% cases.

Permanent teeth hypoplasia occurs under the influence of different somatic diseases (rachitis, tetany, acute infectious diseases, gastrointestinal diseases, toxic dyspepsia, nutritional dropsy, cerebral malfunction), which occur during formation and mineralization of these teeth (period from 6 month to 1 - 1.5 year). Hypoplasia localization on the crown of the tooth depends on age, in which the child has a disease. Hypoplasia extent depends on the difficulty of the disease.

The cause of the local hypoplasia as often as not is a trauma of the follicle of the permanent teeth. Defects can occur because of jaw fracture, temporary tooth dislocation, inflammatory processes (periodontitis, periostitis, osteomyelitis). Trauma or intoxication cause malfunction of ameloblast, sometimes odontoblast, there for tooth take the wrong shape and has unusual form.

**Morphological changes.** In case of light forms of hypoplasia (macula) accuracy increasing of enamel structural formation, width and correct direction changes, intraprismal space widening, full-blown Retzius lines are observed. Amount of interglobular dentin is increasing in dentin.

During more harder form of dentin (hollows, fissures) separate enamel prisms have direction about 90°, intraprismal space widening is irregular.

**Clinical picture.** One distinguish a systemic and local hypoplasia.

To a systemic hypoplasia refer violation of a structure of firm fabrics of all teeth or their separate groups which are forming in the same period.

Clinically three forms of a system hypoplasia can be distinguished:

- change of color- weak degree of underdevelopment of enamel, which is shown in the form of spots often white, is rarely yellowish, with a clear boundary and identical size on the groups of teeth with the same name. Spots are more often localized on a vestibular surface and are not accompanied by any unpleasant feelings. Spots at hypoplasia aren't painted by dyes (unlike caries in spot stages).
- underdevelopment of enamels - is more expressed form of a hypoplasia which is shown differently: wavy, dot, furrowed enamel. On a surface of enamel deepenings or grooves are found. Enamel in deepenings remains dense and smooth.
- absence enamels (aplaziya) - the most seldom form. It is characterized by lack of enamel on a certain site of tooth. At this form there can be complaints of painful feelings from thermal and chemical irritants.

One of variety of a systemic hypoplasia are teeth with peculiar changed form of a crown. Such manifestations of violations of a form of a crown of tooth received the names from the names of authors who described them: Getchinson, Fournier, Pflyugera's teeth.

Getchinson's teeth - anomaly of development of tooth at which the top central incisors have a barrel-like form of a crown or a screw-driver form (the size at a neck more than in cutting edges) and semi-lunar cutting at cutting edge. Sometimes semi-lunar dredging isn't enamelled.

Fournier's teeth - the central cutters teeth are similar to Getchinson's teeth, but without semi-lunar dredging.
Pflyuger's teeth - anomaly of the first big molars at which the size of a crown at a tooth neck more than at cutting edge, and chewing hillocks are underdeveloped.

The local hypoplasia is shown by violation of development of firm fabrics of one or two teeth. More often such type of a hypoplasia is observed on constants premolar. This results from the fact that their rudiments take place between roots of temporary house painters which very often are affected by periodontitis. On crowns of such teeth chalked spots which sometimes can color are observed. Defects of enamel in the form of poles, deepenings, furrows are observed. In hard cases of a crown is considerably distorted by sites which are completely deprived of enamel. Such teeth received the name “Turner's teeth”.

Differential diagnostics. The spotty form of a hypoplasia needs to be differentiated with weak manifestations fluorosis of teeth and initial caries.

Treatment. Patients of systemic hypoplasias should be on the dispensary account. Depending on extent of defeat treatment of a hypoplasia can be medicamental, surgical, orthopedic.

Treatment of a spotty form of a hypoplasia should be directed on decolouration of spots on enamel. For this purpose dark stains are processed of saturated solutions of organic acids or 10% solution of hydrochloric acid till pigmentation disappear then tooth are processed by soda paste and are polished. There are many official cure for bleaching of the teeth made on the basis of peroxide carbamide. For effective decolouration it is necessary to carry out 15-20 sessions of treatment. In the absence of effect of spots will be polished with the subsequent covering of these sites fluoric preparations.

Single white spots can be not treated. But if spots are visible at conversation and a smile, it is necessary to eliminate this defect. The main method of treatment is sealing of teeth by composit materials. At the expressed changes orthopedic treatment is shown.

Dental fluorosis (endemic fluorosis teeth) is the chronic disease widespread in districts with the superfluous content of fluorine in drinking water.

At fluorosis enamel of teeth is mainly strickted. Fluorosis is caused by long receipt in an organism of a microcell of fluorine and is shown by on a surface of enamel of forming spots and defects of various size, a form and color. In hard cases skeleton bones are stricked.

Some classifications of fluorosis teeth are offered. V.K. Patrikeev's most widespread classification according to which, fluorosis it is subdivided into the following forms:

• the dashed;
• the spotty;
• the chalked-dotty;
• erosive;
• the destructive.

In foreign countries the classification of World organization of health protection developed by Müller is used. According to this classification allocate 5 severity of a disease, considering not only defeat elements (strips, spots, destruction sites), but also the defeat area.

Classification fluorosis according to Müller:

Degree fluorosis:

The I Art. - very easy: strips or dot white spots, poorly differ from normal color of enamel;

The II Art. - easy: elements of defeat in a type of strips and spots of white color occupy less than 1/4 crowns of tooth;

The III Art. - moderate: strips and spots occupy less than 1/2 surfaces of a crown;

The IV Art. - average weight: mainly brown color of a surface of teeth;

The V Art. - heavy: against brown coloring there are centers of destruction of enamel in the form of poles, erosion, roughnesses.

Classification of a fluorosis by A.K. Nikolishin, on the basis of which lies the definition of fluorescence in UV-rays indexes of omic electrical resistance of rigid tissues of tooth:

• mild degree:- without slaking of primary fluorescence of enamel;
• average degree:- poorly expressed
fragmentary slaking of primary fluorescence of enamel; without the phenomena of a destruction of enamel. Can be:– without enamel coloring;– with fragmentary brown coloring (I, II and III degrees);• heavy degree: - well expressed total slaking of primary fluorescence of enamel. Can be:– without the phenomena of a destruction of enamel (without coloring of enamel or with total coloring);– with the expressed destruction of enamel (without coloring of enamel or with total coloring (I, II and III degrees)).

Etiology. Optimal concentration of fluorine in water considered 1 mg/l. At concentration more than 1,5 mg/l a fluorosis is developing. A fluorosis involves teeth of children who developed fetally, and then resided in the endemic centers of the increased content of fluorine in water, soil, food or lodged there in period of formation of enamel therefore this disease doesn't arise at the adults living in the focus of an endemic fluorosis. Assume that the placenta detains receipt of surpluses of fluorine in the organism of a fetus. The cases of lesion by a fluorosis are rarely observed in teeth which were already cut through in districts with the content of fluorine in water more than 10-15 mg/l.

Morphological changes. Nature of changes in many cases depends on a form of clinical implication of a fluorosis. At a disease in an initial form (shaped and spotty forms) in a subsurface layer of enamel reveal the changed sites of the different sizes and outlines. Gunter-Shreger’s sharply expressed strips and Rettsius's lines. The enamel surface along with smooth contours has separate cambers and hollows. Dentin-enamel connections of a gear form. The surface layer of enamel has moire drawing that is caused by increase in interprismatic spaces owing to a partial resorption of enamel columns, existence of zones hypo - and hyper mineralizations. At microroentgenography in the field of skins of a fluorosis spot decrease in density that points to decrease in a mineralization legibly comes to light. Similar data explain the reason of a pigmentation of enamel existence of sites of enamel with a hyperpermeability. It proves to be true also that on sites of a pigmentation of fluorised teeth a large amount of nitrogen-bearing organic matters is revealed. Under a electron microscope at mild extents of defeat clearness of structures of crystals of a hydroxyapatite is noted, at heavy forms it decreases. The polarizable microscopy allows to establish the most expressed changes in enamel skins. In the field of a fluorosis spot mainly interprismatic space is affected.

Clinic. Fluorosis - system defeat of all teeth. Proceeds asymptomatic. At average and heavier degrees fluorosis the patient is disturbed by "ugly" color of teeth. Fluorosis is shown on teeth soon after their teething in the form of change of color of enamel which loses transparency, becomes opaque, gains yellowish or brown color. These changes of color are observed on crowns of teeth in the form of strips and spots of the various sizes. The quantity and the sizes of the specified elements and their coloring define weight of a disease.

The shaped form fluorosis is characterized by emergence of small chacked strips - the strokes located in a subsurface layer of enamel. Strips can be well seen, but often they are expressed poorly and are shown when drying a surface of tooth. Merge of strips leads to formation of a spot, in which nevertheless appreciable strips. The shaped form is more often observed on a vestibular surface of cutters top, is more rare - the bottom jaw.

The spotty form is characterized by existence of well expressed pretty spots without strips. Chalked of a spot multiple, located on all surfaces of teeth. Sometimes they, merging, form a spot of the big size. The changed site of enamel gradually passes to normal enamel. Cutters of the top and bottom jaws especially often are surprised. Color of a site of defeat sometimes changes - the spot becomes light brown. Feature of this form fluorosis teeth is that enamel in the field of a spot smooth, brilliant.

Chalked-pointed form is characterized by a considerable variety of manifestations. Usually enamel on all surfaces of teeth has an opaque shade, and on this background it is visible well outlined pigmented spots. Sometimes enamel yellowish with existence of multiple spots and points. In certain cases instead of points there are superficial defeats with enamel reduction (diameter of 1,0-1,5 mm and depth of 0,1-0,2 mm). Bottom of their light yellow or dark color. At
a Chalked-pointed form fast deleting of enamel with an exposure of a pigmented dentine of dark brown color is observed.
The erosive form is characterized by that against the expressed pigmentation of enamel there are considerable sites on which it is absent, defects of a different form - erosion are observed. Erosion can have a various form. At an erosive form enamel and dentine deleting is expressed. The destructive form is characterized by change of a form of crowns of teeth owing to destruction and deleting of firm fabrics. This form is observed in areas, in which content of fluorine more than 10 mg/l. Tooth fabrics fragile, their breaking off, however a cavity of tooth is quite often observed doesn't reveal owing to adjournment of a replaceable dentine. Important clinical factor is low defeat of fluorosis teeth by caries. It is necessary to mean that fluorosis teeth is a symptom of intoxication of an organism fluorine which at big doses receipt of a microcell, clinically can be shown also in the form of an osteosclerosis, defeat of kidneys, nervous system. 

**Differential diagnosis.** He should be seen off taking into account a disease form. Easy manifestations fluorosis have a similar clinical picture with a spotty form of a hypoplasia of enamel and with caries in a spot stage. Heavier form fluorosis which are accompanied by formation of erosion and other defects of a crown of tooth, it is necessary to differentiate from a wide range of diseases of a carious and not carious origin (with superficial caries, erosion, a necrosis).

**Treatment.** In spite of the fact that the etiology fluorosis is known, its treatment is impossible, because the illness developed in the period of formation of teeth to their teething. Only symptomatic treatment in the form of bleaching of teeth to patients who complain of cosmetic defect is possible. Some ways of bleaching of teeth are offered:

- the mechanical – a polishing of pigmentation of enamel carbide heads;
- the chemical - application of the concentrated solutions of inorganic and organic acids;
- the physical - UV-rays are used, by laser beams, a direct current.
- the combined. 

Methods of treatment depend on a stage of pathological process. At fluorosis which is accompanied only by changes of color of enamel, the positive effect gives the local treatment which essence consists in bleaching with the subsequent remineralisation therapy. E.V. Bohr (1978) recommends bleaching by solutions of inorganic acids. After tooth isolation from a saliva wadded tampons a surface of tooth dry up and process 20-30 % acid solution (hydrochloric or phosphoric) within 2-3 minutes to an enamel clarification. After that a surface of tooth wash out water and dry up. Then on teeth for 15-20 minutes put 10 % solution of a gluconate of calcium. In the following visit (not earlier than in 1-2 days) procedure repeat, processing acid solution only enamel sites with the changed color. Plan of treatment consists of 10-15 procedures. In treatment it is recommended to accept inside a calcium gluconate, glycerophosphate. As show the clinical supervision, the lasting effect (restoration of natural shine of enamel) remains within 6-8 months. Repeated courses of treatment are necessary for carrying out after emergence of pigmented spots (usually in 6-8 months). Strict observance of rules of personal hygiene, application of toothpastes of remineralized action is recommended.

As a bleaching preparation also use solutions of peroxide of hydrogen in concentration of 6 % and 30 % (perhydrol). Now for this purpose began to use 10 % carbamide peroxide. A preparation in the form of gel place in an individual silicone spoon which impose on teeth of the top or bottom jaw for 30 minutes. Plan of treatment consists of 3-4 procedures.

In recent years in foreign literature widely advertize a microabrasion technique at the heart of which lies polished surfaces of enamel by means of special silicone gel and a carborundum. Polishing surfaces of enamel recommend to combine 6 % of solution of hydrochloric acid with
impact on it. In the presence of a destruction of enamel draw a straight line restoration of the struck teeth with use of modern composite materials of a light hardening.

5. **Self-monitoring materials:**

Tasks for self-control

1. To not carious defeats arising to a teething, on Patrikeev V. K. classification, carry:
   A) Hypoplasia of enamel;
   B) Hyperplasia of enamel;
   C) Fluorosis;
   D) Hereditary infringements of development of a teeth;
   E) Truly all.

2. Fluorosis arises at the use of potable water with the fluorine content:
   A) Less than half optimum (0,35-0,65мг/л);
   B) To the suboptimum;
   C) Optimum (0,7-1,3мг/л);
   D) Above optimum (1,5-2,0мг/л);
   E) In the absence of fluorine in water.

3. The occurrence reasons hypoplasia of enamel of a constant teeth is:
   A) Illnesses of endocrine systems;
   B) Rickets;
   C) Acute infectious diseases;
   D) The heavy form of dyspepsia;
   E) Truly all.

4. System hypoplasia it is shown in a kind:
   A) Wavy enamel;
   B) Dot, cup-shaped deepening;
   C) Aplasia;
   D) In the form of stains of white or yellowish colour;
   E) Truly all.

5. At system hypoplasia an histological it appears:
   A) Increase of interprismatic spaces;
   B) Reduction of a thickness of enamel;
   C) Expansion an Retsius lines;
   D) Zone increase of interglobular spaces;
   E) Truly all.

6. At hypoplasia of enamel are characteristic following complaints:
   A) Hypersensibility;
   B) Erasability of enamel;
   C) Change of colour and the form of a teeth;
   D) Complaints are absent;
   E) Presence of defect in the clinoid form.

7. Typical forms of clinical displays at fluorosis:
   A) Spotted;
   B) Shaped;
   C) Erosive;
   D) Destructive;
   E) Truly all.

8. Hypoplasia of enamel differentiate:
   A) With hyperplasia of enamel;
   B) With clinoid defect;
   C) With caries in a stain of a stage;
D) With middle caries;
E) With chemical necrosis of enamel.
9. The reason of local hypoplasia is:
A) reception of antibiotics of tetracycline number;
B) Chronic mechanical trauma;
C) Mechanical trauma of a constant tooth bud;
D) Rickets;
E) Surplus of fluorine in potable water.
10. To not carious defeats arising after a teething concern:
A) System hypoplasia;
B) Fluorosis;
C) Imperfect amelo- and dentinogenesis;
D) Clinoid defect;
E) Focal demineralization of enamel.

7. Recommended literature

Base:

Additional:

Information resources on the Internet:
- http://dental-ss.org.ua/load/kniga_stomatologiya/terapevticheskaya/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the assistant Lobach L.M.
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

<table>
<thead>
<tr>
<th>Educational discipline</th>
<th>Therapeutic Stomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1:</td>
<td>Methods of inspection of the stomatological patient. Deaseses of tooth hard</td>
</tr>
<tr>
<td>Content module № 2</td>
<td>“Caries and not carious defects of teeth”</td>
</tr>
<tr>
<td>Topic 23</td>
<td>Pathomorphology, clinic and diagnostics of non-carious teeth lesions, which arise after teeth eruption: clinoid defect, enamel erosion, traumatic defeats, chemical defeats, hyperesthesia. Modern desensitizers for treatment of hyperesthesia: kind, composition</td>
</tr>
<tr>
<td>Course</td>
<td>III</td>
</tr>
<tr>
<td>Faculty</td>
<td>Stomatological</td>
</tr>
</tbody>
</table>
1. Relevance of the topic

The topic basis: Besides caries most widespread disease of teeth, there is also other various pathology of firm tissues – not-carious defeats.

Till now treatments of this pathology of teeth in most cases was not effective and, as a rule, consist in sealing the expressed defects and assignment of means for elimination hyperesthesia.

Last years, a number of researches revealing the separate party of etiology and pathogenesis of various not-carious defeats is carried out, that has allowed to enter into clinic a number methods of treatment. Therefore study of them is undoubtedly urgent and represents the large interest during formation of the doctors - stomatologist.

Specific goals

= Will familiarize with etiology, pathogenesis, classification and treatment of notcarious diseases developing after eruption of teeth.

To know:
- Structure of enamel of a tooth;
- Structure of dentin of a tooth;
- Structure and functions of periodontium;
- Etiology of traumatic defeats of teeth;
- Etiology of chemical defeats of teeth;
- Etiology of erosion of enamel;
- Etiology hyperesthesia of firm fabrics of teeth;
- Etiology of clinoid defect of firm tissues of teeth;
- Etiology of pathological dental abrasion;
- Pathogenesis of not-carious defeats of firm tissues of teeth developing after eruption of teeth;
- Clinic of not-carious defeats of firm tissues of teeth;
- Diagnostics of not-carious defeats of firm tissues of teeth;
- Differential diagnostics of not-carious defeats of firm tissues of teeth;
- Treatment of not-carious defeats of firm tissues of teeth.

3. Basic knowledge, experience, skills necessary for studying the topic (interdisciplinary integration)

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<tr>
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<td>pathological changes at notcarious defeats of teeth.</td>
<td>to define volume of operation depending on a defeat.</td>
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4. Tasks for independent work during preparation for employment and at the lesson

4.1. List of basic terms, parameters, characteristics, which should be taken by the student while preparing for the lesson:

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<tr>
<td>1. Tooth dislocation</td>
<td>The displacement of the tooth in the hole occurs when the lateral or vertical direction of the force, that injures</td>
</tr>
<tr>
<td>2. Hyperesthesia</td>
<td>Hypersensitivity of tooth tissues to thermal, chemical and mechanic irritation</td>
</tr>
<tr>
<td>3. Pathological abrasion</td>
<td>Intensive loss of hard tissue in one or several teeth</td>
</tr>
<tr>
<td>4. Desensitizers</td>
<td>Dentin sensitizing agents</td>
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4.2 Theoretical questions to the lesson:

1. Non-caries teeth defects that affect hard tissues of teeth, which occur after dental eruption.
2. Classification of non-caries teeth defects by Patrikeyev, Groshikov.
3. Etiology of enamel erosion.
4. Pathomorphological changes of hard teeth tissues during the erosion.
5. Clinical finding of the erosion.
7. Treatment of enamel erosion.
8. Etiology of clinoid defect.
11. Treatment of clinoid defect.
12. Etiology of acute and chronic tooth injury.
15. Etiology of hyperesthesia.
17. Clinic of hyperesthesia.
18. Differential diagnostics of hyperesthesia,
20. Desensitizers

4.3. Practical work (tasks), which are performed at the lesson
1. Examine the patients with noncaries defects, which occur after dental eruption
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7. To conduct intraoral percussion of alveolar process and causative tooth
8. To conduct thermodiagnosis
9. To conduct radiography
10. To conduct electric pulp test of causative tooth
11. To tincture causing tooth with the using of caries detectors

5. The contents of the topic Traumatic teeth damage

There are acute and chronic injuries.

Acute injuries.
The cause of acute injuries is the injury received at work, in everyday life, while playing sports. Acute injury in 32% of cases causes the loss of front teeth in children. Dislocation of the tooth is most common in baby teeth, then crown fracture, less often crown fracture. In permanent teeth, a part of the crown is found most often, then a dislocation, a tooth contusion and a fracture of the tooth root. Teeth injury occurs in children of different ages, however, baby teeth are more often injured at the age of 1 to 3 years old, and permanent at 8 to 9 years old.

Bruised tooth. In the first hours there is a significant pain, aggravated by biting. Sometimes as a result of a bruise, a rupture of the vascular bundle occurs, there may be pulp hemorrhage. The condition of the pulp is determined by determining its electrical excitability, which is carried out 2-3 days after the injury. To differentiate the bruise of the tooth should be from a root fracture, which may be the same clinical picture, but a fracture of the root of the tooth is clearly determined by the radiograph.
The treatment is to create a rest for the tooth. This is achieved by eliminating solid foods from the diet. In young children, you can turn off a tooth from a contact by grinding the cutting edge of the antagonist tooth crown. Grinding of the edges of the antagonist crown is undesirable. In case of irreversible disturbances in the causal tooth pulp, trepanning of the crown, removal of the dead pulp and canal filling are shown. If there is a darkening of the crown, then before sealing it is bleached.

Dislocated tooth. This is the displacement of the tooth in the hole, which occurs when the traumatic force is lateral or vertical. In a normal periodontal condition, considerable effort is required to move the tooth. However, during bone resorption, dislocation can occur with little effect, for example, when chewing hard foods. Dislocation can be accompanied by damage to the integrity of the gums.
There are dislocations complete, incomplete and impacted. Dislocation can be isolated or in combination with a fracture of the tooth root, alveolar bone or jaw body.

Tooth fracture. It may be broken off of a part or the entire crown and fracture of the tooth root. Break off the crown is not difficult to diagnose. The extent and nature of therapeutic intervention depends on the loss of tissue. When a part of the crown is broken off without opening the cavity of the tooth, it is restored using a composite filling material. Dentin, if necessary, cover with an insulating gasket, and then impose a seal. If during an injury the tooth cavity is opened, then first of all the anesthesia and pulp removal are performed if there are no indications and conditions for its preservation, and the canal is sealed. Fracture of the root can be transverse, longitudinal, oblique, comminuted. The most unfavorable is a longitudinal, comminuted and diagonal oblique fracture, in which the roots cannot be used for support.

In a transverse fracture, much depends on its level. If the transverse fracture occurred at the border of the upper ¼ - 1/3 of the root length or in the middle, then after trepanning the tooth and removing the pulp, the canal is sealed, and the fragments are joined with special pins from the clamp wire. It is important that the pin securely holds the fragments together. In case of a transverse fracture in the quarter of the root nearest to the top, it is enough to seal the canal.

**Chronic injury.** Chronic injury is quite common in everyday practice, and often leads to severe tooth damage. So the formation of patterns on the incisors, the abrasion of hard tissue is the result of long-acting mechanical factors. Chronic injury can be caused by professional factors or bad habits. It consists in the elimination of defects. In these cases, grinding, in others, restoration of the tooth by filling. It is important to eliminate the traumatic factor.

**Acid (chemical) necrosis of the teeth,** is the result of local effects. This damage is usually observed in long-term workers in the production (hydrochloric, nitric) and, more rarely, organic acids. One of the first clinical signs of acid necrosis is a sense of oskomin, increased sensitivity to temperature and chemical stimuli.

The progression of chemical necrosis of hard tooth tissues changes the appearance of the enamel of the teeth of the frontal group: they become dull and rough. Sometimes enamel gets dirty - gray tint or other dark pigmentation. Pronounced erosion of dental tissues.

In acid necrosis, incisors and canines are most severely affected. Enamel disappears in the area of the cutting edges of crowns; Sharp, easily breaking off areas of the tooth crown are formed. Then the process of destruction and erosion extends to the enamel and dentin not only of the vestibular, but also of the lingual surface of the incisors and canines. The crowns of these teeth are shortened, the cutting edge becomes oval, and the crowns take the shape of a wedge. Gradually, the crown of the front teeth is destroyed to the gingival margin, and the group of premolars and molars undergoes a strong abrasion.

**Treatment.** In the event of the occurrence of pathological changes in solid tissues, antidote therapy in the form of soda rinses, rubbing soda pastes, the use of remtherapy, calcium preparations (gluconate and glycerol phosphate) is used. With significant destruction, restoration and orthopedic dentistry is shown.

**Tooth erosion**

The etiology of the disease is not sufficiently identified. Some authors believe that erosion, like a wedge-shaped defect, arises solely from mechanical effects — a toothbrush and
powder. Others believe that it occurs when citrus is consumed in excess. Yu.M. Maksimovsky (1981) plays an important role in the etiology of erosion of hard tissues of teeth by endocrine disruption and, in particular, hyperthyroidism.

Clinical picture. Erosion is an oval enamel defect located in the transverse direction of the most convex part of the vestibular surface of the tooth crown (equator). The bottom of the erosion is smooth, shiny and hard. The gradual deepening and expansion of the boundaries of erosion leads to the loss of the entire enamel of the vestibular tooth surface and part of the dentin.

There are two stages of erosion: initial (erosion of enamel) and severe (erosion of enamel and dentin).

The depth of the lesion is divided into three degrees of erosion:
- I degree or initial - defeat only the surface layers of enamel;
- Grade II or medium - damage to the entire thickness of the enamel to the enamel-dentin border;
- Grade III or deep - a lesion of the enamel and the dentin mantle.

The erosion of enamel in most cases is characterized by pronounced painful sensations under the action of various irritating factors, especially cold air and chemical irritants.

Treatment. In complex dental treatment, calcium and phosphorus preparations should be administered orally, vitamins are useful in combination with microelements. At the stage of stabilization of erosion, 2-3 procedures should be carried out for processing fluorine abrasive paste containing 1.23% fluorine. In the next 2 visits fluorine-gel is applied to the erosion.

In the active stage of the disease, the task is to stabilize the pathological process. This is achieved by additional mineralization by the application method or by electrophoresis using calcium preparations.

Hyperesthesia

Hyperesthesia - increased sensitivity of tooth tissues to mechanical, chemical and temperature stimuli. Most often this phenomenon is observed in the pathology of dental tissues of non-carious origin, as well as in caries and periodontal diseases. In addition to the pain reaction of the teeth resulting from the action of local factors, pain in the teeth can also occur due to certain pathological conditions of the body (systemic or generalized hypertension, the latter is observed in 63–65% of patients with an increased pain response of the teeth).

Clinical picture. Usually, patients complain of acute, transient pain from temperature, chemical or mechanical stimuli. Patients cannot inhale cold air, cannot eat sour, sweet, salty, fruit. Usually, these phenomena are constant, but sometimes remission can be observed. In some cases, there are difficulties in determining the patient's tooth, as pain radiates to adjacent teeth.

Treatment. Hyperesthesia therapy has its own history. The proposal for the use of many drugs in order to eliminate hyperesthesia indicates a lack of their effectiveness. The substances destroying the organic substance of the tooth were used. These include solutions of silver nitrate and zinc chloride. When hyperesthesia of solid tissues were widely used pastes, which include alkalis: sodium bicarbonate, carbonates of sodium, potassium, magnesium, as well as substances that can rebuild the structure of hard tissues of the tooth: sodium fluoride, strontium chloride, calcium preparations and others.
There are many options and methods for treating hypersensitivity, and all of them are selected individually depending on the degree and complexity of the pathology. Ukhanov MM, Selyagnna A.S. Among the desensitizers (products that reduce or eliminate the sensitivity of the dentin) there are several groups. All of them are the means that close the entrances and / or occlude the dentinal tubules.

Classification of desensitizers
I. Resin-containing desensitizers.
   1. Unfilled desensitizers containing HEMA (hydroxyethyl methacrylate):
      a) without glutaraldehyde;
      b) with glutaraldehyde.
   2 Filled desensitizers containing HEMA.
   3 Dentinal adhesive systems.
   Ii. Saline Desensitizers:
      a) with oxalates;
      b) with fluorides;
      c) with strontium;
      d) with calcium and hydroxyapatite;
      e) with potassium;
      e) with citrates;
      g) with tin;
      c) combined.
   iii. Smolosolosuyuschie desensitizer.
   Iv. Other desensitizers

**Clinoid defect**
The name of this pathological condition is due to the shape of the defect in the hard tissues of the tooth (in the form of a wedge). The defect is localized at the necks of the teeth of the upper and lower jaws on the buccal and labial surfaces. Often it appears after the neck of the tooth is exposed, which was the basis for the statement that the wedge-shaped defect is one of the clinical manifestations of periodontal disease. In fact, a direct relationship has not been established, although according to some authors, a wedge-shaped defect in 8-10% of patients is a symptom of some periodontal diseases when the necks of the teeth are exposed. This type of non-caries lesion is most common in people of middle and old age.

Clinical picture. The wedge-shaped defect is usually not accompanied by pain. Sometimes patients only indicate a defect in the tissue at the neck of the tooth. Usually it progresses slowly, and when deepening, the contour does not change and does not occur decay and softening. In rare cases, there is a rapidly passing soreness from temperature, chemical and mechanical stimuli. The sensitivity of the defect depends on the rapidity of the loss of hard tissue.

The defect is formed by the gingival plane, which is located horizontally and the second plane, located at an acute angle. The walls of the defect are dense, shiny, smooth. In cases where the defect comes close to the cavity of the tooth, its contours are visible. A wedge-shaped defect can reach such a depth that, under the influence of a mechanical load, a tooth crown can break off. In most cases, the sensing is painless, but painful sensations can occur at the time of the stimulus.
Treatment. At the initial manifestations of the defect, measures are taken to stabilize the process. To do this, use drugs that increase the resistance of hard tooth tissues (application of 10% calcium gluconate solution, 2% sodium fluoride solution, 75% fluoride paste). In addition, precautions are taken to reduce the mechanical impact on the teeth. If there are pronounced defects in hard tissue, sealing is recommended. Composite filling materials that can seal wedge-shaped defects without preparation are convenient as a filling material. For deep defects, artificial crowns are shown.

Pathological abrasion
The tooth straining occurs in every person, which is the result of the physiological function of chewing. Physiological erasure manifests itself primarily on the mounds of the chewing surfaces of molars and premolars, as well as on the cutting edge of incisors and tearing mounds of canines. In addition, physiological erasure of the tooth surface normally leads to the formation of a small area on the convex part of the crown at the point of contact (point contact) with adjacent teeth.

Clinical picture. Pathological abrasion of hard dental tissues is quite common and is observed in 11.8% of people. Full erasure of chewing hillocks of large and small molars and partial erasability of the cutting edges of the front teeth is more common in men (62.5%), in women this process is much less common (22.7%). Causes of increased erasure can be a state of occlusion, overload due to tooth loss, improper denture design, household and occupational hazards, as well as the formation of defective tissue structures of hard dental tissues.

Often, increased abrasion of teeth occurs in a number of endocrine disorders - impaired function of the thyroid, parathyroid glands, the pituitary gland and is due to a decrease in structural resistance.

Clinical and anatomical classification based on the location and degree of erasure.
I degree - a slight erasure of enamel hillocks and cutting edges of the crowns of the teeth;
Grade II - worn away enamel bumps of canines, premolars and molars and cutting edges of incisors with exposure of the surface layers of dentin.
Grade III - erasing enamel and a significant part of the dentin to the level of the crown cavity of the tooth.

Treatment. The degree of erasure of hard dental tissue largely determines the treatment. So, with I and II degree of erasure, the main task of treatment is to stabilize the process, prevent further progression of erasure. To this end, antagonists on teeth, mostly large molars, can be made into tabs (preferably from alloys) that cannot be abraded for a long time.

Often, the erasure of tooth tissues is accompanied by hyperesthesia, which requires appropriate treatment. Significant difficulties arise in the treatment of III degree of erasure, accompanied by a pronounced decrease in the height of the bite. In such cases, the former height of the bite is restored by fixed prostheses.

6. Self-monitoring materials:
Tasks for self-control
1. Defeats of a teeth which arise after teething on V.K.Patrikeva's classification concern:
A) Pigmentation of a teeth and dental deposit;
B) Erasing of firm tissues;
C) Clinoid defect;
D) Trauma of a teeth;
E) Truly all.

2. Partial or full displacement of a tooth from alveole towards a jaw body is:
A) Impacted dislocation;
B) Full dislocation;
C) Incomplete dislocation;
D) Root fracture;
E) Crown fracture.

3. Optimum for preservation of a tooth root fracture:
A) The longitudinal;
B) Plait;
C) Cross-section (in the field of the top third of root)
D) Cross-section (in the field of the root middle)
E) The splintered.

4. Defeat which develops under the influence of some not microbial factors, is characterized by destruction of a tooth tissues, it:
A) Necrosis of firm tissues;
B) Caries of teeth;
C) Hypoplasia;
D) Hyperplasia;
E) Fournier’s teeth.

5. At the general treatment of beam necrosis use:
A) Antioxidants, calcium preparations;
B) Hormonal preparations;
C) Anesthetic;
D) Antibiotics;
E) Truly all.

6. At acid necrosis are most hard amazed:
A) The top jaw molars;
B) The bottom jaw molars;
C) Incisors and canines;
D) The top jaw premolars;
E) The bottom jaw premolars.

7. Differential differences of initial degree acid necrosis of enamel from syndrome Stentona-Kapdepona:
A) Partial or full absence of enamel of teeth, pigmented dentine;
B) Smoothing of a teeth form, presence of hyperesthesia, a matte surface of enamel, sensation of teeth «sticking»;
C) Considerable sites of a teeth without enamel, the sharp edges of enamel injuring a mucous membrane of lips, cheeks, tongue;
D) Colour of a teeth from nacreous to brown, presence of hyperesthesia, all teeth is amazed;
E) Teeth has the cylindrical form, matte.
8. For local treatment of hyperesthesia of firm tissues use:
   A) Solutions of nitrate of silver and zinc chloride;
   B) Solutions of valerians;
   C) Solutions of methylene dark blue;
   D) Solutions of peroxide of hydrogen;
   E) Solution of ethyl spirit.

9. For local treatment of hyperesthesia of firm tissues use:
   A) 1 % solution of sodium fluoride;
   B) 2-5 % solution of dicaine;
   C) Aquaprep F firm BISCO;
   D) Gluma Desensitaizer firm Heraeus Kulzer;
   E) Truly all.

10. Into structure of modern desensitizers enters:
    A) Nanofiller on a basis of ormoocere, fluoride, triclozane;
    B) Hydroxyethylmetacrylate, glytaraldehyde, distilled water;
    C) Ortophosphoric acid;
    D) Maleine acid;
    E) Truly A, B.

7. Recommended literature

   **Base:**

   **Additional:**

Information resources on the Internet:
- http://dental-ss.org.ua/load/kniga_stomatologia/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html

The methodical reference is made by the assistant Lobach L.M.