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>Module 1: Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td>Content module № 1</td>
<td>“Inspection of the stomatological patient with odontopathy”.</td>
</tr>
<tr>
<td><strong>Topic 1</strong></td>
<td><strong>Organization of the stomatological help on Ukraine. Frame of stomatological polyclinics and its therapeutic branch. Tasks of a therapeutic stomatology, interrelation with general clinical and stomatological disciplines.</strong></td>
</tr>
</tbody>
</table>

| Course | III |
| Faculty | Stomatological |
1. **Relevance of the topic:** this topic is very important for future doctors in their professional activities, positively affects the students on their attitude to the future profession, forms an understanding of the subject and objectives of therapeutic dentistry, its link with general clinical and dental disciplines. The student's transition from the phantom classes to the clinic of therapeutic dentistry requires knowledge of its structure, the main and additional departments, the appointment of individual offices.

2. **Specific goals:**
   - To familiarize with frame and mode of operations of stomatological polyclinic, specialized consulting rooms of therapeutic branch.
   - To analyze the stages of a becoming of faculty of a propedeutics of a therapeutic stomatology, its employees;
   - To know:
     1. History of the development of dentistry, in particular in Ukraine
     2. Name of faculty, history of its becoming;
     3. Tasks and sections of a therapeutic stomatology;
     4. Frame of stomatological service of Ukraine;
     5. Frame and tasks of stomatological polyclinic;
     6. Purpose of the specialized consulting rooms of therapeutic branch;
     7. The specifications and demands to organization of stomatological consulting room.

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>History of medicine</td>
<td>stages of a becoming of a domestic stomatology, ethical and deontological principles of job.</td>
<td>use deontological principles and ethical norms at realization of stomatological reception</td>
</tr>
<tr>
<td>Psychology</td>
<td>psychological problems, which arise at the patient during realization of stomato-</td>
<td>use the psychological approach at reception of the stomatological patient</td>
</tr>
</tbody>
</table>
Biophysics | tological manipulations
---|---
features of job of electrode-vices, safety precautions | use the safety precautions at job with stomatological installations, electrode-vices

Internal illnesses | disease of internal bodies, which have displays in oral cavity | define interrelation between diseases of internal bodies and their displays in oral cavity. To spend adequate treatment and prophylaxis.

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><strong>Stomatology</strong></td>
<td>(from Greek: the stoma-mouth, logos-doctrine) - medical discipline, which is engaged in study of an etiology and pathogeny of diseases of teeth, jaws and other bodies of an oral cavity, their diagnostics, treatment and prophylaxis.</td>
</tr>
<tr>
<td><strong>Sections of Stomatology</strong></td>
<td>1. Therapeutic stomatology; 2. Surgical stomatology; 3. Orthopaedic stomatology; 4. Stomatology of children's age</td>
</tr>
<tr>
<td><strong>Section of therapeutic stomatology:</strong></td>
<td>1. Phantom course; 2. Odontopathology, included endodontology; 3. Parodontology; 4. Illnesses of a mucosa of an oral cavity.</td>
</tr>
<tr>
<td><strong>Purpose and objectives of therapeutic stomatology:</strong></td>
<td>Therapeutic stomatology includes study and diagnostics of illnesses of teeth, periodontal tissues and mucosa of an oral cavity, development of methods of their treatment directed on conservation of frame and function.</td>
</tr>
</tbody>
</table>
4.2. Theoretical questions to the lesson:
1. Definition of a therapeutic stomatology as sciences
2. List general clinical and stomatological discipline, which have close connection with a therapeutic stomatology.
3. Frame of stomatological service of Ukraine
4. Frame of stomatological polyclinic.
5. Function of stomatological polyclinic.
6. Frame of therapeutic branch, function of separate medical consulting rooms.
7. Specifications and demands to organization of stomatological consulting room.

4.3. Practical work (tasks), which are performed at the lesson:
1. Schematically depict the organization of dental care in Ukraine;
2. To get acquainted with the structure of the dental clinic, its main and additional departments;
3. To get acquainted with the work of the therapeutic department of the dental clinic

5. The contents of the topic:

   Stomatology – (from Greek: the stoma-mouth, logos-doctrine) - medical discipline, which is engaged in study of an etiology and pathogeny of diseases of teeth, jaws and other bodies of an oral cavity, their diagnostics, treatment and prophylaxis.

Stomatology is sectioned on:
1. Therapeutic stomatology;
2. Surgical stomatology;
3. Orthopaedic stomatology;

   Therapeutic stomatology

   The following section enter into a therapeutic stomatology:

✓ Phantom course;
✓ Odontopathology, included endodontology;
✓ Parodontology;
✓ Illnesses of a mucosa of an oral cavity.
Therapeutic stomatology includes study and diagnostics of illnesses of teeth, periodontal tissues and mucosa of an oral cavity, development of methods of their treatment directed on conservation of frame and function.

The therapeutic stomatology is fundamental discipline, as the diseases, which are studied by a therapeutic stomatology, wide-spread among the population of globe:

- Illness of teeth - the caries - now affects 90 % of the population of globe;
- The illness of parodontium -parodontitis- affects with 85 % of the population of globe on the data a WHO and 95 % persons of elderly and senile age;
- The diseases of a mucosa of an oral cavity affects 20 % of people and in 80 % from this number - as displays of general diseases of an organism.
- Often there are not carious defeats, which parentage depends on geographical features and professional harmfulness;

According to the international classification 17 classes of diseases are totaled, 12 of them are characterized by displays on a mucosa of an oral cavity.

History of stomatology. In XIX centure the therapeutic stomatology has received appreciable development. Were entered:

1820 - the burs into practice;
1836 - an arsenious acid for devitalization;
1870 - a foot drill was thought up by the American Morrison.
1886 Black has developed the classical doctrine about preparation of carious cavities.
1829 - the women have received the right to study teeth-doctoring.

Till 1880 barbers were engaged in teeth-doctoring, which also wore a rank of tooth doctor, and since 1838 tooth doctors began to name by the dentists.

In 1880 A.V. Sklifosovskiy marked, that teeth-doctoring is major area of surgery, but it is not developed yet. He studied prevalence of a caries by inspection of the population and has revealed, that 80 % of the surveyed people suffer from this disease.

In 1881 in St. Petersburg the first dental surgery school in Russia opens. A.V. Sklifosovskiy begins to invite the surgeons in area of teeth-doctoring. After 1900 the
dental surgery schools in Moscow, Kharkov, Kiev, Odessa etc. were open, and to 1917 it was more than 20 schools.

1921 - odontological faculty opens at the Kharkov medical academy. E.M. Gofung was the organizer of the faculty. From the date of the basis he was the dean of the chair and professor;

1937 - the chair was transformed in Kharkov State medical stomatological institute;

1967 – it was moved (transferred) in Poltava. Till 1971 in structure of institute was only stomatological faculty. In 1971 the medical faculty was open.

Professor E.M. Gofung was the first manager of the chair, then chair was headed by the senior lecturer Fridman Y.L., then by professor Begelman L.A. Since 1962 the chair was headed by professor Maksimenko P.T.

1989 - the chair was divided into 2 chairs: the chair of a propedeutics of a therapeutic stomatology, which was headed by the professor Kovalev E.V., and chair of a hospital therapeutic stomatology, which the professor Nikolisliin A.K. was headed (now the chair is headed by professor Petrushanko T.A.).

The chair of a propedeutics of a therapeutic stomatology is posed on base 4th municipal hospitals of 2nd polyclinic branch. Consists of studies head of faculties, senior lecturers, assistant room, clinical halls (601,711), educational rooms of self-preparation of the students (№1, №2, №3).

Since 1989 to 2014 the Head of chair was the professor Kovalev E.V. After the ending of Kharkov medical stomatological institute he has remained on chair of anatomy of the man as the assistant. Has protected the candidate dissertation on a theme "The structural analysis of ways of microcirculation of a pulp of teeth of the man in norm and at parodontitis".

Currently, the department is headed by D.M. Tkachenko Irina Michaylovna.

1995 - the stomatological institute of Poltava was renamed in UMSA.

Now there are 7 senior lecturers, 5 assistants work on the chair. On chair there is a scientific circle, in which the students are engaged.
5. Self-monitoring materials:

A. Tasks for self-control

1. On September, 30th 1921 was organised odontological faculty as a part of the Kharkov medical academy. Chair conservative teeth treatment with a propaedeutics course has headed:
   A) A.I. Rybackov;
   B) I.G. Lukomsky;
   C) M.V. Sklifosovsky;
   D) J.M. Gofung;
2. The basic structural divisions of a stomatologic polyclinic is:
   A) Registry;
   B) Therapeutic department;
   C) Radiological department;
   D) Physiotherapeutic department;
   E) Dentaltehnicy laboratory.
3. Who was the first head of chair a propedeutic of therapeutic stomatology in UMSA:
   A) Prof. Gofung J.M.;
   B) Prof. Nikolishin A.K.;
   C) Prof. Borisenko A.V.;
   D) Prof. Kovalev E.V.;
   E) Prof. Danilevskij N.F.
4. Who was the first head of chair of therapeutic stomatology in PMSI:
   A) Prof. Kovalev E.V.;
   B) Prof. Maksimenko P. T;
   C) Prof. Gofung J.M.;
   D) Prof. Nikolishin A.K.;
   E) Prof. Danilevskij N.F.
5. How many stomatologic faculties at medical institutes nowadays function:
   A) 5;
   B) 12;
   C) 15;
   D) 18;
   E) 20.
6. I Ukraine dentist congress has taken place in Odessa in:
   A) 1921;
   B) 1932;
   C) 1941;
   D) 1975;
   E) 1978
7. Who is the author of the first textbook «Therapeutic stomatology»:
   A) A.K.Nikolishin;
   B) I.J.Novik;
   C) N.F.Danilevsky, A.V.Borisenko;
   D) M.A.Kodola, V.O.Nikitin.
   E) J.M.Gofung, I.G.Lukomsky, D.A.Entin;
8. Who on VI congress of scientists (1879) had been offered for the first time the project of preparation of dentists on medical chairs of universities:
   A) M.I.Pirogov;
   B) M.V.Sklifosovskiy;
   C) J.M.Gofung;
   D) I.J.Novik;
   E) I.G.Lukomskiy.
9. In what year the Kharkov medical stomatologic institute has been transferred to Poltava:
A) 1925;
B) 1937;
C) 1957;
D) 1967;
E) 1980.

10. When was created a chair of propedeutic of therapeutic stomatology at UMSA:
A) In 1969;
B) In 1979;
C) In 1989;
D) In 1999;
E) In 2010

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.mosidental.ru/Pages/Page28.1.html

The methodical reference is made by the docent Marchenko I.Ya.
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>Module 1: Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td>Content module № 1</td>
<td>“Inspection of the stomatological patient with odontopathy”.</td>
</tr>
<tr>
<td><strong>Topic 2</strong></td>
<td><strong>Equipment of workplaces of the doctor-stomatologists; universal installations and dental surgery armchairs. The safety precautions. Ethics and deontology of the student-stomatologists. Iatrogenic diseases. Urgent states in the dental reception: causes, clinical manifestations, Doctor’s help (independent work).</strong></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:** Work at the clinic of therapeutic dentistry requires the student the ability to organize their workplace, configure dental equipment, dental universal installation, chairs, choose tools, dental tips (handpieces), burs for patient examination and carrying out procedures. In addition, the student must know and follow to ethical behavior and deontologic approach to patients.

2. **Specific goals:**
   - To familiarize with workplace of the doctor - stomatologist.
   - To know:
     1. The specifications and demands to organization of stomatological consulting room;
     2. Kinds of stomatological installations;
     3. The safety precautions at job on stomatological installations, with strong medicines, with fine endodontical toolkit.
   - To be able:
     1. To use modern stomatological installations;
     2. To use rules of safety at job with electrical devices, installations, medicines, fine toolkit;
     3. To apply of ethical norms and deontological rules at dialogue with the patients, younger medical personnel, between itself.

3. **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>1. Propedeutics of preventive dentistry</td>
<td>To know dental equipment and apparatus. To be able to determine the serviceability of dental equipment.</td>
</tr>
<tr>
<td>2. Anatomy</td>
<td>To know the topography of the major anatomical structures in the head and neck.</td>
</tr>
<tr>
<td>3. Physiopathology</td>
<td>To understand the etiology and pathogenesis of allergic reactions. Distinguish between their types.</td>
</tr>
<tr>
<td>4. Pharmacology</td>
<td>To be aware of drugs for emergency treatment, their dosage, route of administration. To understand</td>
</tr>
</tbody>
</table>
the mechanism of their action.

5. Biophysics
To know the features of the electrical devices operations and safety engineering when using them.

6. Internal diseases
To identify the clinical picture of the main hospital emergency conditions and know the first aid algorithm.

7. Medical psychology
To distinguish between psychological personality types of dental patients. To understand the patients’ psychological problems occurring during dental procedures. To know the basic principles of the medical ethics.

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>Ergonomics</td>
<td>(from the Greek words <em>ergon</em> meaning <em>work</em> and <em>nomos</em> meaning <em>law</em>). Ergonomics is a science that studies the human functional capabilities during labor processes to create optimal working conditions.</td>
</tr>
<tr>
<td>Deontology</td>
<td>comes from the Greek: Deon – debt, logos – science. The doctrine about debt or doctrine about proper</td>
</tr>
<tr>
<td>Medical deontology</td>
<td>Set of ethical standards and principles of behavior of medical staff at performance of their professional duties. It is include:</td>
</tr>
<tr>
<td>Iatrogenic diseases</td>
<td>are diseases resulting from doctors or medical personnel professional mistakes or negligent attitude (relation) to the patient.</td>
</tr>
</tbody>
</table>
4.2. Theoretical questions to the lesson:
1. Sanitary and hygienic requirements for the work arrangement of dental office
2. Demand to equipment of a workplace of the doctor - stomatologist;
4. Rules of ethical and deontological behaviour of the students in a clinical hall.
5. Safety requirements before starting work.
6. 3. Safety requirements during operation.
7. 4. Safety requirements after operation.
8. 5. Safety requirements during emergency situations.
9. Definition of "loss of consciousness", the clinical picture and algorithm for emergency assistance.
10. The definition of "anaphylactic shock", the clinical picture and algorithm for emergency assistance.
11. The definition of "angioedema", clinical picture and algorithm for emergency care.
12. Definition of “high blood pressure", " hypertensive crisis", the clinical picture and algorithm for emergency care.
13. The definition of "collapse", clinical picture and algorithm for emergency care.
14. The definition of "bleeding", the clinical picture and algorithm for emergency assistance.

4.3. Practical work (tasks), which are performed at the lesson:
1. Listen instruction manual on safety engineering work in the clinic, fill out the notebook for work safety.
2. Prepare to work a dental unit, a dental chair.
3. To form the necessary set of tools for patient examination and treatment.
4. Install turbine tip (handpiece), micromotor;
5. Fix the burs in the handpieces;
6. Use ethical and deontological rules when working in a dentist's office.
7. Provide emergency care to the patient with urgent state (to the student at situation-al game) using the necessary medicines.
5. The contents of the topic:

**Sanitary and hygienic requirements for the work arrangement of dental office**

Modern technical equipment and its rational arrangement at the dental office are a matter of great concern for the efficient dentist’s functioning; it allows to meet challenges of diagnostics and treatment of periodontal diseases, oral mucosa and hard tissues. Location of premises, their area, equipment, lighting, ventilation, water supply and sanitation improvement must comply with the requirements of State Building Code V.2.2.-10-2001 "Buildings and constructions. Healthcare facilities". The Ministry of Public Health of Ukraine must approve all the interior materials for the constructing.

According to existing regulations, the area of the dental office per a doctor must be not less than 14 m². If there are some dental chairs at the office the room surface area is calculated by adding 7 m² per each successive chair. If there is a universal dental engine for the additional chair, the room area is calculated by adding 10 m².

The dental chair should be located close to the window and opposite it to ensure natural lighting of the patient’s oral cavity and access for fresh air. When there are two or more workplaces, the protective barriers between the seats should be provided. The walls height should be at least 3 m to ensure a minimum of 12 m³ of air per person, and the depth of chairs placement at one-sided natural lighting should not exceed 6 m.

It is important to maintain a comfortable temperature at the dental office, it should be 18-23° C in cold weather and 21-25° C in warm weather; relative humidity - 40-60%; air velocity should not exceed 0.2 m/s.

The walls and the floor of the dental office should be painted in light colors with reflectance not lower than 40. It is advisable to use a neutral light gray color as it promotes to differentiate the shades of oral mucosa, skin, teeth (natural and artificial) as well as the filling materials. All doors and windows should be treated with white oil-based paint. Doors and window fittings have to be smooth for easier cleaning.

Dentist’s functioning requires constant eyestrain during all stages of patient’s examination, in the process of instruments selection and treatment as well as paper work. Thus the lighting in the dental office should be sufficient (to provide proper efficiency of the visual analyzer) and within the adequate visible light spectrum limits (to allow adequate color), proportional (to prevent harmful excess eye adjustment occurring while transferring the sight from the highlight surfaces to dark and vice versa) and should not heat the operating area.

The office should be illuminated with natural, general and local artificial lighting. The lighting ratio (a quantitative measure of the difference between the windows glass surfaces and floor area) should be 1:4-1:5; daylight factor - DF = not less than 1.5%; the angle of incidence of light rays should be not less than 28°. It is recommended to face dental offices windows to the north or fit them with blinds to avoid direct sunlight (as it leads to sudden changes in brightness) and to prevent room overheating.
The office should be illuminated with general artificial lighting, i.e. fluorescent lamps or incandescent lamp. In this case, the office illumination level should not be less than 500 lux. In addition to general lighting, the office should be locally illuminated by the reflector on the dental units.

The quantitative index of illumination uniformity required for the hygienic assessment of artificial lighting is the ratio of its highest level to the lowest one. There are three areas to determine the illumination level:

- operating area (oral cavity);
- transitional area (chin);
- general lighting area (room illumination).

The correlation of the transitional area with the operating area should be 3:1. The correlation of the general lighting area with the operating area should be 10:1 to avoid light disadaptation that is harmful for the doctor’s sight while shifting the focus from highly illuminated surfaces. The local and general lighting fittings should have the appropriate protective accessories to shield personnel’s vision organs from the lamps dazzling.

The surfaces of walls, partitions and ceiling of the premises for medical and technological process should be smooth to assure wet cleaning and disinfection.

Dental offices are provided with combined extract and input ventilation with mechanical drive (or combined natural extract and mechanical input ventilation) to provide air and heat balance of the premises. It is necessary to maintain a constant fresh air circulation to reduce microbial contamination in the dental office. The constant flow of fresh air significantly reduces the number of pathogenic microorganisms. It is essential to provide triple air exchange within one hour by natural or input ventilation system. Natural ventilation provides such exchange with the room volume not less than 12 m³ per a person, so the minimum volume of dental office is about 36 m³ per one doctor’s workplace. Short breaks between patients attendance are necessary for room ventilation as well as prolonged airing before and after work. At the same time, the room is treated with bactericidal lamps.

When necessary the room is equipped with air-conditioners to provide adequate microclimate (humidity, air temperature of operating area). Quartz lamp (wall-mounted or portable) is necessary for the UV sterilization between shifts or after the working hours.

The walls of the dental office where operations with amalgam are performed should be smooth, without cracks and splits. The walls and ceilings are plastered (brick-built) or floated (bearing-walls) with the addition of 5% solution of powdered sulfur for sorbing mercury steam binding to form stable compound (sulfuric mercury) which is not subject to desorption; the walls and ceilings are treated with water-based or oil paints. The floor is cemented, covered with the wood chipboard, and then the rolled linoleum, which must be solid and go 5-10 cm up to the wall; there should be interior skirtings (under the linoleum). The fume hood is the compulsory condition if the amalgam is used.

Composite materials using also requires special conditions in the dental office. There are rather high requirements for temperature control in the dental office. The most optimal operating characteristics of composite materials are performed
within the temperature range 21-24° C. At a temperature 21°C the composite loses its plasticity and ability to join in layers via oxygen inhibited superficial layer. The temperature above 24° C increases the temperature of a filling material and complicates its plastic processing leading to the failure of polymerized layer formation with further development of cracks and pigments penetration, which significantly affects the restoration quality.

Complex technology of light curing composite materials requires keeping the precise time for manipulations performing. It is convenient to use the wall clock for visual control of time consumed and it should be located within view of the doctor and the assistant as well.

Modern composite resin fillings materials are very sensitive to light, their polymerization can be caused by even by a lamp of dental unit, thus it is desirable to use special shadowless reflectors with diffused light that do not heat the operating area.

Polymerization of light cure resin based composites can occur under the UV light exposure that is very harmful for the vision organs of medical staff and patients as well. The utilization of special protective devices will be more effective if the dental office walls are covered with materials that meet sanitary requirements as well as minimally reflect the light of the polymerization lamp. For the adequate color perception, the dentist should unload the vision by looking for 3-4 min at the landscape paintings of green shades on the walls of the office (S.V. Radlinsky, 1995).

**The term "ergonomics"** (from the Greek words *ergon* meaning work and *nomos* meaning law) was firstly proposed by the Polish scientist Wojciech Jastrzębowski in 1857. Ergonomics is a science that studies the human functional capabilities during labor processes to create optimal working conditions. The task of ergonomics is to maximize dentist’s productivity on the one hand and to provide comfortable and safety conditions, energy and health maintenance as well as physical ability on the other hand.

There should not be too much things at the operating room and equipment and furniture should make the most efficient use.

Efficient facilities arrangement at the dental office, the adequate equipment placement and doctor’s physical strain reduction are the main conditions to organize the proper work of a dentist and medical staff, i.e. to ensure doctor’s correct ergonomic posture, to avoid unnecessary inefficient motions and manipulations as well as staff moving throughout the room. Anthropometric data of the personnel should also be considered while arranging and adjusting the equipment.

Depending on the character of the medical intervention, the dentist can work in the sitting or standing positions treating the patient in a lying, reclining or sitting positions. The dental therapist is considered to work efficiently in a sitting position for 60% of the working hours. According to ergonomics bases, the sitting position is the most effective way to perform prolonged manipulations that require precise, accurate movements in case of proper access. Standing position is suitable only for short operations accompanied by powerful physical effort and complicated access. The patient’s oral cavity should be positioned at the operator’s shoulder height when treat-
ing the maxillary area and it should be at the elbow height when treating the mandibu-
lar one.

Nowadays the “four-handed dentistry” is believed to meet the requirements of ergonomics when treating the patient in horizontal position (Figure 2.1). In addition to saving time, such work organization gives the doctor a number of technological advantages. The modern dental practice is almost impossible without dental assistant, as there is a number of specific work practices involving assistance participation (conservative preparation with water-cooling spray, the use of saliva ejector and vacuum cleaner, infection control, keeping the technologies for light curing composite materials, operations with gutta-percha).

The practice of “four-handed dentistry” requires the patient to be in a lying position. When the treatment involves the mandibular posterior teeth, the seat back angle is 20-25°. When the treatment involves the teeth of the upper jaw or frontal man-
dibular teeth the seat back angle should not exceed 5-10°, and sometimes the patient is positioned horizontally (the patient’s nose and knees are at approximately the same level).

The dental office should be equipped with workstations for a doctor, a nurse and attendants. The doctor’s workplace includes dental unit, the armchair, the instru-
ment table, the screw chair and the desk for paperwork.

A multipurpose dental unit is a system of dental power tools that are designed to provide dental care during patient’s examination. Dental unit consists of some modules.

- **Dental chair.** Manufacturers are trying to design units according to ergo-
nomics principle. The chair consists of a seat, which is usually prolonged to provide space for patient’s feet, a backrest, a headrest, armrests (they can often be omitted in modern units). All chair parts are in movable connection to create comfortable conditions for both the operator and the patient during treatment. Anatomically shaped dental chair is equipped with synchronous movement of a seat and a backrest to place patient into the lying position without "stretching effect". The patient’s head perfectly fits a headrest due to its anatomical configuration and is easily moved to operate maxillary and mandibular areas on. Free legs position of the dentist and the assistant is provided due to the upper part displacement relative to the seat base. The dental chair has a finger-or-foot-operated control system located at the chair base, the back and footboard. Dental chairs are provided with a scissors-type lift device, to ensure increased rigidity and makes the chair reliable and convenient.

- **Operating light unit.** It consists of a halogen lamp (or LED) reflector, light adjusting arms; it is sometimes equipped with a fan for cooling and is attached with the bracket. The modern units are supplied with operating light of several power lev-
els to illuminate the operating area.

- **Instrument tray.** It includes the drilling engine and water and air gun sy-
ringes (chip-blower). Modern units are supplied with electric drilling engines- mi-
cromotors (rotary speed is 10 000-30 000 rev/ min) and turbine drills (rotary speed is 300 000-500 000 rev/min).
• Dental delivery unit (includes auxiliary table and tools holder) is the main part of the dental unit and defines the doctor’s functioning. The most common three options for fixing tools are fixed (with upper and lower tools delivery) and mobile. The routine therapeutic operations require the minimum toolkit (the presence of three dental hosepipes needed for air syringe, micromotor and turbine). Further unit equipping with dental instruments depends on the type of installation, the doctor’s desire as well as the variety of therapeutic measures and financial capabilities.

Dental delivery unit has accessory specifications including dentist’s control of the unit itself and the patient’s chair as well as the possibility to install any equipment necessary. It is possible to install the following extra equipment:
- air or ultrasonic scaler;
- extra micromotor or turbine;
- endodontic motor;
- electric diatermocoagulator;
- light cure lamp;
- electromechanical device for odontodiagnosis;
- intraoral camera etc.

• Assistant’s unit consists of two interrelated elements: hydroblock (a ceramic bowl with quick-release autoclavable cup filler and bowl rinse spouts) and vacuum evacuation unit. The assistant’s unit can also be equipped with supplementary optional control system and various auxiliary tools. Typically, the tools and assistant’s control system are mounted on a separate movable arm.

• Aspiration system. It is usually located to the left of the chair and consists of several hoses (saliva ejectors, vacuum cleaner) to evacuate saliva, water and dust through the filters system into the sewer. It also includes spittoon bowl and watersyringe. Aspiration system consists of three main components: the suction unit, the vacuum generator and the separator.
  - Suction unit is a dental assistant’s working area and is supplied with virtually all modern dental units. Besides saliva ejectors there may be various control systems. It is usually located behind the spittoon block on the mobile console. Practicing the “four-handed dentistry”, the assistant monitors the correct position of suction tips within the patient’s mouth. There are also offline aspiration blocks that are not included into the dental unit.
  - Vacuum generators vary according to the functioning principle: a) air-operated vacuum generators where the vacuum is created by the airflow that is passed through a small hole under high pressure. It is used in individual suction units in low-cost dental units; b) dry-vacuum pump where vacuum is created by a fan, which is driven by a powerful electric motor and is widely used both in individual and centralized suction systems; c) water-pump vacuum where the vacuum is created by the water flow formed by a water turbine powered by an electric motor; it used only in centralized suction systems.
  - The separator is designed to separate liquids and particles from the air to prevent them from getting into the air-operated vacuum generator or air vacuum pump. Separated liquid and particles flow into the drainage (sewer) pipe. The separator can be located in the spittoon block, in the aspiration block or outside the unit.
Dental drills are classified into four types according to the driving mechanisms.

1. Air turbine dental drill. The principle of air turbine dental drill is that a foot-controlled flow of compressed air is carried via a flexible hose. Compressor is usually installed in a separate room to diminish its noise. Compressor can operate for some dental units. Air turbine dental drill can function with removable turbine handpieces of varying thickness and length and provides a very accurate processing by high speed tool rotation (100 000-500 000 rev/min) as well as rapid and efficient preparation of hard tooth tissues, especially enamel. The first air turbine was founded in 1959.

2. Electrical and mechanical drill - micromotor. It has greater torque, or turning power, with rotation speed of 500-40 000 rev/min. It is used for dentine preparing, root canal mechanic processing, final (finishing) processing of fillings. The first electric drill was introduced in 1926.

3. Electromechanical gear driven drill (hard hose) is out of date. It has low speed and high vibration. This type of drill was widely used in dentistry of the former USSR. Since the mid-2000s, such drills are hardly used and extremely rare in working condition.

4. Laser drill functions due to light radiation without rotational motor. Laser drill control is performed by using RZ buttons. This type of drills allows to perform patient’s treatment more efficiently without painful sensations. The treatment lasts for seconds, sometimes for minutes, and then a cure lighting filling is inserted (chemical filling is incompatible with the laser drill treatment). This type of drill was used in the early 2010s and soon laser drills obviously can completely replace rotating drills. The advantages of laser drills is the absence of painful sensations while the dentist’s efficiency significantly increases.

In the auxiliary office area there should be a table for paperwork, some chairs, sinks for hands and tools washing, a table with a set of sterile instruments, a cabinet for safekeeping of toxic (A) and potent (B) drugs, instruments and filling materials.

In future profession students must follow the rules of ethics and deontology. "Deontology" comes from the Greek. Deon - debt. And in some cases lexicologist scientists translated it as "the doctrine about debt", in others as "a doctrine about proper" or "science of proper." Anyway, one thing is certain: the professional thinking of any medical specialities, including dentists, concept of good debt or is exceptionally important, and the basic principle of ethics is the conscious subordination of personal interests to the interests of society.

So medical deontology – are a set of ethical standards and principles of behavior of medical staff at performance of their professional duties. From the philosophical point of view, doctrine about proper include:
- General issues of behavior doctor;
- Moral rules that govern relations in the medical team;
- The relationship between doctor and patient in specific conditions of specialties.

Medical deontology includes problems of observing medical confidentiality, the problem of the extent of the medical worker’s responsibility for the life and health of the patient, and problems of relationships of medical workers to each other. In ac-
cordance with medical deontology, in relation to the patient, the medical worker must evince maximum attention and use all his knowledge in order to restore the patients’ health or bring relief to him in his sufferings; he must convey to the patient only information about his health that will be beneficial to him and establish contact between the patient and the physician. He must avoid conversations and discussions with colleagues, personnel, at the presence of the patient and with the patient himself concerning his illness as it can sometimes produce the development of iatrogenic diseases.

**Iatrogenic diseases** are diseases resulting from doctors or medical personnel professional mistakes or negligent attitude (relation) to the patient. The incorrect anamnesis collection, the acquaintance of the patient with the results of laboratory researches etc. can cause iatrogenic diseases. I.Kassirskiy gives the characteristic of the basic reasons and forms of iatrogenic diseases development.

1. Direct traumatizing of the patient by the doctor or medical personnel owing to norms infringement of so-called mental asepsis.
2. Indirect traumatizing concerning the medical literature reading.
3. The iatrogenic disease concerning patient’s personality predisposed to psychopathic, psychosthenic reactions.
4. Doctor’s improper instrumental examination, mistaken drugs introduction.
5. The form of iatrogenesis arising when even after successful treatment of any disease by the experts of the appropriate field the other pathology develops requiring the competence of other medical specialist.

Iatrogenic diseases development is powerful disadvantage of doctors’ activity. Their prophylaxis promotes: professional skills improvement as well as stomatologists’ general (common) and personal culture, possession of medical deontology bases and its rules application in the daily practical activity.

The dentists’ work is known to be accompanied by the influence of a number of adverse factors: excessive stress of analyzer systems, awkward posture while working, uncomfortable microclimate, insufficient or poor lighting, noise, exposure to chemical allergens, excessive bacterial air pollution of dental surgeries, UV radiation etc. The medical personnel health condition depends on operating posture, dental equipment and furniture design and workplace as well.

Unfavorable working environment is among risk factors of dentists for the development of work-related diseases. There are the following types of hazards:

1. Chemical (acids, alkalis, neurotropic substances, dust, etc.);
2. Physical (temperature, noise, vibration, ionizing radiation, etc.);
3. Biological (bacterial and viral origin);
4. Overstrain of individual organs and systems (musculoskeletal, peripheral nerves, blood vessels disorders);
5. Professional neuropathy and dyskinesia.

Dentist’s work is connected with the effect of all five risk factors that are specific for industrial hazards. Bacterial spray has especially strong effect on the dentist’s organism. Local vibration, dental unit noise, ultrasound, drugs, filling, impression materials effect, cross-infection, the overstrain of individual organs and systems
are considered to be among the risk factors as well. The combined action of these factors increases the effect of each.

The dentist’s work should be properly paid because of the high level of unsafe working conditions.

Prolonged upright posture results in muscles fatigue of legs, trunk, neck and back. The lower extremities are exposed to excessive static load leading to blood inflow and passive congestion. It is determined that prolonged operating in such position results in increased arterial and venous pressure of the calf and thigh on average by 50%. As a result, there are circulatory disturbances in the blood vessels of the extremities, pelvis and even the abdominal cavity. This causes severe problems, especially in women such as vasospasm, painful sensations in the calf muscles, varicosity of the extremities, and stagnation in the pelvic organs. Prolonged upright posture can result in blood redistribution (blood inflow of the lower extremities and outflow from the upper body) and can cause dizziness, loss of consciousness, visual impairment.

Improper posture (tilt forward) the center of gravity is shifted and the pressure is redistributed to the extended supporting leg. This can lead to excessive fatigue of the legs muscles, pain in the calf muscles and Achilles tendon. Over time, these effects become worse and pain occurs during walking. Prolonged overloading causes various foot deformations. Static disorders can also lead to spinal curvature. Low lumbar lordosis and abnormal upper spinal curvature are common disorders either. Muscle tension of locomotive system within 5 hours or longer can lead to a "spiral" spinal curvature in the thoracic and lumbar regions and S-shaped scoliosis development.

The prolonged unilateral loading typical for dentist leads to the muscles fatigue and ligaments stretching followed by the joints weakening and bone structure displacement. Degeneration of intervertebral discs, spinal osteochondrosis are developing.

The upper part of the dentists’ body is usually tilted to the right. This causes a slight but constant compression and limitation of the chest motion leading to insufficient lungs ventilation. In women it may cause bile secretion dysfunction. It is also possible to detect changes in the myocardium of the anterior and posterior walls of the heart. The forced tilt of the head causes excess loading on the cervical and occipital muscles that can lead to headaches and accumulation of salts in the cervical region.

The instruments with tiny working parts (files, barbed broaches etc.) should be selected under sufficient illumination (at the window or local lighting to diminish the visual tension). Constant tension of visual analyzer can lead to various eye diseases (myopia). Light cured composite materials are known to be polymerized under the influence of a powerful stream of the visible blue light spectrum in the range of 400-500 nm. The spectrum range of light cure lamps varies from different manufacturers and covers the exciting range of ultraviolet radiation (400 - 380-360 nm). In addition, in case of lamp malfunction or prolonged uncontrolled exploitation of light cure lamp bulb there is also a light flow of the lower range that is extremely dangerous for the organs of vision. Ultraviolet radiation with a wavelength in the range of 200-300 nm causes burns of the cornea and lens opacity (A.M Ostrovsky, I.B. Fedorovych, 1982;
A.K. Nikishyn, 1996). In this regard dentists should systematically monitor the light flow power.

The work-related disorder of dental specialists also comprises carpal tunnel syndrome. Carpal tunnel syndrome occurs when the median nerve (Nervus medianus) which runs from the forearm into the palm of the hand, becomes pressed or squeezed at the wrist. The disorder is manifested by pain, paresthesia and fingertips numbness, night pain and muscle fatigue. Carpal tunnel syndrome is often the result of dental work associated with high loadings on the muscle-flexors of the fingers, especially the use of blunt centreless instruments and tools with thin handles. Carpal tunnel syndrome is exacerbated by intensive, strenuous work without breaks and holidays. Most modern dental instruments are produced with anatomical handles design to minimize muscular tension.

The tension of individual muscles groups can lead to fingers distortions, tenosynovitis, and rheumatic lesions of certain joints. Prolonged spastic contraction of digital blood vessels combined with hypothermia (frequent hand washing) can lead to Raynaud's disease characterized by sudden cooling and numbness of fingers.

The objects surfaces of dental office located especially close to the patient may be contaminated with pathogenic microorganisms. Therefore, healthcare professionals must comply with the infectious safety requirements i.e. keeping hand hygiene and medical gloves wearing. It is necessary to remember that instruments are exposed to bacteria during contact with patient’s blood and saliva, hard tooth tissues, spray during a drilling procedure as well as during the contact with other tools and materials. Not only used but opened and prepared for work tools and handpieces are exposed to contamination. Contaminated instruments are the source of hazard for either the patient or medical staff. The doctor is obliged to apply the treatment sterile instruments only.

The most important dentist’s instruments are doctor’s hands. Therefore, the greatest attention should be paid to hands washing, their regular disinfection and hygiene as well as gloves wearing to protect hands from infection during contact with patient’s blood and saliva. The risk of infection increases with the development of new diseases such as AIDS and so-called "prion" diseases as well as previously known such as hepatitis B, C.

During cavities preparation with high-speed drills it is recommended to protect respiratory organs of the dentist and assistant against various aerosols with special masks that need to be replaced every 4 hours or disposable respirator type "Lepestok-200." It is also necessary to protect dentist’s vision organs with special glasses. During the tartar removal, it is needed to wear shield to protect the face.

The prolonged dentist’s emotional stress should be also considered. It mainly occurs during continuous restorations of dental hard tissues (one tooth restoration can often last for 3-4 hours). The nervous system gets tired faster than muscular, so the creating of psychological relaxation background can significantly prevent it and increase the efficiency of dental team. The appropriate psychological attitude is created due to color design of additional facilities.

It is necessary to introduce effective measures to prevent work-related diseases among dentists. It is advisable to practice regular advisory visits to dental clinics by
specialists for dentists’ routine checkups to identify work-related diseases and working conditions improvement.

Safety requirements before work
To check the personal protection equipment status of personal protective equipment and wear it if needed.
To check the presence of the instruments, the materials needed, equipment and medications.
To check the condition and functioning of draughts, the integrity of wires, plugs and sockets. It is not allowed to turn the appliances on if the wires show signs of damaged insulation.

Safety requirements during work
During the carious cavities preparation with high-speed drills it is necessary to protect respiratory organs of the dentist and assistant against various aerosols with special masks that need to be replaced every 4 hours.
When working with light cure lamps it is needed to wear protected glasses to shield the dentist’s eyes.
During the tartar removal, it is needed to wear shield to protect the face.
In case of any damage, it is necessary to turn the equipment off and apply to medical equipment service.
The procedures connected with contamination of the hands with saliva, wounds secretions, spittoons transfer etc., require hand protection with rubber gloves.

Safety requirements after work
Remove instruments, medications and put them into storage place.
Wash and disinfect used rubber gloves by immersion into 0.5% chlorine bleach solution for an hour.
Turn all electrical appliances off the network.
Put the protective clothing when in contact with amalgam into a specially designated storage place.
Carry out hands hygiene according to the type of the work performed.
Make a report for the supervisor of any deficiencies during operation.

Safety requirements in emergencies
Emergencies in dental office can arise in case of electric shock, spill of potent drugs, chemicals, disinfectant solutions, equipment failure etc.
In case of accident or situation leading to an accident or emergency state the work should be immediately ceased by turning the equipment off the power, make a report for manager about emergencies and disallow unauthorized persons into the danger zone.
If there are victims, provide them with first aid and call ambulance if necessary.
In case of fire call the fire department and start firefighting with anything available.
Carry out all the instructions of the person responsible for breakdown elimination.

6. Self-monitoring materials:
A. Tasks for self-control

1. According to existing specifications, the area of a stomatologic office on one doctor should make not less:
   A) 7 m²;
   B) 12 m²;
   C) 14 m²;
   D) 17 m²;
   E) 24 m².

2. Level of light exposure of a stomatologic office should make not less:
   A) 100 lux;
   B) 200 lux;
   C) 300 lux;
   D) 400 lux;
   E) 500 lux.

3. At anaphylactic shock necessarily introduction:
   A) Corvalolum;
   B) Isotonic solution of sodium chloride;
   C) Clophelinum;
   D) Prednizalony or hydrocortizony;
   E) Nitroglycerinum.

4. Psychogenic frustration arising in an investigation of deontological mistakes of medical workers - wrong, careless statements or actions is called:
   A) Neurosis;
   B) Iatrogenic;
   C) "Placebo" - effect;
   D) Pseudo-illness;
   E) Cancerophoby.

5. Medical means for the urgent help at hypertonia:
   A) Suprastin, eupheliny, nitroglycerine;
   B) Prednizolony, hydrocortizone, dibazole;
   C) Nitroglycerine, prednizolony, clopheline;
   D) Dibazole, dimedrol, adrenaline hydrochloride;
   E) Dibazole, plathypheline, clopheline.

6. Aspect of medical deontology are:
   A) Mutual relations between patients;
   B) Mutual relations of medical workers with relatives of the patient;
   C) Informing of the patient on his rights;
   D) The humane relation to the patient;
   E) Informing of the patient on a condition of his health.

7. Realisation of the ethical beginnings in medicine includes:
   A) Informing of the patient on his rights;
   B) Mutual relations;
   C) Mutual relations of the doctor with relatives of the patient;
   D) Mutual relations of the doctor and the average medical personnel;
E) The illness prevention.
8. The sudden short-term loss of consciousness arising from a sharp angiospasm of a brain, an indulgence of activity of cardiovascular and respiratory system is called:
A) Anaphylactic shock;
B) Hypertensive crisis;
C) Quinckes edema;
D) Collapse;
E) Unconsciousness.
9. The heavy allergic reaction proceeding as sharp cardiovascular and suprarenal insufficiency is called:
A) Hypertensive crisis;
B) Quinckes edema;
C) Unconsciousness;
D) Anaphylactic shock;
E) Collapse.
10. For inspection of an oral cavity and performance of the basic medical manipulations exists a constant tooling. To it enter:
A) Mirror, tweezers, probe, dredge, smoothe, metal spatula, condenser;
B) Stomatologic mirror, tweezers, probe, condenser-smoothe;
C) Stomatologic mirror, tweezers, probe;
D) Stomatologic mirror, tweezers, probe, dredge;
E) Stomatologic mirror, tweezers, probe, dredge, set of endodontic tools.

**B. The algorithm of practical skills**

<table>
<thead>
<tr>
<th>Main tasks</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lead acquaintance with equipment and job of a therap. consulting room.</td>
<td>To carry out in such sequence: 1. Lead processing of arms. 2. Following rules of an aseptic and anti-septic select the instruments for inspection tray. The structure of an inspection tray: stomatological mirror, stomatological forceps, stomatological probe.</td>
</tr>
<tr>
<td>2. Prepare a workplace of the student - stomatologist.</td>
<td>1. Place the patient in a dental chair conveniently. 2. Lift it to the required height. 3. Switch on and install the appliance, fix the head restraint. At job on the top jaw the face of the patient is on the level of a brachium of the doctor, at job on a mandible - on the level of an elbow.</td>
</tr>
<tr>
<td>1. To teach the safety precautions regulations at job in stomatological therapeutic consulting room.</td>
<td>In addition, listen to the instructor's tutor or responsible for safety techniques</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Modify emergency conditions in a dental armchair, pick up medicines and provide emergency care.

1. To give the first aid at a loss of consciousness. To know features, percentage concentration of medicamental agents of a first aid.

2. To give the first aid at cardiovascular failure. To know features, percentage concentration of medicamental agents of a first aid.

3. To give the first aid at an anaphylactic shock and allergic condition. To know features, percentage concentration of medicamental agents of a first aid.

1. Stop realization of manipulation
2. Release the patient of compressive clothes (unbutton the top button, undo a tie);
3. Give to the patient of a horizontal position (position by Trendelenburg, when the head is posed below than level of a trunk) or incline a trunk forward and downwards and, pressing on an occipital site, ask the patient to render resistance, that is to do straighten movement;
4. Lead exaltation of respiratory center by a boring of receptors of a nose by 10 % solution of ammonia (to present to a nose on a cotton plug, the patient now makes an inspiration).

If there is no effect – caffeine-sodium benzoate (1 ml, 10% solution) 2.1 ml of Cordiamin. ephedrine (1 ml, 5% solution) or mesaton (1 ml, 1%) are injected subcutaneously; in case of bradycardia atropine sulfate (1-0,5 ml 0,1% solution) is injected subcutaneously.

Validolum, Corvalolum, solution of Cordiaminum, Strophantinum, Corgliconum.

Intramuscular (IM) or intravenous (IV) injections of prednisone (90-150 mg) or hydrocortisone (100-300 mg) are administered. Intramuscular glucose (500 ml, 5% solution) or sodium chloride isotonic solution together with pipophen (2 ml, 2.5%), adrenaline hydrochloride (0,5 ml, 0.1%) are injected. Euphylline (10 ml, 2.4%) is injected in case of bronchospasm symptoms, Lasix (2 - 4 ml) and Corglycone (0,5-1 ml, 0.06%) are injected in case of in heart failure. All measures are accompanied by inhaled humidified oxygen and the airways patency is constantly mon-
4. To give the first aid at increased blood pressure and hypertensive crisis. To know features, percentage concentration of medicamental agents of a first aid.

Dibasol (4 ml. 0.5%), Platiphyllini hydrotartras (1 ml, 0.2%) and chlorpromazine (0.5-1 ml, 2.5%). If there is no immediate threat to the life blood pressure should be reduced gradually (over several hours). The main antihypertensive drugs should be administered orally or sublingually. First, we should use of antihypertensives in tablets, the most studied for emergency care are Nifedipine, Captopril, Clonidine. Klofelin (clonidine) is the safest drug to reduce blood pressure, it is indicated for any type of hypertensive crisis. It is sold only in pharmacies by prescription. Clonidine taking is as follows: the first tablet (0.15 mg) is taken sublingually, the second tablet (if necessary) in 30 minutes (dosage 0.075 mg; two times less than the first). Driving is the contraindication for Clonidine. In case of stress hypertensive patients should take Corvalol (1 teaspoon), in case of heartache - nitroglycerin (spray is better – it acts faster).

The patient should be warmed. With the condition deterioration it is necessary to inject subcutaneously epinephrine hydrochloride (0.5-1 ml, 0.1%) or IV dropper with noradrenaline hydrotartras (0.5-1 ml, 0.2%) and glucose (250 ml, 5%) (10-15 drops per min.) under the control of blood pressure, or mezaton subcutaneously (1 ml, 1%), intravenously prednisolone (60-90 mg), Corglycon (1 ml, 0.06%) and glucose (20 ml 40%) are injected intravenously. Artificial ventilation is done if necessary.

5. To give the first aid at collapse. To know features, percentage concentration of medicamental agents of a first aid.

B. Clinical tasks:

A 22-year-old student arrived for an appointment with a dentist in the afternoon after his classes were over. The patient is registered for regular check-ups with an endocrinologist. During treatment the patient developed excited state followed by loss of consciousness. Objectively: tremor of the extremities, moist skin, heart rate - 100/min., BP- 100/60 mm Hg. What diagnosis is most likely?

A. Hyperglycemic coma
B. Hypoglycemic coma
C. Anaphylactic shock
During administration of Ultracain solution for infiltration anesthesia the condition of a 22-year-old patient sharply deteriorated. The patient became inert, silent, developed cough attacks, expiratory dyspnea, wheezing. Viscous slimy sputumis expectorated. What urgent condition did the patient develop?

A. Asphyxia  
B. Anaphylactic shock  
C. Bronchial asthma attack  
D. Collapse  
E. Hypertensic crisis

A 34-year-old man came to a dental clinic for extraction of the 26 tooth. After application of 1,7 ml of Ultracain (Articaine) solution for local anaesthesia the patient developed general fatigue and nausea. Objectively: the skin is pale, cold, cyanotic, covered in clammy sweat; BP is 60/40 mmHg. What urgent condition did the patient develop?

A. Urticaria  
B. Anaphylactic shock  
C. Loss of consciousness  
D. Bronchial asthma  
E. Collapse

When conduction anaesthesia had been administered by a dentist, in 2 seconds a patient developed the following symptoms: loss of consciousness, seizures, dilated pupils, absent pupillary response to light, low arterial pressure, laboured breathing, muffled heart sounds. What is the most probable diagnosis?

A. Syncope  
B. Cardiac infarction  
C. Anaphylactic shock  
D. Collapse  
E. Stroke

A 45-year-old patient undergoes teeth preparation. 15 minutes after anesthetization with 4% solution of Ubistesin forte the patient developed hyperemia of skin, increased heart rate, headache, syncope. Previously the patient had not exhibited such reaction to this anesthetic. What complication occurred in the patient?

A. Syncope  
B. Arterial pressure rise  
C. Myocardial infarction  
D. Collapse  
E. Anaphylactic shock

C. Not typical tasks:

1. During realization by the student of 3-rd course silvering of 37 teeth the patient had complaints to a burning sensation in an oral cavity. At survey the circumscribed sites of white colour on a mucosa are revealed in the field of transitive pleat of a mandible and around of a tooth. By what safety precautions regulations did not keep on the student at realization of silvering?
2. During realization of tool processing of root canals of 27 teeth the patient had acute attack of tussis, after which ending the doctor has found out absence of a working file. What rules of safety were broken at job by fine endodontical toolkit?

3. During realization of stomatological manipulations there was a deterioration of state of health of the patient, has arisen loss of consciousness. What actions are necessary for leading for rendering to the patient of a first aid?

7. Recommended literature

**Base:**

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 docent Marchenko I.Ya.
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>Module 1: Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td>Content module № 1</td>
<td>“Inspection of the stomatological patient with odontopathoogy”</td>
</tr>
<tr>
<td><strong>Topic 3</strong></td>
<td>Scheme of the stomatological patient inspection. Subjective examination: finding out of the complaints, anamnesis of disease and life. The characteristic of a pain syndrome at various odontological diseases.</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 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. The study of the basic methods of inspection of the stomatological patient forms the basis for diagnostics of stomatological diseases. They will help the future doctor to distinguish not only odontopathology, but quite often diseases of other bodies and systems.

2. **Specific goals:**
   - To familiarize with the basic clinical methods of inspection of the stomatological patient: subjective and objective;
   - To know:
     1. The circuit of inspection of the stomatological patient;
     2. The possible complaints of the stomatological patient, sequence of their finding out;
     3. Sequence of clearing of an anamnesis of disease and anamnesis of life, their importance in diagnostics of odontopathology;
   - To be able:
     1. Consistently to lead subjective inspection of the patient
     2. To collect the patient’s complaints;
     3. To find out an anamnesis of disease;
     4. To find out an anamnesis of life.

3. **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>History of medicine</td>
<td>To know stages of growth of a domestic stomatology, ethical and deontological principles of job; To be able to use deontological principles and ethical norms at realization of inspection of the stomatological 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>Principles of inspection of the stomatological therapeutic patient</td>
<td>Principles – are general requirements, essential characteristics, responsible for the proper functioning of the system, without which it would not fulfill its purpose. There are same principles of inspection: Ethical and deontological principle Anaesthesiological principle The principle of technical rationality The principle of a sequence and uniform strategy</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>Circuit of examination</td>
<td>Presentation, description of something in general terms, without details;</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Anamnesis of disease (anamnesis morbi)</td>
<td>The main subjective method of examination of the patient, consisting in obtaining information about the patient and his illness through questioning (interrogatio aegroti) – history of disease development</td>
</tr>
<tr>
<td>Anamnesis of life (anamnesis vitae)</td>
<td>History of life</td>
</tr>
</tbody>
</table>

4.2. Theoretical questions to the lesson:

1. What there are sections of inspection of stomatological patient?
2. What section does the subjective inspection of the patient consist of? What factors do it tightness depend on?
3. List the basic complaints of the stomatological patient.
4. Name a sequence of the collecting of an anamnesis of disease.
5. Name a sequence of the collecting of an anamnesis of life.

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

1. To prepare stomatological installation, dental surgery armchair for job, to select a necessary tooling for inspection of the patient.
2. To lead finding - out of a passport part and patient’s complaints;
3. To lead finding – out the anamnesis of disease;
4. To lead finding - out the anamnesis of patient’s life.

5. The contents of the topic:

General principles of inspection of the stomatological therapeutic patient

Ethical and deontological principle provides use of certain professional, moral, rules of law during performance of the duties. Anaesthesiological principle provides painless realization of inspection and therapeutic manipulations. The principle of technical rationality consists in an individualization of the circuit of inspection, techniques of treatment, and also ergonomic maintenance of job. The principle of a sequence and uniform strategy provides use of the uniform circuit of inspection and standard classifications, of modern well-known methods of treatment.

The inspection of the patient in therapeutic branch of stomatological polyclinic is carried out under the fixed circuit. It allows to avoid loss of the important facts, details of current of disease.
The circuit of examination of the stomatologic patient

I. Subjective inspection (status presens subjectivus).
   1. Passport part.
   2. Complaint of the patient (molestiae).
   3. Anamnesis of disease (anamnesis morbi).

II. Objective inspection (status presens objectivus).
   1. External survey of the patient.
   2. Survey of the face of the patient.
   3. Palpation of regional lymphatic nodes and thyroid glands.
   5. Survey actually oral cavities.
   6. Inspection of a place of disease (locus morbi).
      • Survey of a tooth and environmental tissues (inspectio);
      • Probing;
      • Percussion (vertical, horizontal) (percussio);
      • Palpation of a mucosa in the field of a projection of an apex of a root (palpatio).

III. The previous diagnosis (diagnosis probabilis).

IV. The plan and results of additional inspection of the patient (methodi explorationis succenturiati).

V. Differential diagnostics (diagnostica differentialis).

VI. The clinical diagnosis (diagnosis clinica).

SUBJECTIVE INSPECTION (status presens subjectivus).

Is spent with the help of inquiry (question) of the patients. In time of making inquiries it is necessary to establish confiding contact with the patient, to define his psychological status, intelligence and on this basis to analyse the complaints, course of development of disease. The doctor by inducing accessible questions should help the patient to state a case history.

Passport part.
   1) Surname, name, patronymic;
   2) Age;
   3) Sex,
   4) Home address;
   5) place of job,
   6) Trade;

The complaints of the patient (molestia)

The complaints of the patient should be stated in the following order:
   a) Basic odontological complaint (for example: a pain);
   b) Additional, explaining basic (character of a pain);
   c) The complaints, which accompany of odontological (smell from an oral cavity).

In a therapeutic stomatology the complaint can be connected to a defeat:
   a) hard tissues of a tooth,
   b) pulp,
   c) periodontium,
d) parodontium,
e) mucosa of an oral cavity.

Statement of the complaints at not carious defeats of teeth, caries and its complications we begin from the complete characteristic of a pain:

1. Character of a pain:
   a) Acute, blunt, tedious;
   b) Short-term, long;
   c) causal or spontaneous;
   • If a pain is causal - to specify the reason: from thermal, chemical, mechanical irritants, at biting on a tooth, at moving a body etc.;
   • After elimination of irritant the pain: stops, lingers over, there is a new attack of a pain;
   • If spontaneous - constant or paroxysmal (duration of pain attacks and intermissions), night;
   d) localized (with the indicating of a jaw and party of a defeat) or irradiating (wide-spread) to specify zones irradiation.

2. Presence of a carious cavity or defect of hard tissues of a tooth.

3. Impossibility or difficulty of reception of nutrition (to specify the reason).

4. Presence of a fistula and secretion from it.

5. Asymmetry of the face.

6. Cosmetic defect:
   • The atypical form of a tooth;
   • Discoloration of a tooth;
   • Defect of a crown;
   • Defect and discoloration of a filling.

7. Unpleasant smell (faeter ex ore) from a mouth is characteristic for a chronic gangrenous pulpitis, ulcerous-necrotic gingivitis by Vensan etc.

Anamnesis of disease (anamnesis morbi)
The inquiry can be spent as a free statement by the patient of development of disease or as the answers to questions of the doctor. In an anamnesis of disease it is necessary to find out:

• Condition of a tooth before occurrence of the complaints (tooth earlier was treated, whether or not);
• Beginning (year, month, day) of occurrence of first attributes of disease, their reason;
• Features of current of illness;
• Dynamics(changes) of its separate periods (exacerbations and remissions);
• Dynamics(changes) of pain sets of symptoms;
• Occurrence of complications;
• The items of information on character of treatment and its efficiency;
• The items of information on a selftreatment.

Anamnesis of life (anamnesis vitae)
The detail of the collecting of an anamnesis of life depends on the complaints of the patient, condition of an oral cavity and general condition of the patient. The anamnesis of life can be specified and be supplemented after survey of an oral cavity of the patient.
Shortly to state:

- Household anamnesis (condition of life, full value of a feed);
- Labour anamnesis (condition of job, industrial harmfulnesses, their character);
- Allergological anamnesis (presence of allergic reactions on medicamental preparations, products of a feed etc.);
- Presence of harmful habits. The special attention to give to revealing and description:
  - The transferred and accompanying diseases;
  - Complications in a course of their treatment;
  - Whether the patient is on the account at the profile experts.

The anamnesis of life of the patient can be investigated with the help of questionnaire. It will enable the patient to be more frank and relieves the doctor of necessity of statement of difficult faceal questions.

6. **Self-monitoring materials:**

A. **Tasks for self-control to topic**

1. **At subjective inspection of the patient spend:**
   A) External survey of the patient, interrogation;
   B) Interrogation;
   C) Survey of a tooth and surrounding tissues;
   D) Survey of the patient face, interrogation;
   E) External survey, survey of the patient face, interrogation.

2. **In the disease anamnesis find out:**
   A) Condition of a tooth before occurrence of complaints, features of a current of illness, character of a pain;
   B) Character of a pain, time of occurrence of first signs disease;
   C) Condition of a tooth before occurrence of complaints, or occurrences of first signs of disease, feature of a current of illness;
   D) The transferred or accompanying diseases;
   E) Allergological, the labour anamnesis.

3. **Aching, long, more often the localised causal pain which is not stopping some time after elimination of irritance, is characteristic for:**
   A) Chronic forms of a pulpitis;
   B) Chronic forms of caries;
   C) Acute forms of caries;
   D) Chronic forms of a periodontitis;
   E) Exacerbation of chronic forms of a pulpitis.

4. **The aching not sharp pain at chewing of firm food, biting on a tooth is characteristic for:**
   A) Chronic forms of caries;
   B) Chronic forms of a pulpitis;
   C) Not carious defeats;
   D) Chronic forms of a periodontitis;
   E) Exacerbation of chronic forms of a periodontitis.
5. Acute, constant, spontaneous pain amplifying at biting on a tooth, feeling of "an evolved tooth" is characteristic for:
   A) Acute forms of caries;
   B) Acute forms of a pulpitis;
   C) Neuralgia of a trigeminal nerve.
   D) Exacerbation of chronic forms of a pulpitis;
   E) Acute forms of a periodontitis;

6. Subjective inspection of the patient consists of what sections:
   A) External survey, a passport part, the disease anamnesis, the life anamnesis;
   B) Passport part, the life anamnesis, the disease anamnesis, tooth survey;
   C) Passport part, complaints of the patient, the disease anamnesis, the life anamnesis;
   D) Passport part, complaints of the patient, the disease anamnesis, tooth survey;
   E) Complaints of the patient, the basic and additional methods of inspection of a place of disease.

7. The pain at which the patient accurately specifies in a causal tooth, is called:
   A) Causal;
   B) Acute;
   C) Short-term
   D) Irradiated;
   E) Localised.

8. The pain arising from action mechanical irritant, is called:
   A) Spontaneous;
   B) Aching;
   C) Acute;
   D) Short-term;
   E) Causal.

9. The constant or attack-shaped pain arising irrespective of irritants action, is called:
   A) Acute;
   B) Short-term;
   C) Aching;
   D) Spontaneous;
   E) Neurologic.

10. Irradiated pain is characteristic for:
    A) Acute forms of caries;
    B) Exacerbation of chronic forms of a pulpitis and periodontitis;
    C) Chronic forms of a pulpitis;
    D) Chronic forms of a periodontitis;
    E) Exacerbation of chronic forms of a periodontitis, chronic periodontitis.

B. The algorithm of practical skills

<table>
<thead>
<tr>
<th>Main tasks</th>
<th>Indications to performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>To teach principles of</td>
<td>Ethical and deontological</td>
</tr>
<tr>
<td>inspection of the tooth</td>
<td>principle provides use of</td>
</tr>
<tr>
<td></td>
<td>certain professional, moral, rules of law during performance of the duties.</td>
</tr>
<tr>
<td></td>
<td>Anaesthesiological principle provides painless realization of</td>
</tr>
</tbody>
</table>
stomatological patient inspection and therapeutic manipulations. The principle of technical rationality consists in an individualization of the circuit of inspection, techniques of treatment, and also ergonomic maintenance of job. The principle of a sequence and uniform strategy provides use of the uniform circuit of inspection and standard classifications, of modern well-known methods of treatment.

To lead in such sequence: 1. To find out a passport part; 2. To find out the complaints of the patient: basic odontological (pain); additional, explaining basic (character of a pain); the complaints, which accompany basic (presence of a carious cavity, unpleasant smell, delay of nutrition). To pay attention to character of a pain: a) acute, blunt, tedious; b) short-term, long; c) casual or spontaneous; - if casual - to specify the reason: from therm., chem., mechanical irritants, at biting on a tooth, at moving a body etc.; - after elimination of irritant the pain: stops, lingers over, there is a new attack of a pain; - if spontan.- constant or paroxysmal (duration of pain attacks and intermis.), night; d) Localized or irradiating to specify zones of irradiation.

3. To find out an anamnesis of disease: a condition of a tooth to occurrence of the complaints (the tooth was treated earlier, whether or not) ; a beginning of occurrence of first attributes of disease, their reason; features of current of illness (dynamics of pain sets of symptoms, occurrence of an exacerbation and complications); the items of information on character of treatment and its efficiency; the items of information on a selftreatment. 4. to find out an anamnesis of life - household anamnesis (condition of life, full value of a feed); - a labour anamnesis (condition of job, industrial harmfulnesses their character); - an allergological anamnesis (presence of allergic reactions on medical preparations, products of a feed etc.); presence of harmful habits.

7. Recommended literature

**Base:**
7. Stock C.J.R., Nexammer C.F. Endodontics in practice // British Dental
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 docent Marchenko I.Ya.
Methodical Instruction
for independent work of students
during preparation for practical classes and in classes

<table>
<thead>
<tr>
<th><strong>Educational discipline</strong></th>
<th>Therapeutic Stomatology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module 1:</strong></td>
<td>Module 1: Methods of inspection of the stomatological patient. Diseases of tooth hard tissues</td>
</tr>
<tr>
<td><strong>Content module № 1</strong></td>
<td>“Inspection of the stomatological patient with odontopathoogy”</td>
</tr>
<tr>
<td><strong>Topic 4, 5</strong></td>
<td>Clinical methods of inspection and their importance for diagnostics of oral cavity diseases: the review (external, face of the patient, vestibule, actually oral cavities, dentition). Inspection of disease place (Locus morbi): surveys, probing, percussion, palpation.</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 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. The study of the basic methods of inspection of the stomatological patient forms the basis for diagnostics of stomatological diseases. They will help the future doctor to distinguish not only odontopathology, but quite often diseases of other bodies and systems.

2. **Specific goals:** To familiarize with the basic clinical methods of inspection of the stomatological patient: subjective and objective;
   
   - To know:
     1. Technique of realization of external survey of the patient, survey of the face, vestibule and actually oral cavity;
     2. Technique of realization of survey of a sick tooth, clinical variants of norm and pathology;
     3. Parameters of estimation of probing;
     4. Definition, kinds and technique of realization of a percussion, estimation of its results;
     5. Technique of realization of a palpation of a mucosa in the field of a projection of an apex of a root, estimation of its results.
   - To be able:
     1. To lead external survey of the patient, to estimate a general condition, consciousness, expression of the face, body height, mass of a body, constitutional type;
     2. To inspect the patient’s face: to estimate symmetry, condition of a skin, expressiveness of pleats, condition of seen mucosas;
     3. To inspect a vestibule and actually oral cavity: to estimate a condition of a mucosa, attachment of bridles of labiums, tongue, occlusion, size and structure of tongue, condition of papillas etc.
     4. To lead inspection of a sick tooth: its survey, probing, percussion, palpation.
3. 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>History of medicine</td>
<td>To know stages of growth of a domestic stomatology, ethical and deontological principles of job; To be able to use deontological principles and ethical norms at realization of inspection of the stomatological patient</td>
</tr>
<tr>
<td>Psychology</td>
<td>To know psychological problems, which arise at the patient during realization of stomatological manipulations; To be able to use the psychological approach at reception of the stomatological patient</td>
</tr>
<tr>
<td>Biophysics</td>
<td>To know features of job of electrodevices, safety precautions; To be able to use the safety precautions at job with stomatological installations, electrodevices</td>
</tr>
<tr>
<td>Internal illnesses</td>
<td>To know diseases of internal bodies, which have displays in an oral cavity; To be able to define interrelation between diseases of internal bodies and their displays in the oral cavity. To spend adequate treatment and prophylaxis.</td>
</tr>
<tr>
<td>Propedeutics of a therapeutic stomatology</td>
<td>To know stomatological toolkit: kinds, purpose, kinds of handpieces, burs, safety precautions regulation at job with them.</td>
</tr>
<tr>
<td>Propedeutics of a 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>Circuit of examination</td>
<td>Presentation, description of something in general terms, without details;</td>
</tr>
<tr>
<td>Anamnesis of disease (anamnesis)</td>
<td>The main subjective method of examination of the patient, consisting in</td>
</tr>
</tbody>
</table>
Anamnesis of life (anamnesis vitae)

The main subjective method of examination of the patient, consisting in obtaining information about the patient’s life through questioning (interrogatio aegroti) – history of life.

Objective examination

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.

4.2. Theoretical questions to the lesson:

1. List a sequence of realization of objective inspection of the patient.
2. Name parameters, on which the external survey of the patient is spent.
3. Name results of survey of the face in norm, possible changes at pathological condition.
4. Name results of inspection of regional lymphatic nodes in norm, possible changes at pathological condition.
5. Name results of survey of a vestibule and actually oral cavity in norm, possible changes at pathological condition.
6. Changes at pathological condition.
7. Name results of inspection of an intact tooth (survey, probing, percussion, palpation) and possible changes at a pathology.

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

1. To prepare stomatological installation, dental surgery armchair for job, to select a necessary tooling for inspection of the patient.
2. To lead finding - out of a passport part, complaints, anamnesis of disease, life.
3. To lead external survey of the patient, survey of the face, to estimate them by necessary parameters.
4. To lead a palpation of regional lymphatic nodes, to estimate their condition.
5. To inspect a vestibule and properly oral cavities. To estimate their condition.
6. To lead inspection of a sick tooth: survey, probing, percussion, palpation of a mucosa of an oral cavity. To estimate their condition.

5. The contents of the topic:

The circuit of examination of the stomatologic patient

I. Subjective inspection (status presens subjectivus).
   1. Passport part.
   2. Complaint of the patient (molestiae).
   3. Anamnesis of disease (anamnesis morbi).

II. Objective inspection (status presens objectivus).
   1. External survey of the patient.
   2. Survey of the face of the patient.
   3. Palpation of regional lymphatic nodes and thyroid glands.
   5. Survey actually oral cavities.
   6. Inspection of a place of disease (locus morbi).
      • Survey of a tooth and environmental tissues (inspectio);
      • Probing;
      • Percussion (vertical, horizontal) (percussio);
      • Palpation of a mucosa in the field of a projection of an apex of a root (palpatio).

III. The previous diagnosis (diagnosis probabilis).
IV. The plan and results of additional inspection of the patient (methodi explorationis succenturiati).
V. Differential diagnostics (diagnostica differentialis).
VI. The clinical diagnosis (diagnosis clinica).

OBJECTIVE INSPECTION (status presens objectivus).

Survey of the face of the patient. Colour of a skin: in norm - natural (for the European strain - light pink, pink, corporal; for Mongols strain - yellowy-brown; for Negroes - chocolate-brown), at a pathology – reddened (hyperemia), icteric, earthy, pale, cyanotic, with pigmentation or depigmentation fields (to specify localization).

Cleanliness, integrity of a skin: in norm it is conserved, with out of pathological elements: bruises, rashes (to specify character), «vascular sprockets», exanthemas, cicatrices, fistulas, erosions, ulcers. Humidity: moderated, at a pathology – dry, wet. Elasticity and a skin turgor (ability to pleat and straighten after that): in norm - it is conserved; can be reduced, complicated (at an infiltrate).

Symmetry of the right and left half of face: in norm it is symmetric, at asymmetry - to specify the cause (an edema, tumescence, deformation, an infiltrate) with the localization indicating.

State of a skin of angles of a mouth: in norm it is with out fractures, macerations, dryness, erosions. State of a red border of labium: in norm it is moderated humid, with out fractures, crusts, rashes.
State of visible mycoses of a nose, конъюктивы, a lower eyelid: in norm it is pink colour (at a pathology - icteric, reddened, pale, cyanotic), moderated humid, with out of elements of lesions, hemorrhages.

**Inspection of lymph nodi.**

Submandibular nodi (nodi lymphatic submandibularis) are located in number of 6-10 in trigonous submandibulares (their part lies in a depth of a submandibular salivary gland). In them outflow of a lymph from a skin of intrinsic half of top and bottom eyelid, a nose, a cheek, top and bottom labium, molar teeth and premolar teeth of both jaws, and also from muscles, bones, a mucosa of a vestibule of an oral cavity and a nose, конъюктивы is carried out.

Carrying out a palpation of lymphonodi, for the purpose to enervate of muscles, a head of the patient incline in the surveyed side. For a palpation submandibular nodi doctor by right arm inclines a head of the patient downwards and in the conforming side, and by left arm consistently feels their by three fingers, moves out on a jaw body.

Estimate the dimension, the form, a consistence, morbidity, mutual relation with surrounding tissues.

Healthy lymphonodi have size from lentil to a fine pea, soft-elastic consistence, are individual (solitary), mobile (are not soldered to surrounding tissues), are painless.

At an inflammation of periapecal tissues of tooth, bone, periost, mucosa membrane the palpation is defined an augmentation of lymphonodi dimension, densities, and morbidities on the side of lesion.

**Survey of a vestibule of an oral cavity**

Make at close jaws and the relaxed labium, having lifted top and having alighted an under lip and having delayed a cheek by stomatologic mirror.

Estimate:

*Depth of a vestibule:* in norm – middle, can be shallow, deep (profound).

*Affixing of bridles of a top and bottom labium:* in norm - on the middle an alveolar process, can be high - it is close to an interdentally papilla or intertwined in it, low - it is close to a transitive pleat.

*Interrelation of dentitions (occlusion):* physiological - orthognathic, ortogenic; pathological (disgnatic).

*Mucosa of labium and cheeks:*

Colour: in norm - pink, at a pathology – reddened (hyperemia), cyanotic, pale, icteric;

Puffiness: it is defined on presence of impresses of teeth on the line of clamping of teeth;

Degree of wetness: in norm – moderately, can be wet, dry;

Presence of elements of a lesion: in norm – is absent, at a pathology - primary (maculae, a nodule, a hillock, knot, a blister, a pustule, bladder, a cyst), secondary (erosion, an ulcer, a fracture, a crust, a scale, cicatrix, pigmentation);

State of fine salivary glands and their lead-out ducts: in norm - an insignificant tuberous with point lead-out ducts; or a hyperplasia, a heterotopias of salivary glands with expanded ostium of lead-out ducts, a "dew" symptom in region Klein;
Forday’s glands (sebaceous glands): pale yellow nodules in diameter of 1-2 mm which is not towering over a mucosa;

State of papillae of lead-out ducts parotid salivary glands: the dimension, colour, quantity and composition of excreted saliva at its massaging.

*Mucosa of an alveolar process (gum):* in norm - light pink, not hydropic, the marginal edge densely envelop nicks of teeth, gingival papillae have the correct triangular form, occupies interdentally interspaces, depth of a gingival sulcus - no more than 0,5 mm; at a pathology - reddening, cyanosis of a gum, an edema, a bleeding at probing, a hypertrophy, an atrophy of interdentally papillae, efface their peak, an ulcer of gingival edges, presence pathological gingival pocket (to specify depth and composition of a separated exudates).

**Survey actually oral cavities**

*Mucosa solid and a soft palate, forward and back palatal handles, palatine tonsils, a uvula, a back side of a pharynx:*  
- Colour: in norm - light pink, pink, at a pathology - hyperemia, icteric;  
- Humidity: in norm - moderately wet, at a pathology - dryness;  
- Puffiness: in norm - is absent;  
- Lesion element: in norm - is absent, at a pathology - presence vesicles, pustules, erosions, ulcers, turbidity of an epithelium, a papule, etc.

*Tongue:* The dimension: middle, micro- or a macroglossia;  
- Colour: in norm - pink, another - at staining medicinal preparations or foodstuff; at a pathology (for example anaemia - crimson (Gunter’s tongue));  
- Pleating: moderated, strongly expressed penetrating longitudinal and cross-section sulcus;  
- State of papillae (threadlike, funguslike, foliate, gutterlike): are expressed moderately, at a pathology: atrophy - the "glazed" tongue, a keratinization and a hyperplasia of threadlike papillae - "hairy" tongue, a desquamation of papillae of tongue - "geographic" tongue;  
- Scurf: in norm – is absent or insignificant hazy at a tongue root, white-grey scurf on all surface is covered by caseous scurf;  
- Presence of fractures, erosions, ulcers and other elements of a lesion: in norm – is absent.

*Mouth floor:*  
- Colour, mucosa relief: pink, without the focus of a keratinization, turbidity;  
- State of a bridle of tongue: it is expressed moderately, can be short.

Lead-out ducts submandibular and sublingual salivary glands: with out changes.

*Teeth:* It is effected by means of a stomatologic mirror and an acute angle probe from right to left, since dens of the top jaw (molar teeth), and then from left to right, examining mandible dens.  
- Colour: natural - shades from yellow to bluish;  
- Transparency - alive gloss of enamel;  
- The form, size, position of dens in a tooth arch;  
- Integrity of solid tissues of dens: in intact dens the probe freely slips on its surface, detain (hold on) in excavations and fissures;
Stripping (bareness) of nicks of teeth: in norm – is absent;
Motility (it is defined by a forceps or a probe (in lateral dens) by rocking): 1 degree - shift in a vestibule-oral direction, 2 - shift in vestibule-oral and lateral directions, 3 - shift and on an axis of tooth (in a vertical direction);
Presence of not carious lesions (an enamel hypoplasia, a fluorosis, wedge defect, abrasion, enamel erosion, traumatic damages);
Tooth scurf: not mineralized (the food rests, a soft debris, a tooth plaque);
mineralized (over - and undergum an odontolith (calculus); localization. In norm - is absent.

**Inspection of a place of disease (Locus morbi).**

**Survey of defected tooth:**
- Colour of tooth: natural (shades from yellow to blue) or its changes (grayish at a gangrenous pulpitis, at a pulp necrosis; brick-red, pink - at impregnation by resorcinol-formalin, etc.);
- Gloss (transparency of enamel): it is conserved in teeth with an alive pulp;
- Present the filling
- Present the carious cavities or defect of hard tissues of tooth: its form (shape), surface of localization with indicating of class by Black;
- Interrelation of the dimensions of an inlet opening (entrance aperture) with a carious cavity: narrow, wide;
- State of edges of an enamel: colour, fragility;
- Colour of walls of a carious cavity (at a wide inlet opening).

**Probing:**
- Depth of a carious cavity: within an enamel, cloak or nearpulpul dentine. It is sometimes specified after disclosing of a carious cavity;
- Consistence of a dentine on a bottom and walls of a carious cavity: dense or soft;
- Present or absent of perforation of a pulp cavity: in the field of a pulp horn, the wide perforation;
- Morbidity presence: on walls of a carious cavity in range a dentine-enamel border, on a bottom, in point of perforation, in ostium of root channels;

**Percussion (a percussion on tooth).** It is performing by percussion by the tool handle (a probe, a mirror) on a tooth crown. The comparative horizontal and vertical percussion for definition of a state of a marginal and apical periodontium accordingly is made. In intact teeth it is painless, in amazed teeth - sensitive, painful, sharply painful.

**Palpation of a mucosa membrane in the field of a projection of an apex of a root of tooth.** It is carry out by a forefinger of the right hand or big and forefingers simultaneously from the vestibular and oral side of an alveolar process. Estimate:
- Morbidity; Presence of an obvious hyperemia and edema; of cicatrices; Presence of fistulas, with the indicating of character of separated exudates.

**6. Self-monitoring materials:**

**A. Tasks for self-control to topic № 4**
1. To primary elements of defeat of a mucous membrane belong:
A) Stain, small knot, squamule, a hem;
2. To secondary elements of defeat of a mucous membrane belong:
   A) Small knot, squamule, a hem, erosion;
   B) Small knot, vial, crust, cyst;
   C) Erosion, ulcer, crack, pigmentation;
   D) Crack, squamule, a small knot, cyst;
   E) Squamule, a crack, erosion, tubercle.

3. Glands by Fordaes it:
   A) Primary elements of defeat of a mucous membrane;
   B) Secondary elements of defeat of a mucous membrane;
   C) Small salivary glands;
   D) Sebaceous glands;
   E) Hypertrophied fungiform papillas.

4. Name the kinds of tongue papillas:
   A) Filiform, fungiform, medial, lateral;
   B) Filiform, fungiform, central, gutterlce;
   C) Filiform, foliate, central, gutterlce;
   D) Filiform, gutterlce, foliate, fungiform;
   E) Central, fungiform, medial, lateral.

5. For inspection of fosses, fissures, sites of demineralization, carious cavities use:
   A) Probe, tweezers, dredge;
   B) Cover, tweezers, dredge;
   C) Probe;
   D) Probe, tweezers;
   E) Dredge.

6. In carious cavities define degree of a softening of hard tissues (enamel, dentine) with the help:
   A) Probe, tweezers;
   B) Probe, dredge;
   C) Probe;
   D) Dredge;
   D) Probe, dredge, scaler.

7. Presence of pathological mobility of a face-to-face teeth define:
   A) Palpation;
   B) Percussion;
   C) EOD;
   D) Probe;
   E) Tweezers.

8. To physiological bites belong:
   A) Medial, orthogenetic, a straight line, ophystogenetic;
   B) Straight line, orthogenetic, byprogenetic, ophystogenetic;
C) Straight line, medial, orthogenetic, byprogenetic;  
D) Distal, medial, direct, orthogenetic;  
E) Orthogenetic, deep, byprogenetic, ophystogenetic.  
9. **Mobility of a tooth in vestibule-oral directions belongs to:**  
A) I degrees;  
B) I - II degrees;  
C) III degrees;  
D) 0 degrees;  
E) II - III degrees.  

**Tasks for self-control to topic № 5**  
1. **What is depth of carious cavities at medium caries:**  
A) Within enamel;  
B) In limits of coat dentine;  
C) In limits of nearpulpal dentine;  
D) 1-2 mm.;  
E) To dentine-enamel borders.  
2. **What is depth of carious cavities at deep caries:**  
A) To dentine-enamel borders;  
B) In limits of coat dentine;  
C) In limits of nearpulpal dentine;  
D) In limits of interglobulare dentine;  
E) In limits of intertubulare dentine.  
3. **Probing at acute forms of pulpitis:**  
A) The painless;  
B) Poorly painful;  
C) Causes the sharp pain which at once is passing after elimination irritant;  
D) Causes a sharp pain which does not pass after elimination irritant;  
E) All answers true.  
4. **Occurrence of painful sensations at percussion testifies about:**  
A) Presence of inflammatory process in a pulp and a periodontium;  
B) Presence of inflammatory process in a periodontium;  
C) Presence of inflammatory process in paradontium tissues;  
D) Presence of demineralization firm tooth tissues;  
E) Defeat of nearpulpal dentine.  
5. **Painful at vertical percussion testifies to presence of inflammatory process:**  
A) In a pulp;  
B) In a top part of a periodontium;  
C) In marginal periodontium;  
D) In a pulp and a top part of periodontium;  
E) In a pulp and marginal periodontium.  
5. **Painful at horizontal percussion testifies to presence of inflammatory process:**  
A) In a pulp;  
B) In a top part of periodontium;  
C) In marginal periodontium;
D) In a pulp and a top part of periodontium;
E) In a pulp and marginal periodontium.

6. **For definition of a condition of gums, soft tissues of mucous membrane, sites of morbidity, consolidation, infiltrate, defect apply:**
A) Survey;
B) Percussion;
C) Interrogation;
D) Palpation;
E) Interrogation and survey.

7. **Reaction of what tissues does estimate at realization of a vertical percussion?**
   1. Enamel;
   2. Apical periodontium;
   3. Pulp;
   4. Cloak dentine;
   5. Regional periodontium;
   6. Nearpulpal dentine;
   7. Circular ligaments.

**Test task with a multiple choice of some correct answers**

1. **What sections from the listed sections of inspection does concern to the basic objective methods?**
   1. Palpation of lymphatic nodes;
   2. Finding - out of the complaints;
   3. Probing of a carious cavity;
   4. Percussion of a sick tooth;
   5. Collecting of an anamnesis of life;
   6. Survey of actually oral cavity;
   7. Survey of dentitions;
   8. Palpation of a mucosa of an oral cavity.

2. **What is estimated at realization of probing of a carious cavity?**
   1. Depth of a carious cavity;
   2. Condition of a periodontium;
   3. Condition of hard tissues of a tooth;
   4. Presence of communication of a carious cavity with oral cavity;
   5. Presence of pain points on dentin-enamel border, at the bottom of carious cavity;

   **A. The algorithm of practical skills**

<table>
<thead>
<tr>
<th>Main tasks</th>
<th>Indicatings to performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead objective inspection of the patient</td>
<td>Estimate: - colour of a skin, its integrity and cleanliness, humidity, elastance and turgor, - symmetry of the right and left half of face, - condition of seen mucosas of a nose, conjunctiva of the bottom blepharon, - condition of a skin of angles of a mouth, - condition of red border of labiums.</td>
</tr>
<tr>
<td>Examine the face.</td>
<td></td>
</tr>
<tr>
<td>Examine the lymph nodi.</td>
<td>Estimate the size, form, consistence, morbidity, connection with environmental tissues.</td>
</tr>
<tr>
<td><strong>Examine a vestibule of an oral cavity.</strong></td>
<td>Estimate: - depth of a vestibule, - attachment of bridles of the top and bottom labium, - parity of dentitions, - condition of a mucosa of labiums and cheeks: colour, turgor, degree of wetness, presence of elements a defeat, - condition of fine sialadens and their ductus, - condition of glands by Fordais, - condition of papillas of ductes of glandules parotide, - condition of a mucosa of an oral cavity (gingiva)</td>
</tr>
</tbody>
</table>
| **Lead inspection of a place of disease (Locus morbi)**
Examine the sick tooth:
survey, probing, percussion, palpation of a mucosa in the field of a tooth root apex projection | estimate: - colour, shine, - presence of seals, - presence of a carious cavity or defect of hard tissues of a tooth, - parity of the sizes of an inlet opening with a carious cavity: - condition of edges of enamel: colour, fragility; - colour of walls of a carious cavity (at a wide inlet opening).
Estimate: - at presence of seals - their functional and cosmetic full value, - depth of a carious cavity: - consistence of a dentine of bottom and walls of a carious cavity; - connection with a pulp cavity: in the field of horns of a pulp, wide connection; - presence of painfullity: on walls of a carious cavity in the field of dentine - enamel junction, on bottom;
Estimate a horizontal and vertical percussion for definition of a condition of a marginal and apical periodontium accordingly.
Estimate: - morbidity; - presence of an obvious hyperemia and edema; - presence of cicatrixes; - presence of fistulas, with the indicating of character of separated exudate. |

### 7. Recommended literature

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

Additional:

Information resources on the Internet:
- http://dental-ss.org.ua/load/kniga_stomatologija/terapevticheskaja8
- http://www.mosdental.ru/Pages/Page28.1.html
The methodical reference is made by the docent Marchenko I.Ya.
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 № 1</td>
<td>“Inspection of the stomatological patient with odontopathology”.</td>
</tr>
<tr>
<td><strong>Topic 6, 7</strong></td>
<td><strong>Auxiliary methods of inspection of the stomatological patient: thermodiagnostic, EOD, caries-marking: methodology of conducting, interpreting of results. X-ray, luminescent and transilluminating diagnostics: the indication to use, feature of realization. Diagnostic tests: with an anaesthesia and on the preparation. Procedure for determining trigger zones and examination of the exit sites of the trigeminal nerve peripheral branches. Laboratory examination methods. Interpretation of the results of analyzes of oral liquid, blood, urine, etc.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td>Stomatological</td>
</tr>
</tbody>
</table>
1. **Relevance of the topic:** the study of additional methods of inspection of the stomatological patient is necessary for specification and acknowledgement (confirmation) of the previous diagnosis of stomatological diseases. They will help the future doctor to distinguish not only odontopathology, but quite often diseases of other bodies and systems.

2. **Specific goals:**
   - To familiarize with additional tool and laboratory methods of inspection of the stomatological patient;
   - To understand the essence, the indications for the use of certain methods;
   - To be able to choose the necessary additional research method to clarify the diagnosis;
   - To be able to interpret the result of additional research methods.

3. **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>History of medicine</td>
<td>To know stages of growth of a domestic stomatology, ethical and deontological principles of job; To be able to use deontological principles and ethical norms at realization of inspection of the stomatological patient</td>
</tr>
<tr>
<td>Psychology</td>
<td>To know psychological problems, which arise at the patient during realization of stomatological manipulations; To be able to use the psychological approach at reception of the stomatological patient</td>
</tr>
<tr>
<td>Biophysics</td>
<td>To know features of job of electrodevices, safety precautions; To be able to use the safety precautions at job with stomatological installations, electrodevices</td>
</tr>
<tr>
<td>Internal illnesses</td>
<td>To know diseases of internal bodies, which have displays in an oral cavity; To be able to define interrelation between diseases of internal bodies and their displays in the oral cavity. To spend adequate treatment and prophylaxis.</td>
</tr>
<tr>
<td>Propedeutics of a therapeutic stomatology</td>
<td>To know stomatological toolkit: kinds, purpose, kinds of handpieces, burs, safety precautions regulation at job with them.</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>Additional methods of inspection</td>
<td>special research methods to clarify the preliminary diagnosis, specification of the form, stages, degree, current of disease, research of its etiology and pathogeny</td>
</tr>
<tr>
<td>Thermodiagnostic</td>
<td>Additional methods of inspection to determine the sensitivity of the pulp to thermal irritant</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>Electroodontodiagnostics</td>
<td>Additional methods of inspection to determine the sensitivity of the pulp to irritation by electric current</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>
</tr>
<tr>
<td>X-ray diagnostics</td>
<td>X-ray method of tooth examination with the help of Roentgen rays. which have the ability to penetrate soft tissues and linger in dense tissues</td>
</tr>
</tbody>
</table>

4.2. Theoretical questions to the lesson:

1. Indication to use and technique of realization of a thermodiagnostic;
2. Indication to use and technique of realization of EOD
3. Indication to use and technique of realization of caries - marking;
4. Indication to use and technique of realization of luminescent and transilluminating diagnostics;
5. Indication to use and technique of realization of X-ray method of inspection;
6. Indication to use and technique of realization of diagnostic test on preparation;
7. Indication to use and technique of realization of diagnostic test with an anaesthesia;
8. Technique of definition of trigeminal zones and inspections of places of an exit of peripheric branches of a trigeminal nerve;

4.3. **Practical work (tasks), which are performed at the lesson:**
1. Nominate, perform and interpret results of a thermodiagnostic;
2. Nominate, perform and interpret results of EOD;
3. Nominate, perform and interpret results of a caries - marking;
4. Nominate, perform and interpret results of luminescent and transilluminating diagnostics;
5. Nominate, perform and interpret results of X-ray method of inspection;
6. Nominate, perform and interpret results of diagnostic test on preparation;
7. Nominate, perform and interpret results of diagnostic test with an anaesthesia;
8. Perform inspection of trigeminal zones and places of an exit of peripheric branches of a trigeminal nerve;
9. To estimate results of laboratory methods of diagnostics: the general analysis of a blood, urine, analysis of a blood and urine on Saccharum.

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

   **Additional methods of inspection** are spent for specification of the form, stages, degree, current of disease, research of its etiology and pathogeny.

   For diagnostics of a caries, different forms of pulpites and periodontites, not carious defeats of teeth in addition spend:
   - Caries - marking, vital staining;
   - Thermodiagnostic;
• Electroodontodiagnostics (EOD);
• Luminescent diagnostics;
• Transilluminating diagnostics.
• The test on preparation (diagnostic preparation);
• The test with an anaesthesia;
• X-ray diagnostics, including a fistulography (to prove the indications);
• Inspection of an exit of peripheric branches of a trigeminal nerve;
• Definition of trigger zones;
• Definition of sensitivity in zones of innervation of a trigeminal nerve.

**Luminescent diagnostics**

Based on ability of tissues and their cellular elements under action of ultra-violet beams to change the natural colour. The researches spend in the blacked out premise(room) after acclimatization of an eye to darkness with the help of devices equipped with a quartz lamp with the filter from a dark - violet glass. In beams of Vud healthy teeth shine by a gentle - white shade, and the struck sites look more dark with precise contours.

**Transilluminating diagnostics**

With the help of the given method estimate of shade-making ability, which are observed at passage through object of research of a cold beam of light, harmless to an organism. The method can be used for diagnostics of a caries, pulpitis, cracks of enamel, lines of shrinkage of roots, control of preparation of cavities to sealing, applying of a seal, revealing and qualities of erosion of subgingival tooth adjournment.

The researches spend in a dark room with the help of a light guide from an organic glass attached to stomatological mirror.

At a caries - the hemisphere, circumscribed from healthy tissues, of brown colour is defined, at the acute forms of a pulpitis the crown of the struck tooth looks little bit those of crowns of healthy teeth, at chronic - the rather dim luminescence of hard tissues of a tooth (effect " of the dyd away star ") is observed, at a gangrenous pulpitis, at periodontites - blackout of all crown (effect " of a black hole ").
X-ray diagnostics

Most often intraoral contact roentgenography is used. A principle of a method based that the x-ray beams depending on density of a surveyed site to a greater or lesser extent linger over by tissues. In places, where on ways of beams there are hard tissues (mineralized - bone, enamel, dentine), will be a light site. In places, where absorption smaller, the beams reach a film and on a picture there will be a dark image. For achievement of the exactest image - exception of elongation or shortening of a tooth - it is desirable, that the tooth was in focus, and the central site of beams fell perpendicularly on object and film.

The enamel of a tooth gives a dense shadow, dentine and cement - less dense, than enamel. The pulp cavity is distinguished on outlines of a contour of a dentine, the periodontal cleft looks uniform more dark stria of width 0,2-0,25 mm, that formed by contours of an alveolus and cement of a root. The drawing of a bone is caused by presence in spongiform substance and in cortical layer of osteal beams or trabecules, between which there is an osteal brain. Maxilar sinus, the nasal meatus, orbit, frontal sinus are represented as the precisely outlined emptiness.

The test on preparation

Is used for definition of a condition of a pulp on sensitivity at diagnostic preparation. Is spent by way of preparation without a previous anaesthesia in the field of dentin-enamel border. In teeth with an alive pulp there is a pain with more or less expressed intensity, preparation of dead teeth - painless.

The test with an anaesthesia

At impossibility to define a sick tooth, which is a source of an acute pain, it is possible to lead intraligamental anesthesia serially of any "suspicious" tooth, entering no more than 0,25 ml of a solution of Anesthetic. As the given kind of an anaesthesia provides an anesthesia only of one tooth, the termination of a pain during 2-3 minutes can testify that sick is just anaesthetized tooth.

Thermodiagnostic

The intact tooth does not react by a pain to appreciable temperature deviations. Indifferent zone (the zone of absence of a pain reaction for lateral teeth makes from +
5-7°C up to +60-70 °C, for frontal teeth - from +12-17°C up to +50-52°C. At the acute forms of a caries indifferent zone is narrowed and there is in borders from +25°C up to +50°C. A thermodiagnostic by water with temperature above or below of indifferent zone causes acute or tedious, but quickly ending, pain. At pulpites the border of this zone are even more narrowed (deviation from temperature of a body on 5-7°C causes an attack of a pain). That is the indifferent zone at pulpites is in borders from 30 up to 40°C, and sometimes absolutely is absent. The thermodiagnostic thus provokes an attack of long nagging intensive or tedious pain. At periodontites (owing to destruction and disintegration of a pulp) thermal irritant does not cause the appropriate reaction of a tooth.

**EOD**

Approximate parameters of sensitivity of a pulp at EOD: a) an intact tooth - 2-6 мкА; b) a deep carious - 10-15 мкА; c) an acute pulpitis - 20-50 мкА; d) a chronic gangrenous pulpitis - 60-90 мкА; e) apical periodontitis - it is more than 100 мкА. 40 microamperes - this is the border between the return and the irreversibility of changes in the pulp.

**The caries-marking**

Dental markers - special dyes (2 % methylene blue, on the base of fuchsin) that paint over decay dentine to be extracted. Modern caries-markers can not only identify affected dentin and enamel, but also to determine which areas of affected dentin must be extracted fully, and which one can be restored using remineralized substances. At a caries - marking the drawing of solutions fast and exact (during 5-10 сек) shows the struck area, painting infected frame of a tooth. It permits to speed up and to simplify process of diagnostics, of preparation of carious tissues and to define volume of a bacterial penetration in a tissue of a tooth.

The following are normal complete blood count results for adults:

<table>
<thead>
<tr>
<th>Blood Component</th>
<th>Male:</th>
<th>Female:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red blood cell count</td>
<td>4.32-5.72 trillion cells/L*</td>
<td>3.90-5.03 trillion cells/L</td>
</tr>
<tr>
<td></td>
<td>(4.32-5.72 million cells/mcL**)</td>
<td>(3.90-5.03 million cells/mcL)</td>
</tr>
</tbody>
</table>

* - volume units: trillion; ** - concentration units: million
<table>
<thead>
<tr>
<th>Test</th>
<th>Male:</th>
<th>Female:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>13.5-17.5 grams/dL*** (135-175 grams/L)</td>
<td>12.0-15.5 grams/dL (120-155 grams/L)</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>38.8-50.0 percent</td>
<td>34.9-44.5 percent</td>
</tr>
<tr>
<td>White blood cell count</td>
<td>3.5-10.5 billion cells/L (3,500 to 10,500 cells/mcL)</td>
<td></td>
</tr>
<tr>
<td>Platelet count</td>
<td>150-450 billion/L (150,000 to 450,000/mcL**)</td>
<td></td>
</tr>
</tbody>
</table>

- * L = liter
- ** mcL = microliter
- *** dL = deciliter

6. Self-monitoring materials:
   A. Tasks for self-control to topic № 6

1. What does tooth tissue reacts on temperature irritant:
   A) Enamel;
   B) Dentine;
   C) Periodontium;
   D) Pulp;
   E) Enamel, dentine, pulp.

2. At thermodiagnosics the indifferent zone for a healthy lateral teeth makes:
   A) From +5 - 700 C to +60 - 700 C;
   B) From +10 - 150 C to +30 - 400 C;
   C) From +18 - 200 C to +30 - 350 C;
   D) From +180 C to +220 C;
   E) From +10 - 150 C to + 60 - 700 C.

3. At thermodiagnostics the indifferent zone for a healthy frontal teeth makes:
   A) From +5 - 700 C to +60 - 700 C;
   B) From +5-70 C to +30 - 370 C;
   C) From +180 C to +220 C;
   D) From +250 C to +370 C;
   E) From +12 - 170 C to +50 - 520 C.

4. An active electrode at carrying out EOD at incisors and canines put on:
   A) Equator;
   B) Tooth neck;
   C) Middle of cutting edge;
   D) Medial surface of a tooth;
   E) Gum in a projection of a tooth.root apex
5. An active electrode at carrying out EOD at premolars put on:
A) Equator;
B) Tooth neck;
C) Contact surfaces of tooth;
D) Gum in a projection of a tooth root apex;
C) Top of buccal casp.

6. Caries-finder it is:
A) Remineralization solution;
B) Dye;
C) Fluoric gel;
D) Anaesthetising solution;
E) Antiseptic solution.

7. Vital colouring use for diagnostics:
A) Caries and pulpitis;
B) Caries, pulpitis and periodontitis;
C) Pulpitis;
D) Periodontitis;
E) Caries.

8. For vital colourings use:
A) 2 % a solution an methulene dark blue;
B) 5 % spirit an iodine solution;
C) 1 % a solution iodinole;
D) 10 % a solution iodidy potassium;
E) permanganate potassium.

9. At acute forms of caries thermodiagnostic:
A) Causes a long pain;
B) Does not cause a pain;
C) Causes short-term pain;
D) Provokes a night pain;
E) Provokes irradiation pain.

10. Thermodiagnostics at a periodontitis:
A) The long pain provokes;
B) Causes short-term pain;
C) Provokes a night pain;
D) Does not cause a pain;
E) Causes a constant pain.

Tasks for self-control to topic № 7
1. At diagnostics of a pulpitis X-ray diagnostis is applied to definition:
A) Changes with pulp cells;
B) Changes with pulp blood vessels;
C) Present of concrements in a tooth cavity and root canals;
D) Presence an exudate in a pulp chamber and root canals;
E) Changes in surrounding bone.

2. At diagnostics of a periodontitis radiodiagnosis is applied to definition:
A) Changes with cellular elements of periodontium;
B) Presence exudate in periodontal space;
C) Changes with periodontium blood vessels;
D) Conditions of nearapex bone tissue;
E) Restorations in nearnecks sites.

3. **Definition of indicators of ohmic electric resistance of firm tissues of teeth use for definition:**
   A) Initial caries;
   B) Medium caries;
   C) Pulpitis;
   D) Periodontitis;
   E) Diseases of paradontium tissues.

4. **For an estimation of function of a trigeminal nerve define:**
   A) The biochemical analysis of blood;
   B) Symptom Lukomsky;
   C) Conjunctival reflex;
   D) Points by Valle;
   E) Immunography.

5. **At caries diagnostics roentgenography it is applied for:**
   A) Definitions of degree of passableness, curvature of the root canal;
   B) Quality assurance of sealing of the root canal;
   C) The control regional attachment of seals, restoration in nearneck sites;
   D) Condition of periodontal cracks;
   E) Definitions exudate in a tooth cavity.

6. **The test for preparation is used for definition:**
   A) Sites of enamels demineralization;
   B) Pulp conditions;
   C) Periodontium conditions;
   D) Consistens of dentine;
   E) Psychoemotional condition of the patient.

7. **The test with anaesthesia is used for definition:**
   A) Allergic reaction on anesthetic;
   B) Tooth viability;
   C) Psychoemotional condition of the patient;
   D) Causal tooth at irradiated pains;
   E) Causal tooth at the localised pain.

8. **At research of the clinical analysis of blood the quantity of leukocytes in norm makes:**
   A) 4,0-5,0 × 10⁹ l;
   B) 4,5-6,5 × 10⁹ l;
   C) 5,5-8,5 × 10⁹ l;
   D) 4,5-8,5 × 10⁹ l;
   E) 4,0-9,0 × 10⁹ l.

9. **At research of biochemical indicators of blood glucose contents in norm make:**
   A) 2,33-4,55 mmol/l;
   B) 3,33-5,55 mmol/l;
10. What tissue of a tooth does react at realization of a thermodiagnostic?
A) Enamel;
B) Tactile fibers of a periodontium;
C) Fiber by Ebner in a dentine;
D) Pulp of a tooth;
E) Cement;
F) Osteoclasts of an osteal tissue.

Test task with a multiple choice of some correct answers
Which of the listed methods of inspection do concern to additional objective methods?
1. EOD;
2. Finding - out of the complaints;
3. Probing of a carious cavity;
4. Percussion of a causal tooth;
5. Vital staining;
6. X-ray diagnostic;
7. Survey of dentitions;
8. Palpation of a mucosa of an oral cavity;
9. Luminescent and transilluminating diagnostics;
10. Thermodiagnostic.

5. 60-80 мкА.

Not typical tasks:
1. During inspection of the patient the student of the third course put the preliminary diagnosis: an acute partial pulpitis 12. For additional inspection the student has nominated X-ray method of research of the given tooth.

Whether a method of additional inspection is chosen correctly? What from additional methods of inspection, known for you, it was necessary to nominate for acknowledgement of the diagnosis?

2. At the patient with an acute general pulpitis owing to irradiation of the pains cannot be defined causal tooth.

What from auxiliary methods of inspection, known for you, can be used in this case?

3. During realization of EOD by the student of the third course the patient had acute pain at applying an active electrode on an active point of a researched tooth.

What gross blunder has admitted the student at realization of EOD?
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
The methodical reference is made by the Docent Marchenko I.Ya.
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 № 1</td>
<td>“ Inspection of the stomatological patient with odontopathology”.</td>
</tr>
</tbody>
</table>

| Topic 8 | Medical documentation of the therapeutic reception (form № 043/o, № 037/o, № 039-2/o) according to the order of the Ministry of Health № 110 from 14.02.12 ye. and № 527 from 28.07.2014 ye: rules for filling, registration of directions for additional research, etc. Medical card of dental patient - medical, scientific and legal document. |

| Course | III |
| Faculty | Stomatological |
1. **Relevance of the topic:** Knowledge of the records management, registration of the medical documentation of therapeutic reception provides the dentist with a dynamic observation of the development of the patient's illness, control over the course of the disease in the dynamics, the correctness and effectiveness of the prescribed and performed treatment. The medical card of the patient, in which the passport data is registered, the results of the patient's examination and treatment, even after a certain period of time, allow him to read the patient's medical history, taking into account the legal, scientific and medical aspects.

2. **Specific goals:** To fill in the medical documentation of the dental therapeutic reception, to appoint and write out directions of the patient for additional research.

   - To know:
     1. List of the necessary medical documentation on the dental reception.
     2. Medical, scientific and legal aspects of medical documentation on the dental reception.
     3. The rules for filling the medical card of a dental patient (form №043/o).

   - To be able:
     1. To complete the medical documentation, the medical card of the dental patient (form №043/o),
     2. To appoint write out the direction for additional research.

3. **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>1. Biophysics, computer science and medical equipment</td>
<td>Describe the therapeutic effect of physical devices on the human body, functional methods of research. write a referral to nat. procedures, additional methods of examination depending on physical. procedures.</td>
</tr>
<tr>
<td>2. Biological chemistry</td>
<td>To interpret laboratory and clinical-laboratory methods of research, biochemical parameters of blood, saliva. According to the indicators of clinical and laboratory studies evaluates the state of the organism.</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>Circuit of examination</td>
<td>Presentation, description of something in general terms, without details;</td>
</tr>
<tr>
<td>1. Form of primary accounting documentation №043/o.</td>
<td>1. &quot;Medical card of dental patient № ___&quot;</td>
</tr>
<tr>
<td>2. Form of primary accounting documentation №037/o;</td>
<td>2. &quot;List of the daily record of the dentist work (dental clinic, department, cabinet)&quot;.</td>
</tr>
<tr>
<td>3. Form of primary accounting documentation №039-2/o;</td>
<td>3. &quot;Diary of the account of the dentist work (dental clinic, department, cabinet)&quot;.</td>
</tr>
<tr>
<td>4. Form of № 030/o</td>
<td>&quot;Inspection card of dispensary supervision&quot;.</td>
</tr>
</tbody>
</table>

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

1. Name the forms of medical records that are completed on the dental therapeutic appointment.
2. Why is the medical card of a dental patient (f.043/o) an important document for medicine and science?

3. Why is the medical card of a dental patient (form №043/o) a legal document?

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

1. Perform a subjective and objective examination of the stomatological patient.
2. Fill in the medical card of the dental patient (form № 043/o).
3. Fill in the “List of the daily record of the dentist work (dental clinic, department, cabinet)”.
4. Fill out the ambulatory patient's ticket.
5. Fill in the "Diary of the account of the dentist work (dental clinic, department, cabinet)"
6. Fill the control card of the dispensary supervision from the patient (form № 030).
7. Write the direction to the X-ray examination.
8. Write directions for physiotherapeutic treatment
9. Write a direction to the laboratory for blood and urine tests.

5. The contents of the topic:

In Ukraine, there exists the Order of the Ministry of public health service of Ukraine "On Approval of Forms of Primary Accounting Documents and Instructions for their Filing Used in Health Care Institutions, Regardless of Form of Ownership and Subordination" № 110 from February 14, 2012.

In accordance with this order, the dentist on the therapeutic reception must fill in the following primary accounting documents:

1. Form of №043 / o "Medical card of dental patient № ___"
2. Form of №037 / o "List of the daily record of the dentist work (dental clinic, department, cabinet)"
3. Form of №039-2/o "Diary of the account of the dentist work (dental clinic, department, cabinet)"
4. Form of № 030/o "Inspection card of dispensary supervision".
Instruction

on filling in the form of the primary registration document N 043/о "Medical card of the dental patient N ___"

1. This Instruction determines the procedure for filling in the form of the primary accounting document N 043 / o "Medical card of the dental patient" (hereinafter - form N 043 / o).

2. Form N 043 / o is filled out by the responsible persons of ambulatory-polyclinic health care institutions that provide dental care to the population: dental clinics, dental offices and clinics of out-patient departments, clinics, hospitals, dispensaries, research institutes, higher educational establishments III - IV levels of accreditation, hospitals for war invalids, women's counseling, medical treatment points regardless of subordination and forms of ownership.

3. Passport data of the patient (last name, first name, patronymic, sex, place of residence, year of birth) are filled in by a medical sister or registrar.

4. Diagnosis and other sections of Form N 043/o are filled out by the attending physician directly. Depending on the complaints and the primary clinical diagnosis, the doctor should send the patient to laboratory examination, radiography, obtaining conclusions of experts of the corresponding profile, including general-somatic, with the submission of an extract from the card of the dental patient, analyzes and other medical documentation. The mentioned documentation shall be entered or pasted in the form N 043/o into the section "Data of X-ray examination, laboratory research".

4.1. Further clarification of the diagnosis, extension or even replacement with a mandatory indication of the date is allowed. The diagnosis should be deployed, only dental diseases should be described.

5. In line 6, "Complaints" from the words of the patient or relatives enter the complaints that most accurately reflect the patient's state of the dental disease.

6. Line 7 "Carried and related diseases" indicates the data on the transmitted and related diseases from the patient's words, as well as the data confirmed by specialists of other units of the health care institution. It is necessary to specify whether the patient is in the dispensary register and for what disease.

7. Line 8 "Development of the current disease" indicates: the time of occurrence of the first symptoms of this disease, which the patient associated with them, the nature of the course of the disease and previous treatment and its effectiveness.

8. In line 9 "Data of objective research, external examination, a state of teeth" a description of the external examination, which indicates the state of the skin, the bone skeleton of the face, the red border of the lips, etc., is described. In the given line the results of palpation of the temporomandibular joint, submandibular, parotid salivary glands are indicated. Recording of the oral examination data begins with the determination of the condition of hard tissues of teeth and periodontal tissue. The first row over schematically located teeth and below them is assigned to enter data
on the condition of the crown part of the tooth with symbols, including the presence of different designs of dentures.

8.1. The numerator shows the state at the time of the survey, in the denominator - the state after the treatment. Above the second row of schematically represented teeth and under it are entered the objective study of the state of periodontal, its norm (N), the degree of atrophy - 1/4, 1/2, 3/4 and the degree of mobility of teeth - I, II, III.

8.2. Under the table of schematically arranged teeth in writing, reflect additional data on the teeth, bone tissues of the alveolar sprouts (change in their shape, position, etc.).

9. In line 10 "Bite", the type of relationship between tooth rows is normal, with anomalies, pathological condition, as well as the nature of the relationship between the alveolar processes of the jaws in the absence of antagonistic teeth or their complete absence, focusing on their relationship in a state of relative rest.

10. The description of the condition of the mucous membrane of the oral cavity according to the visual inspection, the hygienic index (hereinafter - GI) and the papillary is made in line 11 "Condition of the hygiene of the oral cavity, the condition of the mucous membrane of the oral cavity, gums, alveolar sprouts and palate GI and PMA indices" - marginal alveolar index (hereinafter - PMA), which is an indicator for the evaluation of manifestations of gingivitis and periodontal index (RI), is aimed at the detection of advanced forms of pathology.

11. In line 12 "X-ray data, laboratory tests", it is necessary to mention the findings of X-ray examination and laboratory tests.

12. In line 13 "Color on a scale" Vita "indicate conformity of the color of the applied material to the color of the patient's crowns.

13. In line 14 "Date of training for oral hygiene skills", it is necessary to indicate the date when a conversation about the correct cleaning of the teeth and other oral hygiene skills was conducted.

14. In line 15 "Date of oral hygiene control" the date is given after the assessment of the oral hygiene state.

15. Section 16 "Doctor Diary" lists all cases of patient referral to a physician, an inspection plan, a patient's treatment plan with counseling notes.

**Instruction**

**on filling in the form of primary registration document N 037/o "List of the daily record of the dentist work (dental clinic, department, office)"

1. This Instruction determines the procedure for filling in the form of primary accounting documents N 037/o "A sheet of daily accounting of the work of a dentist (dental clinic, department, office)" (hereinafter - Form N 037 / o).

2. Form N 037 / o is filled daily by dentists and dental doctors who carry out ambulatory therapeutic, surgical and mixed admissions in health facilities and provide dental care to adults, adolescents and children.
3. Form N 037 / o is used to record the work performed by dentists and dentistry doctors within one working day of admission.
4. Box 1 indicates the serial number of the patient who applied for dental care or a healthy patient (for consultation, preventive examination). The data in this graph is used to record the total number of patients taken on a working day.
5. Box 2 records the time of admission (hours and minutes) for which the patient visits the doctor, or the time when the patient is taken from the reception desk or the examination room. These graphs are used to schedule the physician's work time, to distribute the load, taking into account the volume of treatment and prophylaxis.
6. In box 3, the last name, first name and patronymic of the patient are indicated.
7. In column 4, the number of full years is indicated.
8. In column 5, the serial number of the doctor's visit by the given patient (primary or repeated) is indicated.
8.1. Primary is considered the first application for dental care in the reporting year, regardless of the nature of the treatment. The initial call is indicated by the number 1, all subsequent visits are the corresponding digit.
9. Box 6 indicates the medical card number of the dental patient of the given patient.
10. Box 7 indicates the place of residence of the patient: a resident of a city, a village.
11. In column 8, the population groups indicated by the appropriate symbols are: decreed group - DG (children aged 0-14 and 15-17 years inclusive, invalids, pensioners, combatants, war invalids, war participants, persons who have suffered as a result of the Chernobyl disaster); schoolchildren - W; students - from; pregnant - in; industrial enterprises - R; persons of pre-preschool age - DPK.
12. If the given patient is on the dispensary account, the symbol "D" is supplemented.
13. Box 9 indicates the diagnosis for which the patient has requested a doctor. It is allowed to record with abbreviations using the conventional symbols and formula of teeth. In the presence of various diagnoses, all of them are indicated by the conditional marks in this column.
14. Box 10 indicates the details of the implementation of a comprehensive treatment or its stage. In this column, the physician uses a contraction, but legibly, to enter the actual amount of work performed. The abbreviation of the entry is made taking into account the names of the graph of the form of primary registration N 039-2 / o "Diary of the account of the work of a doctor-dentist (dental clinic, department, office)" approved by this order: sealed teeth for caries (temporary, permanent); clogged teeth over complicated caries, etc. In this column, the doctor indicates all the medical and preventive measures that he has taken during the period of dental plaque removal, remineralizing therapy, etc., as well as marks "previous-
ly sanovan", "teeth intact", "needs rehabilitation". In the absence of the patient at the scheduled time, the doctor in box 10 makes a mark "did not appear".

15. In column 11, the type of anesthesia is indicated: in the numerator - the local one, in the denominator - the general one.

16. Column 12 indicates the number of sanitized patients - all in the order of planned work and on appeals.

17. Box 13 indicates the number of sanitized patients with planned rehabilitation.

18. Box 14 indicates the number of waste OPS (according to the sectoral medical-economic standard, the classifier of procedures).

19. On the basis of the data form N 037 / o the form of initial registration N 039-2 / o "Diary of the account of the work of a doctor-dentist (dental clinic, department, cabinet)" is approved, this order is approved.

20. The control over the correctness of filling out the form N 037 / o is carried out by the head of the health care institution, which is directly subordinated to the doctor.

21. If the form N 037/o is kept in electronic format, all information contained in the approved paper medium must be included in it.

22. The term of storage of form N 037/o - 1 year after the reporting period.

**List of procedures on therapeutic stomatology**

Addition 1.1.14 to Order of MH of Ukraine from 28.12.2002 № 507

<table>
<thead>
<tr>
<th>Code of procedure</th>
<th>Name of procedure</th>
<th>Time for procedures (minutes)</th>
<th>Conditional labour Indicators (CLI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10.19</td>
<td>Primary examination of patient (includes the record of anamnesis, basic clinical inspections, plan of diagnostics and treatment)</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>1-10.19a</td>
<td>Examination of oral cavity, determination of stomatological status</td>
<td>24</td>
<td>1,5</td>
</tr>
<tr>
<td>1-12.19</td>
<td>Advice, if a patient addressed only for advice</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>1-13.19</td>
<td>Repeated examination of out-patient (includes the record of anamnesis, basic clinical methods of inspection, control of the appointed treatment)</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>1-16.19</td>
<td>Consultation of patient (record of examination and advice, information about the request of doctor which treats, by other doctor for the special estimation of the state and subsequent treatment)</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>1-10.19a</td>
<td>Complex primary inspection of patient, registration of registration document of the state of bite, periodontium, indexes of hygiene, PMA, CPE, local demineraiization, level of caries activity, plan of the health centre system, rehabilitation and prophylaxis</td>
<td>32</td>
<td>2,0</td>
</tr>
<tr>
<td>1-300</td>
<td>Stomatological examination during an ambulatory reception or prophylactic examinations, making plan of prophylaxis</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>1-300a</td>
<td>Block anaesthesiaing</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>1-300b</td>
<td>Infiltration anaesthesiaing</td>
<td>4</td>
<td>0,25</td>
</tr>
<tr>
<td>1-300c</td>
<td>Application anaesthesiaing</td>
<td>4</td>
<td>0,25</td>
</tr>
<tr>
<td>1-300.01</td>
<td>Examination of oral cavity and determination of hygienical index</td>
<td>16</td>
<td>1,0</td>
</tr>
<tr>
<td>1-300.05</td>
<td>Determination of hygienic index by Fedorov-Volodkina</td>
<td>8</td>
<td>0,5</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Price</td>
<td>Rate</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>1-300.05a</td>
<td>Determination of index by Green-Vermillion</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>1-304.01</td>
<td>Determination of pathological mobility of teeth</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>1-309.01</td>
<td>Electroodontodiagnostics</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>1-309.06</td>
<td>Analysis of local X-ray</td>
<td>5</td>
<td>0.25</td>
</tr>
<tr>
<td>1-309.07</td>
<td>Analysis of panoramic X-ray</td>
<td>10</td>
<td>0.5</td>
</tr>
<tr>
<td>1-809.02</td>
<td>Diagnostic use of staining substances</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>4-521.05</td>
<td>Removing of soft dental plaque from all teeth</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>4-521.01</td>
<td>Removing of calculus, plaque with instrumental method from all teeth</td>
<td>64</td>
<td>4.0</td>
</tr>
<tr>
<td>4-521.02</td>
<td>Removing of calculus, plaque by ultrasonic device from all teeth</td>
<td>48</td>
<td>3.0</td>
</tr>
<tr>
<td>4-521.06</td>
<td>Bleaching of teeth</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>4-539.01</td>
<td>Fluoridation of teeth</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>4-539.02</td>
<td>Sealing the fissures of one tooth by the sealer</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>4-539.04</td>
<td>Control of hygiene of oral cavity</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>5-232.01</td>
<td>Treatment of one tooth at a superficial and middle caries (without filling)</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>5-232.04</td>
<td>Treatment of one tooth at a deep caries without filling</td>
<td>20</td>
<td>1.25</td>
</tr>
<tr>
<td>5-232.07</td>
<td>Removing the defect of filling</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>5-232.12</td>
<td>Silvering of carious surface</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5-232.08</td>
<td>Applying of rubber dam</td>
<td>16</td>
<td>1.00</td>
</tr>
<tr>
<td>5-237</td>
<td>Treatment of pulpitis and apical periodontitis without filling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-237a</td>
<td>Preparation of carious cavity or (trepanation of crown, opening of pulp chamber)</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>5-237b</td>
<td>Applying of devitalizing paste and bandage</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5-237.01</td>
<td>Pulpectomy</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5-237.02</td>
<td>Extirpation of pulp from one root-canal</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5-237.04</td>
<td>Filling of one canal of tooth root by polymerized paste, cement</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>5-237.05</td>
<td>Filling of one canal of tooth root by polymerized paste and gutta-percha points (or by a thermoplastic)</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>5-237.09</td>
<td>Cover of perforation of root canal or perforation of bottom of pulp chamber</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>5-237.03</td>
<td>Instrumental and medicinal treatment of one root canal</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>5-237.20</td>
<td>Mechanical and chemical expansion of sclerotic root canal</td>
<td>32</td>
<td>2.0</td>
</tr>
<tr>
<td>5-249.02</td>
<td>Removing of filling material from the root-canal of tooth sealed by polymerized paste or by cement</td>
<td>48</td>
<td>3.0</td>
</tr>
<tr>
<td>5-249.09</td>
<td>Removing of fractured instrument from the root canal</td>
<td>64</td>
<td>4.0</td>
</tr>
<tr>
<td>5-249.10</td>
<td>Insertion of medical bandage at treatment of caries and its complications</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5-249.12</td>
<td>Insertion of permanent filling</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>5-232</td>
<td>Insertion of filling at treatment of caries and its complications:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-232.01</td>
<td>cement</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>5-232.06</td>
<td>composite material</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>5-232.05</td>
<td>amalgams</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>5-232.05a</td>
<td>amalgams with post-polishing of filling</td>
<td>16</td>
<td>1.0</td>
</tr>
<tr>
<td>5-232.08</td>
<td>Light-curing material</td>
<td>24</td>
<td>1.5</td>
</tr>
<tr>
<td>5-232.08a</td>
<td>Using of parapulpal posts for the improvement of fixing of the composite filling</td>
<td>16</td>
<td>1.0</td>
</tr>
<tr>
<td>5-232.09</td>
<td>Restoration of the destroyed crown of the one-root tooth with filling composite material</td>
<td>48</td>
<td>3.0</td>
</tr>
<tr>
<td>5-232.10</td>
<td>Restoration of the destroyed crown of the one-root tooth by wire core, metal posts and light-curing material</td>
<td>88</td>
<td>5.5</td>
</tr>
<tr>
<td>5-232.11</td>
<td>Restoration of the destroyed crown of the multi rooted tooth by wire core, metal post, plastic, composite material</td>
<td>80</td>
<td>5.0</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Price 1</td>
<td>Price 2</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>5-232.11a</td>
<td>Restoration of the destroyed crown of the multi rooted tooth by wire core, metal post, by light-curing material</td>
<td>104</td>
<td>6.5</td>
</tr>
<tr>
<td>8-190</td>
<td>Treatment of acute forms of stomatitis (AHS, ChRAS, candidiasis, traumatic lesions)</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>8-190.01</td>
<td>Treatment of periodontal diseases: applying of medical bandage on gum and in periodontal pockets (one visit)</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>8-190.02</td>
<td>Treatment of the wounds of oral mucosa, medical bandages (one visit)</td>
<td>12</td>
<td>0.75</td>
</tr>
<tr>
<td>8-190.03</td>
<td>Applying medical hardenings bandages on gums</td>
<td>24</td>
<td>1.5</td>
</tr>
<tr>
<td>5-929.03</td>
<td>Diathermocoagulation of gums</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>9-300.01</td>
<td>Insertion of the temporary filling</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>9-300.02</td>
<td>Remove of the temporary filling</td>
<td>4</td>
<td>0.25</td>
</tr>
</tbody>
</table>
Example of training record book filling in

<table>
<thead>
<tr>
<th>Date</th>
<th>Surname, name, age</th>
<th>Visiting</th>
<th>Subjective inspection: complaints, the disease anamnesis</th>
<th>Data of objective inspection</th>
<th>The diagnosis</th>
<th>Volume of the performed work: treatment stages, Prescription of remedy</th>
<th>Conditionall about Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.07. 2010</td>
<td>Omani Ali</td>
<td>1</td>
<td>Short-time toothache from chemical and thermal irritant in maxillary tooth on the left, hit and holdback of food (food lodgment); Causal tooth earlier was not treated, complaints occurred for 2-3 months.</td>
<td><strong>At survey</strong> – in 26 carious cavity in limits of cloak dentine is presented, with narrow entrance aperture with transparent, fragile enamel edges (easily break off by an excavator). A dentine of bottom and walls are light and softened. <strong>Probing</strong> is painfulness at enamel-dentin border. <strong>At vertical and horizontal percussion and palpation</strong> mucosa in range of apexes projection of tooth root is painless. <strong>At thermo diagnostic</strong>: inappreciable short-time painful sensitivity.</td>
<td>Acute middle caries 26</td>
<td>1. Anesthesia –Infiltrational anesthesiain area of 26 by 4% - 0,5 ml sol. Ubisthesini; 2. Mouth preparing (removal of a tooth plaque); 3. Preparation of caries cavity 26: a) disclosing, b) necrotomy, c) formation; 4. Washing and medicinal processing of caries cavities 2% sol. Chloramini; 5. Insertion of an isolating lining from Glass-ionomer cement(HeraeusKulzer); 6. Filling caries cavity by permanent material from chemical hardening composite material “Charisma”; 7. Polishing of filling. Advice about care of an oral cavity is given. Rp.: Sol. Ubisthesini4% - 1,7ml D.S. For anesthesia.</td>
<td>Examination 0,5; Anesthesia-0,5; Preparation 0,75; Insertionpermanent filling- 0,75; Advice- 0,5; Total: 3,0</td>
</tr>
</tbody>
</table>
Acute, spontaneous pain in area of mandibles molars on the right, irradiating in a corner of the bottom jaw, occipital area on the right. Attacks last about 1-2 hours, intermissions about 1 hour. Pain increases at night. Any irritants can provoke pain. Episodes of pain lasted for 3 days, their duration arose gradually, and «light intervals» became shorter.

**At survey:** in 47 – a deep carious cavity in limits of nearpulp dentine. A dentine of bottom and walls is less pigmented and softened. **At probing:** caries cavity is not connected with pulp chamber, acute pain is on all bottom. Vertical percussion is sensible, horizontal – painless. **Palpation** of mucosa in range of apexes projection of tooth root is painless. **Thermal diagnostic** – badly painful. **EOD:** 45 mA.

Vital extirpation - complete removing of pulp under anesthesia with subsequent filling of root canals and crown part of tooth.

**Stages of treatment:**
1. Anesthesia – Mandibularanesthesia on the right by 4% sol. Ubisthesini;
2. Isolation of working area;
3. Preparation of carious cavity 47;
4. Disclosing of pulp cavity 47;
5. Amputation of crown pulp;
6. Expansion of ostium of root canals;
7. Extirpating of root pulp;
8. Mechanical and medicinal processing of root canals: 1 distal and 2 medial; 3% hypochlorite of sodium (3-4 minutes) with technique “Step- back”;
9. Cotton turunda (roll) with phenol-camphorate is left in canals

Recommendations are made: not to eat during 2 hours, following visiting in 2 days.

**Rp.:** Sol. Natrii Hypochlorite 3 % - 50ml D.S. For antiseptic processing.
6. Self-monitoring materials:
A. Tasks for self-control
1. Occurrence of first signs of disease, character of a course bring treatment and its efficiency in the column of a card of the stomatological patient:
   A) Efficiency of treatment;
   B) Development of the true disease;
   C) Disease current;
   D) Diary;
   E) Complaints.
2. For a schematic designation of diseases and a condition of teeth in the tooth formula use:
   A) Diagnosis abbreviated notation;
   B) Letter designations;
   C) Latin names;
   D) Digital designations;
   E) Stomatologic designations.
3. The document in which register nameplate data, results of inspection and treatment of the stomatologic patient is called:
   A) Medical card;
   B) Medical card of the stomatologic patient;
   C) Out-patient card of the stomatologic patient;
   D) Out-patient card of the patient;
   E) Card of the stomatologic patient.
4. The first top jaw premolar at the left is designated:
   A) 14 tooth;
   B) 4
   C) 4;
   D) 24 tooth;
   E) 34 tooth.
5. Short accurate record about a condition of the patient and result of the spent treatment bring in the column of a card of the stomatologic patient:
   A) Disease current;
   B) Development of the true disease;
   C) Efficiency of treatment;
   D) Diary;
   E) Condition of the patient.
6. The central incisor of the top jaw on the right is designated:
   A) 1;
   B) 21 tooth;
   C) 11 tooth;
   D) 22 tooth
   E) 1.
7. In section of a medical card «Development of the true disease» write down:
   A) Labour anamnesis;
   B) Alergologycal anamnesis;
C) The transferred and accompanying diseases;
D) Tooth condition to occurrence of complaints;
E) Data about the transferred and accompanying diseases.

8. **The second bottom jaw molar at the left is designated:**
   A) 27 tooth;
   B) 37 tooth;
   C) 37 tooth;
   D) 47 tooth;
   E) 7.

9. **The first bottom jaw premolar on the right is designated:**
   A) 34 tooth;
   B) 44 tooth;
   C) 4 tooth;
   D) 4 tooth;
   E) 44 tooth

10. **The canine of the top jaw at the left is designated:**
    A) 13 tooth;
    B) 23 tooth;
    C) 3;
    D) 3;
    E) 33 tooth.

7. **Recommended literature**

   **Base:**
   2. Order of the Ministry of Health of Ukraine "On Approval of Forms of Primary Accounting Documentation and Instructions for their Filing Used in Health Care Facilities, Regardless of Form of Ownership and Subordination " No. 110 dated February 14, 2012.
The methodical reference is made by the docent MarchenkoI.Ya.
**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 № 1</td>
<td>“Inspection of the stomatological patient with odontopathoogy”.</td>
</tr>
<tr>
<td><strong>Topic 9</strong></td>
<td><strong>Hygiene of an oral cavity and its importance in the complex prevention of diseases of an oral cavity and organism as a whole. Microbial biofilm. The mechanism of formation. Structure, properties, composition of microflora. Methods for indicating microbial biofilms: staining. Definition of hygiene index by Fedorov-Volodkina, Green-Vermillion (standard and simplified techniques), index of oral hygiene efficiency (Podshadley, Haley).</strong></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 hygiene of an oral cavity has the large importance in prophylaxis of diseases of an oral cavity bodies and tissues and quite often diseases of other bodies and systems. Microbial biofilms are mainly implicated in etiopathogenesis of caries and periodontal disease. Owing to its properties, these pose great challenges. Continuous and regular disruption of these biofilms is imperative for prevention and management of oral diseases. This essay provides a detailed insight into properties, mechanisms of etiopathogenesis, detection and removal of these microbial biofilms. The professional hygiene of an oral cavity is obligatory practical manipulation of therapeutic reception.

2. **Specific goals:**
To familiarize with agents and methods of oral cavity hygiene, its importance for prophylaxis of diseases of oral cavity bodies and tissues, and also organism as a whole.

To know:
1) Classification of tooth debris;
2) Stages of dental plaque formation;
3) Structure, properties, composition of microflora, the mechanism of biofilms formation. Their etiological importance in occurrence of a caries and its complications, diseases of hard tooth tissues of periodontium.

To be able:
1) to nominate to the patient of an agent and methods of hygiene of an oral cavity.
2) to diagnose kinds of microbial biofilms.
3) to define the hygienic index by Fedorov-Volodkina. To give an estimation of the qualitative and quantitative characteristic.
4) to define the hygienic index by Green-Vermillion (standard and simplified techniques).

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

<table>
<thead>
<tr>
<th>Previous disciplines</th>
<th>Skills</th>
</tr>
</thead>
</table>
| **History of medicine** | To know stages of growth of a domestic stomatology, ethical and deontological principles of job;  
To be able to use deontological principles and ethical norms at realization of inspection of the stomatological patient |
| **Psychology** | To know psychological problems, which arise at the patient during realization of stomatological manipulations;  
To be able to use the psychological approach at reception of the stomatological patient |
| **Biophysics** | To know features of job of electrodevices, safety precautions;  
To be able to use the safety precautions at job with stomatological installations, electrodevices |
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>Subjects of hygiene</td>
<td>Tooth brushes: manual and electrical Interdental cleaning aids Dental floss Wooden tips Perio-aid Interdental brushes Rubber tip Oral irrigation devices</td>
</tr>
<tr>
<td>Agents of hygiene</td>
<td>Tooth pastas of different groups, powders, elixirs and others</td>
</tr>
<tr>
<td>Pellicle</td>
<td>is precipitation of saliva glycoproteins on enamel surface</td>
</tr>
<tr>
<td>Microbial biofilm</td>
<td>community of bacteria intimately associated with each other and included within an exopolymer matrix</td>
</tr>
<tr>
<td>Dental plaque</td>
<td>specific but highly variable structural entity consisting of microorganisms and their products embedded in a highly organized intercellular matrix.</td>
</tr>
<tr>
<td>Calculus or tartar</td>
<td>is a form of hardened dental plaque</td>
</tr>
</tbody>
</table>

4.2. Theoretical questions to the lesson:

1. Name subjects and agents of hygiene of an oral cavity. Give a substantiation of their purpose.
2. What is role of oral cavity hygiene in complex prophylaxis of a caries and its complications, diseases of periodontium?
5. Kind of microflora in dental plaque.
6. Definition of biofilms.
7. Classification of biofilms.
8. Structure, properties, composition of microflora of biofilms.
9. Mechanism of biofilms formation
10. Mechanism of increased antibiotic resistance in biofilms.
11. Definition of a hygienic index by Fedorov-Volodkina: qualitative and quantitative characteristic.
12. Definition of a hygienic index by Green-Vermillion (standard and simplified techniques).

4.3. Practical work (tasks), which are performed at the lesson:
1. Make a definition of a hygienic index by Fedorov-Volodkina. Evaluate the qualitative and quantitative characteristic.
2. Make a definition of a hygienic index by Green-Vermillion (standard and simplified techniques).
3. Make a definition and estimate of the index hygien efficiency.

5. The contents of the topic:

Hygiene of an oral cavity - individual, professional measures directed on elimination of risk factors of cariesgenic situation development. The tooth brushes, tooth thread (floss), irrigators, interdental rubber stimulators concern to subjects of hygiene. Tooth pastas of different groups, powders, elixirs concern to agents of hygiene.

Tooth deposits are divided on 2 groups:
– unmineralized (pellicula, debris, tooth plaque, pigmented debris (haemoglobin plaque, plaque of the smokers);
– mineralized (calculus above- and undergingival).

**Calculus or tartar** is a form of hardened dental plaque. It is caused by precipitation of minerals from saliva and gingival crevicular fluid (GCF) in plaque on the teeth. This process of precipitation kills the bacterial cells within dental plaque, but the rough and hardened surface that is formed provides an ideal surface for further plaque formation. This leads to calculus buildup, which compromises the health of the gingiva (gums). Calculus can form both along the gumline, where it is referred to as supragingival ("above the gum"), and within the narrow sulcus that exists between the teeth and the gingiva, where it is referred to as subgingival ("below the gum").

Calculus formation is associated with a number of clinical manifestations, including bad breath, receding gums and chronically inflamed gingiva. Brushing and flossing can remove plaque from which calculus forms; however, once formed, it is too hard (firmly attached) to be removed with a toothbrush. Calculus buildup can be removed with ultrasonic tools or dental hand instruments (such as a periodontal scaler).

**Stages of dental plaque formation**
1. Formation of pellicle is precipitation of saliva glycoproteins on enamel surface (thickness 1-10 mk. and forms after a half of an hour after teeth cleaning or hard meal).
2. Formation of soft dental debris. A layer of m/o is adsorbed on the surface of pellicle (especially Str’s) which in presence of sucharose synthesizes intra- and extracellular polysaccharides like dextrin. Intracellular dextrin is used as energy by m/o. Extracellular dextrin enhance adhesion of m/o to enamel and so increase thickness of soft dental debris.

3. Formation of dental plaque. After 3-4 days the debris consists of many m/o’s and has thickness 200 mk, hardly connected with surface of tooth. At this period, it has the most cariogenicizable ability. As a result of carbohydrates’ fermentation in dental plaque is formed lactic, propionic, acetic, pyroracemic, formic acids, which after certain concentration pick down locally (under plaque) pH to 4,5 – 5,0.

It causes dissolution of appetites in the least resistant parts of enamel (lines of Retsiuse, intraprysmaticale spaces) what leads to penetration by acids in under supersurfacial layer and its demineralization.

**Microbial biofilm** is defined as a community of bacteria intimately associated with each other and included within an exopolymer matrix: this biological unit exhibits its own properties, quite different in comparison with those showed by the single species in planktonic form. The oral cavity appears as an open ecosystem, with a dynamic balance between the entrance of microrganisms, colonisation modalities and host defences aimed to their removal: to avoid elimination, bacteria need to adhere to either hard dental surfaces or epithelial surfaces. The oral biofilm formation and development, and the inside selection of specific microrganisms have been correlated with the most common oral pathologies, such as dental caries, periodontal disease and peri-implantitis. Many of these bacteria are usual saprophytes of the oral environment, that, in particular situations, can overcome and express their virulence factors: to better understand the mechanisms of these pathologies it's necessary to know the complex interactions between all the bacterial species inside the biofilm and host tissues and responses. The present paper is a review of the most significant studies on the biofilm development modalities, their correlations with either health or illness of the oral cavity, the bacterial co-aggregation strategies and the biofilm response to antimicrobial agents.

Oral cavity is an open growth system with an uninterrupted introduction and removal of microbes and their nutrients. It offers diverse habitats where-in different species of micro-organisms can prosper. The primary requisite for any group of microbes to flourish in a niche is their ability to adhere to the tooth surfaces and multiply in shielded environments like periodontal pockets and tooth crevices. Such an aggregation of microbes on tooth surfaces has been traditionally referred to as ‘plaque’ because of its yellowish color, reminiscent of mucosal plaques caused by syphilis.

Dental plaque has been defined as “a specific but highly variable structural entity consisting of micro-organisms and their products embedded in a highly organized intercellular matrix.” It represents a true biofilm consisting of a variety of micro-organisms involved in a wide range of physical, metabolic and molecular interactions. The cooperative nature of a microbial community provides advantages to the participating organisms such as a broader habitat range for growth, enhanced resistance to antimicrobial agents and host defenses and enhanced pathogenicity.
Biofilms have been implicated as the chief culprit in the etiopathogenesis of dental caries and periodontal disease. Though uncalcified biofilms can be removed by routine oral hygiene aids or professional dental instruments, they have the potential to calcify into dental calculus making their removal difficult. Hence, these biofilms pose a great challenge to the dental clinician in the control and eradication of biofilm-associated diseases.

Historical perspective. Biofilms are nothing new. The first description dates back to the 17th century, when Anton Von Leeuwenhoek - the inventor of the Microscope, saw microbial aggregates (now known to be Biofilms) on scrapings of plaque from his teeth. The term ‘Biofilm’ was coined by Bill Costerton in 1978. In 2002, Donlan and Costerton offered the most salient description of a biofilm. They stated that biofilm is “a microbiologically derived sessile community characterized by cells that are irreversibly attached to a substratum or interface or to each other, embedded in a matrix of extracellular polymeric substances that they have produced, and exhibit an altered phenotype with respect to growth rate and gene transcription.”

The term Biofilm (Wilderer and Charaklis 1989) describes the relatively indefinable microbial community associated with a tooth surface or any other hard non-shedding material, randomly distributed in a shaped matrix or glycocalyx.

In the lower layers of a biofilm, microbes are bound together in a polysaccharide matrix with other organic and inorganic materials. Above it, is a loose amorphous layer extending into the surrounding medium. The fluid layer bordering the biofilm has stationary and dynamic sub layers.

**Classification of biofilms**

- On basis of its location
  1. *Supragingival* - Present coronal to the gingival margin
  2. *Subgingival* - Present apical to the gingival margin

- On basis of pathogenicity
  1. *Cariogenic* - Generally acidogenic and gram-positive
  2. *Periopathogenic* - Mostly basophilic and gram-negative

Supragingival biofilm is dental plaque that forms above the gums, and is the first kind of plaque to form after the brushing of the teeth. It commonly forms in between the teeth, in the pits and grooves of the teeth and along the gums. It is made up of mostly aerobic bacteria, meaning these bacteria need oxygen to survive. If plaque remains on the tooth for a longer period of time, anaerobic bacteria begin to grow in this plaque.

Subgingival biofilm is plaque that is located under the gums. It occurs after the formation of the supragingival biofilm by a downward growth of the bacteria from above the gums to below. This plaque is mostly made up of anaerobic bacteria, meaning that these bacteria will only survive if there is no oxygen. As this plaque attaches in a pocket under the gums, they are not exposed to oxygen in the mouth and will therefore thrive if not removed.

The extracellular matrix contains proteins, long-chain polysaccharides and lipids.

**Formation of a biofilm**
Formation of a biofilm is a complex process that follows several distinct phases, beginning with adsorption on to the tooth surface of a conditioning film derived from bacterial and host molecules, which forms immediately following tooth eruption or tooth cleaning. This adsorption is followed by passive transport of bacteria mediated by weak long-range forces of attraction. Covalent and hydrogen bonds create strong, short-range forces that result in irreversible attachment.

The primary colonizers form a biofilm by autoaggregation (attraction between same species) and coaggregation (attraction between different species). Coaggregation results in a functional organization of plaque bacteria and formation of different morphologic structures such as Corncobs and Rosettes. The microenvironment now changes from aerobic/capnophilic to facultative anaerobic. The attached bacteria multiply and secrete an extracellular matrix, which results in a mature mixed-population biofilm.

After one day, the term Biofilm is fully deserved because organization takes place within it. Transmission occurs from other sites, leading to incorporation of new members into the biofilm and the formation of a climax community. The thickness of the plaque increases slowly with time, increasing to 20 to 30 μm after three days.

Four stages of dental plaque biofilm growth (as shown in Figure 1):
Stage I - Attachment (lag - not inert, but metabolically reduced)
Stage II - Growth (log - exponential growth)
Stage III - Maturity (stationary)
Stage IV - Dispersal (death)

Microbiology of biofilms: plaque biofilm consists of different complexes of periodontal microorganisms which are based on the frequency with which microorganisms are recovered together. These complexes have been depicted in Figure 2.
Properties of biofilms: Biofilms are ubiquitous; they form on virtually all surfaces immersed in natural aqueous environments. A biofilm confers certain properties to bacteria that are not seen in the planktonic state, a fact that justifies recognition of dental plaque as a biofilm. A major advantage is the protection that biofilm provides to the colonizing species from competing micro-organisms, environmental factors such as host defense mechanisms and potentially toxic substances like lethal chemicals or antibiotics. Biofilms also facilitate processing and uptake of nutrients, cross feeding and removal of potentially harmful metabolic products through the voids or water channels between the micro-colonies, acting as a primitive circulatory system. They also create an appropriate physicochemical environment such as a properly reduced oxidation reduction potential. An important characteristic seen in Biofilm-associated bacteria is Quorum sensing, or cell density mediated gene expression. This involves the regulation of expression of specific genes through the accumulation of signaling compounds that mediate intercellular communication. Quorum sensing may give biofilms their distinct properties. Eg.- Expression of genes for antibiotic resistance at high cell densities may provide protection. It also has the potential to influence community structure by encouraging the growth of species beneficial to the biofilm and discouraging the growth of competitors. Another important characteristic of biofilm associated bacteria is the gene transfer through which bacteria communicates with each other. In *S. mutans*, quorum sensing is mediated by competence stimulating peptide, wherein genes are responsible for multiple functions - biofilm formation, competence and acid tolerance. Biofilm related Regulation of gene expression has been shown in certain bacteria. eg. Exposure of *S. gordonii* to saliva results in induction of genes that mediate host surface binding and coaggregation with *P. gingivalis* and *Actinomyces*. Similarly, genes encoding glucan and fructan synthesis are differentially regulated in Biofilm-associated *S. mutans*. 
Mechanism of increased antibiotic resistance in biofilms: organisms in a Biofilm are 1000-1500 times more resistant to antibiotics than in their planktonic state. The mechanisms of this increased resistance differ from species to species, antibiotic to antibiotic and for biofilms growing in different habitats. This antibiotic resistance in bacteria is thought to be affected by their nutritional status, growth rate, temperature, pH and prior exposure to sub-effective concentrations of antimicrobial agents. Another important mechanism appears to be the slower rate of growth of bacterial species in a biofilm, which makes them less susceptible to bactericidal antibiotics. Biofilm matrix can resist diffusion of antibiotics. Eg. strongly charged or chemically highly reactive agents can fail to reach the deeper zones of the biofilm as it acts as an ion exchanger in removing such molecules from solution. ‘Super-resistant’ bacteria have been identified within a biofilm, which have multidrug-resistance pumps that can extrude antimicrobial agents from the cell. Since these pumps place the antibiotics outside the outer membrane, the process offers protection against antibiotics that target cell wall synthesis. Above mentioned observations are critical to the use of antimicrobials in the treatment of Biofilm-associated infections.

Detection and assessment of biofilms: There are two main methods of detecting dental plaque in the oral cavity: through the application of a disclosing gel or tablet, and/or visually through observation. Plaque detection is usually detected clinically by plaque disclosing agents. Disclosing agents contain dye which turns bright red to indicate plaque build-up. Biofilms can only be revealed by staining with dyes – either basic fuschin or erythrosine. Two tone dyes contain FDC Red no.3 and FDC Green no.3, which stain immature and mature plaque respectively. Laser confocal microscopy is the latest method for plaque detection.

It is important for an individual to be aware of what to look for when doing a self-assessment for dental plaque. It is important to be aware that everyone has dental plaque, however, the severity of the build-up and the consequences of not removing the plaque can vary.

**Plaque disclosing gel**

Plaque disclosing gel: before (top) and after (bottom)

Plaque disclosing products, also known as disclosants, make plaque clinically visible. Clean surfaces of the teeth do not absorb the disclosant, only rough surfaces. Plaque disclosing gels can be either completed at home or in the dental clinic. Before using these at home or in the dental clinic check with your general practitioners for any
allergies to iodine, food colouring or any other ingredients that may be present in these products. These gels provide a visual aid in assessing plaque biofilm presence and can also show the maturity of the dental plaque.

**Disclosing tablets**

Disclosing dental plaque with disclosing tablets
Disclosing tablets are similar to that of disclosing gels, except that they are placed in the mouth and chewed on for approximately one minute. The remaining tablet or saliva is then spit out. Disclosing gels will show the presence of the plaque, but will often not show the level of maturity of the plaque. Disclosing tablets are often prescribed or given to patients with orthodontic appliances for use before and after tooth brushing to ensure optimal cleaning. These are also helpful educational tools for young children or patients that are struggling to remove dental plaque in certain areas. Disclosing gels and tablets are useful for individuals of all ages in ensuring efficient dental plaque removal.

**Visual or tactile detection**
Dental biofilm begins to form on the tooth only minutes after brushing. It can be difficult to see dental plaque on the hard tissue surfaces, however it can be felt as a rough surface. It is often felt as a thick, fur-like deposit that may present as a yellow, tan or brown stain. These deposits are commonly found on teeth or dental appliances such as orthodontic brackets. The most common way dental plaque is assessed is through dental assessment in the dental clinic where dental instruments are able to scrape up some plaque. The most common areas where patients find plaque are between the teeth and along the cervical margins.

Criteria utilized in the assessment of Dental Biofilm: (Ribeiro *et al*. 1999):

0 – No visible biofilm
1 – Thin biofilm only on anterior teeth
2 – Easily removed thin biofilm distributed on anterior and posterior teeth
3 – Firmly adhered thick biofilm only on anterior or posterior teeth
4 – Firmly adhered thick biofilm on anterior teeth and thin biofilm on posterior teeth, or firmly adhered thick biofilm on posterior teeth and thin biofilm on anterior teeth
5 – Firmly adhered thick biofilm on anterior and posterior teeth

**Estimation of a hygienic condition of an oral cavity.**
Is spent by definition of an objective parameter (index), that characterizes quality and quantity of tooth debris.

**Definition of an index of hygiene of an oral cavity by Fedorov-Volodkina (1971).**
Is spend by greasing of vestibular surfaces of six bottom frontal teeth by a solution by Shiller-Pisarev (Iodum crystalline 1,0; Iodidum of potassium 2,0; distilled water 40,0).

Quantitative estimation spend depending on the area of a staining on a five-mark scale:

<table>
<thead>
<tr>
<th>Mark</th>
<th>Staining result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No colouring</td>
</tr>
<tr>
<td>2</td>
<td>colouring of 1/4 surfaces of a crown</td>
</tr>
<tr>
<td>3</td>
<td>colouring of 1/2 surfaces of a crown</td>
</tr>
<tr>
<td>4</td>
<td>colouring of 3/4 surfaces of a crown</td>
</tr>
<tr>
<td>5</td>
<td>colouring of all surface of a crown</td>
</tr>
</tbody>
</table>

Qualitative estimation spend on intensity of a staining of the same teeth by 3-mark systems:

<table>
<thead>
<tr>
<th>Mark</th>
<th>Staining result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Light yellow colour</td>
</tr>
<tr>
<td>2</td>
<td>Yellow - brown</td>
</tr>
<tr>
<td>3</td>
<td>Intensive - brown</td>
</tr>
</tbody>
</table>

Account of average meaning of an index conduct under the formula:

\[ HI = \frac{\sum \text{mark of 6 teeth}}{n}, \]

where \( HI \) – hygiene index, \( \sum \) – the sum of the hygiene result of 6 teeth, \( n \) – quantity of researched teeth.

Interpreting of results:

<table>
<thead>
<tr>
<th>Result of an index</th>
<th>Level of hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 - 1.5</td>
<td>Good</td>
</tr>
<tr>
<td>1.6-2.0</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>2.1-2.5</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>2.6-3.4</td>
<td>Bad</td>
</tr>
<tr>
<td>3.5-5.0</td>
<td>Very bad</td>
</tr>
</tbody>
</table>

Green, J.R.Vermillion have offered a standard index of hygiene of an oral cavity. For its definition spend a staining of 6 teeth:

16,11,26,31 - vestibular surface;
36,46 - lingual surfaces.

Codes and criterion of an estimation of a debris:

0 - the debris is not revealed;
1 - a soft debris, which covers no more than 1/3 surfaces of a tooth;
2 - a soft debris, which covers more than 1/3, but less than 2/3 surfaces of a tooth;
3 - a soft debris, which covers more than 2/3 surfaces of a tooth.

The account of an index of a debris is spent by summation of meanings of 6 teeth and calculations average arithmetic: \[ HI = \frac{\sum \text{Parameters of 6 teeth}}{6}. \]

Interpretating of HI results:
The simplified index of hygiene of an oral cavity
(OHI-S, G.C.Green, J.R.Vermillion 1964)

It consists of two components: an index of debris and index of an odontolith. The index of debris is defined the same as at a standard method, index of an odontolith - on the same teeth and surfaces, using the following system of estimations:

**Codes and criterion of an estimation of an odontolith:**
0 - the odontolith is not revealed;
1 - overgingival odontolith, which covers 1/3 surfaces of a tooth;
2 - overgingival odontolith, which covers more than 1/3, but less than 2/3 surfaces of a tooth or presence of separate debris of undergingival odontolith in the neck area of a tooth;
3 - overgingival odontolith, which covers more than 2/3 surfaces of a tooth or appreciable debris of undergingival odontolith around of neck area of a tooth.

The account of an index is spent by the formula:

\[
\text{OHI-S} = \frac{\text{the sum of indexes of a debris}}{\text{quantity of surfaces}} + \frac{\text{sum of an index of an odontolith}}{\text{quantity of surfaces}}
\]

<table>
<thead>
<tr>
<th>OHI-S</th>
<th>Level of hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,0-0,6</td>
<td>Good</td>
</tr>
<tr>
<td>0,7-1,8</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>1,9-3,0</td>
<td>Bad</td>
</tr>
</tbody>
</table>

Index of efficiency of hygiene of an oral cavity (Podshadley, Haley (1968))

For a quantitative estimation of a debris use a staining of 6 teeth:
16,26,11,31 - vestibular surface;
36, 46 - lingual surfaces.

At absence of an index tooth it is possible to survey next, but in the field of the same group of teeth. Artificial crowns and the parts of fixed designs of prostheses survey how also teeth. The surveyed surface of each tooth is conditionally divided into 5 parts.

![Conditional division of a surface of a tooth at definition of an index of efficiency of hygiene](image)

1 - medial; 4 - central;
2 - distal; 5 - medial-occlusial.
3 - medial-nearneck;

Codes and criterion of an estimation of a debris:
0 - absence of a staining; 1 - the stainings are revealed.
The account is spent, defining a code for each tooth by summation of codes of each site. Then summarize codes of all surveyed teeth also divide the received sum into number of teeth.

An index expect under the following formula:
IHE = the sum of codes of all teeth / Quantity of the surveyed teeth

<table>
<thead>
<tr>
<th>Size of IHE</th>
<th>Efficiency of hygiene</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Excellent</td>
</tr>
<tr>
<td>0,1-0,6</td>
<td>Good</td>
</tr>
<tr>
<td>0,7-1,6</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>1,7 and large</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>

6. Self-monitoring materials:

A. Tasks for self-control
1. Water procedures in the form of rinsings, trays name:
   A) Brashing;
   B) Washing;
   C) Flossing;
   D) Irrigation
   E) Hygiene of an oral cavity.
2. Mechanical clarification a teeth fissures, implants, tongue name:
   A) Brashing;
   B) Washing;
   C) Flossing;
   D) Irrigation;
   E) Hygiene of an oral cavity.
3. Clarification of intertooth intervals, contact surfaces of the next teeth, intertooth papilla name:
   A) Washing;
   B) Brashing;
   C) Flossing;
   D) Irrigation;
   E) Hygiene of an oral cavity.
4. Procedure of clarification of an oral cavity, a teeth by means of an irrigator or a hydromasseur is called:
   A) Washing;
   B) Brashing;
   C) Flossing;
   D) Irrigation;
   E) Hygiene of an oral cavity.
5. For definition of hygiene index of an oral cavity by Green-Vermilion lead colouring:
   A) 321 | 123;
   B) 321 | 123;
6. Quantitative estimation HI by Fedorov-Volodkina makes 1,4. It is hygiene level:
A) The good;
B) The satisfactory;
C) The unsatisfactory;
D) The bad;
E) Very bad.

7. The standard index of hygiene of an oral cavity by Green-Vermilion makes 1,5. It is hygiene level:
A) The good;
B) The bad;
C) The satisfactory;
D) The unsatisfactory;
E) Very bad.

8. Quantitative estimation HI by Fedorov-Volodkinoj makes 2,3. It is hygiene level:
A) The good;
B) The satisfactory;
C) The unsatisfactory;
D) The bad;
E) Very bad.

9. The basic subjects of care of an oral cavity is:
A) Tooth-brushes;
B) Floss;
C) Toothpicks;
D) Intertooth stimulators and irrigators;
E) All answers true.

10. An index of efficiency of hygiene of an oral cavity 1,8. It testifies, that efficiency of hygiene:
A) The excellent;
B) The good;
C) The satisfactory;
D) The unsatisfactory;
E) The bad.

11. How much and what teeth are painted during definition of HI by Fedorov-Volodkina?
A) 4 frontal teeth of the top jaw
B) 5 frontal teeth of a mandible
C) 8 frontal teeth of the top jaw
D) 6 frontal teeth of a mandible
E) 2 central incisors and 4 molars

12. What teeth and on what surfaces are subject to a staining during definition of HI by Green-Vermillion?
A) 16,11,26,31 - vestibular surfaces, 36,46 - lingual surfaces
B) 31,32,33, 41,42,43 - vestibular surface
C) 11,12, 21,22 - vestibular surface, 36,46, - lingual surfaces
D) 31,32,33, 41,42,43 - oral surfaces
B. Not typical tasks:

1) Before realization of definition of a hygienic index on a technique by Fedorov-Volodkina student has processed vestibular surfaces of the bottom frontal teeth by a solution of a peroxide of Hydrogenium with the help of a wadded globule and has dried up surfaces of teeth by a jet of air. Whether the real parameter of HI will be received? What a mistake is there?

2) After realization of professional hygiene of an oral cavity the student spent definition of its efficiency by Podshadley, Haley (1968), but 36, 46 teeth was absent. What in such case we must to do?

3) The patient N., at which half-year back generalized parodontitis is diagnosed, repeatedly complains on bleeding of gingiva, pain at reception of nutrition. The patient independently spends a gargle of an oral cavity by a solution "Ротокан" and cleans teeth by bleaching Pasta Colgate. Whether these measures in this case are proved? What purposes should be made to the patient?

7. Recommended literature

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

Additional:

**Information resources on the Internet:**
- http://dental-ss.org.ua/load/kniga_stomatologiya/terapevticheskaja/8
- http://www.mosdental.ru/Pages/Page28.1.html
The methodical reference is made by the docent Marchenko I.Ya.
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 № 1</td>
<td>“Inspection of the stomatological patient with odontopathology”.</td>
</tr>
<tr>
<td><strong>Topic 10</strong></td>
<td>Methods of dental deposits removing: manual, hardware (sound, ultrasonic), air-abrasive, combined. Chemical control of biofilm. Algorithm of the oral cavity professional hygiene.</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:** Microbial biofilms are mainly implicated in etiopathogenesis of caries and periodontal disease. Owing to its properties, these pose great challenges. Continuous and regular disruption of these biofilms is imperative for prevention and management of oral diseases. This essay provides a detailed insight into properties, mechanisms of etiopathogenesis, detection and removal of these microbial biofilms. The professional hygiene of an oral cavity is obligatory practical manipulation of therapeutic reception.

2. **Specific goals:**

   Get to know the concept of professional hygiene of an oral cavity, methods of removing dental deposits.

   To know:
   1. Possible strategies to control oral biofilms;
   2. Manual tools and the rules of their work for dental deposits removing;
   3. Hardware (electric) method for dental deposits removing.

   To be able:
   1. Choose the different techniques of dental deposits removing according to their kind.
   2. To perform professional hygiene of an oral cavity.
   3. To perform removing of dental deposits (tissue-associated biofilms) by manual means (gingival curettage).

3. **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>History of medicine</td>
<td>To know stages of growth of a domestic stomatology, ethical and deontological principles of job; To be able to use deontological principles and ethical norms at realization of inspection of the stomatological patient</td>
</tr>
<tr>
<td>Psychology</td>
<td>To know psychological problems, which arise at the patient during realization of stomatological manipulations; To be able to use the psychological approach at recep-</td>
</tr>
<tr>
<td>Course</td>
<td>Objectives</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Biophysics</strong></td>
<td>To know features of job of electrodevices, safety precautions; To be able to use the safety precautions at job with stomatological installations, electrodevices.</td>
</tr>
<tr>
<td><strong>Internal illnesses</strong></td>
<td>To know diseases of internal bodies, which have displays in an oral cavity; To be able to define interrelation between diseases of internal bodies and their displays in the oral cavity. To spend adequate treatment and prophylaxis.</td>
</tr>
<tr>
<td><strong>Propedeutics of a therapeutic stomatology</strong></td>
<td>To know stomatological toolkit: kinds, purpose, kinds of handpieces, burs, safety precautions regulation at job with them.</td>
</tr>
<tr>
<td><strong>Therapeutic stomatology</strong></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>Biofilms</td>
<td>are defined as a community of microorganisms that are attached to a surface, or a group of microorganisms themselves forming microbial aggregates, that are encased within an extracellular matrix (ECM) of polysaccharides, proteins, and glycoproteins, referred to as the extracellular polymeric substance (EPS).</td>
</tr>
<tr>
<td>Dental plaque</td>
<td>specific but highly variable structural entity consisting of microorganisms and their products embedded in a highly organized intercellular matrix.</td>
</tr>
<tr>
<td>Air-abrasive methods of dental deposits removing</td>
<td>Removing of Tissue-associated Biofilms by Air – abrasive (powder-flow) devices</td>
</tr>
<tr>
<td>Hardware method of dental deposits removing</td>
<td>Removing of Calculus-associated Biofilm by Scaling and Root planing (sound, ultrasonic).</td>
</tr>
</tbody>
</table>
4.2 Theoretical questions to the lesson:
1. Name the possible strategies to control oral biofilms.
2. Clinical approaches to mechanical plaque control
3. Clinical approaches to chemical plaque control
4. Methods of individual teeth cleaning
5. Concept of professional hygiene of oral cavity
6. Instruments for manual removing of dental plaque
7. Chemical method for dental plaque removing
8. Apparatus (sound, ultrasonic) method removing of dental plaque
9. Kind, mechanism of action, advantages of ultrasonic device for dental plaque removing

4.3. Practical work (tasks), which are performed at the lesson:
1. Make a patient's training on individual hygiene of the oral cavity.

5. The contents of the topic:
Treatment of microbial biofilms. As with other branches of dentistry, there is no ‘cook book’ approach that works for every site in every patient. Individual considerations must be taken care of, while treatment planning. No matter what, biofilm control is fundamental to the maintenance of oral health and to the prevention of dental caries, gingivitis and periodontitis.

Possible strategies to control oral biofilms:
- Inhibition of bacterial colonization
- Inhibition of bacterial growth and metabolism
- Disruption of established plaque
- Modification of plaque biochemistry
- Alteration of plaque ecology

Clinical approaches
- Mechanical plaque control
  - Tooth brushes
    - Manual
    - Electrical
  - Interdental cleaning aids
  - Dental floss
  - Wooden tips
  - Perio-aid
  - Interdental brushes
  - Rubber tip
  - Oral irrigation devices
- Chemical plaque control
  - Enzymes
    - Mucinase
    - Dehydrated pancrease
    - Lactoperoxidase hypothiocyanate
  - Antibiotics
    - Penicillin
    - Vancomycin
    - Erythromycin
  - Phenols
    - Thymol
    - Delmopinol
  - Quaternary ammonium compounds
    - Benzalkonium chloride
    - Cetylpyridinium chloride
  - Bisbiguanides
    - Chlorhexidine
    - Alexidine
  - Bispyridines
    - Octenidine
  - Metallic salts
    - Zinc
    - Tin
    - Copper
  - Herbal extracts
    - Sanguinarine
  - Amino alchohols
    - Octapenol
    - Decapenol
  - Other surfactants
    - Sodium lauryl sulphate
- Professional oral prophylaxis
  - Calculus-associated Biofilm can effectively be removed by Scaling and Root planing and Tissue-associated Biofilms by Gingival Curettage.

**The methods of individual teeth cleaning**

**Method by Charter:** the tooth brush is established under an angle of 45 degrees to a gingiva. The movements are circular, vibrating, that bristles have penetrated into interdental intervals. The method is recommended for massage of a gingiva after a course of treatment of gingivitis, parodontitis.

**Standard method by Pahomov:** conditionally each jaw is divided into 6 segments - two frontal, premolars, molars, on the right and at the left. All surfaces (chewing, vestibular, oral) clear not less than 10 didymous movements of a brush. Only 400-500 didymous movements. Time of cleaning till 3.5-4 min. 2 times in a day. Movements of a brush on vestibular and oral surfaces are sweeping, on chewing - reciprocating and circular.
Advices for the patient:
- To prevent plaque buildup, brush your teeth at least twice a day with a soft, rounded-tip bristled toothbrush. Pay particular attention to the space where the gums and teeth meet. Use a fluoride-containing toothpaste.
- Use floss between teeth at least once a day to remove food particles and bacteria.
- Use an antibacterial mouth rinse to reduce bacteria that cause plaque and gum disease.
- See your dentist or oral hygienist every 6 months for a check-up and teeth cleaning.
- Ask your dentist if a dental sealant is appropriate for you. Dental sealants are a thin, plastic coating that are painted on the chewing surfaces of teeth to protect them from cavities and decay.
  - Eat a balanced diet and limit the number of between-meal snacks. If you need a snack, choose nutritious foods such as plain yogurt, cheese, fruit, or raw vegetables. Vegetables, such as celery, help remove food and help saliva neutralize plaque-causing acids.

**Main stages of professional hygiene:**
- Performing conversation with patient about required professional hygiene of oral cavity;
- Teaching the patient for oral hygiene rules;
- Performing the procedure of professional oral hygiene;
- Removing of all dental deposits and performing of curettage;
- Finishing and polishing of crown and root surfaces.

**Scaling and root planing**
An important part of the scope of practice of a dental hygienist is the removal of plaque and calculus deposits. This is achieved through the use of specifically designed instruments for debridement of tooth surfaces. Treatment with these types of instruments is necessary as calculus deposits cannot be removed by brushing or flossing alone. To effectively manage disease or maintain oral health, thorough removal of calculus deposits should be completed at frequent intervals. The recommended frequency of dental hygiene treatment can be made by a registered professional, and is dependent on individual patient needs. Factors that are taken into consideration include an individual's overall health status, tobacco use, amount of calculus present, and adherence to a professionally recommended home care routine.

**There are several methods for professional dental plaque removing:**
1) manual (with the help of hand tools - Grace curettes, Gingival trimmers, spoon excavator, set of Zaks hooks);
2) chemical (with the help of gels containing acids - citric, lactic, EDTA);
3) apparatus (sound, ultrasonic, air-abrasive);
4) combined.

**Physical apparatus method** of removing of dental deposits:
- Air – abrasive (powder-flow) devices;
- Low-frequency sonic scalers (pneumoscalers);
• Magnetostrictious ultrasonic scalers;
• Piezo-electric (piezo-ceramic) scalers;
• System Vector

Hand instruments are specially designed tools used by dental professionals to remove plaque and calculus deposits that have formed on the teeth. These tools include scalers, curettes, jaquettes, hoes, files and chisels. Each type of tool is designed to be used in specific areas of the mouth. Some commonly used instruments include sickle scalers which are designed with a pointed tip and are mainly used supragingivally. Curettes are mainly used to remove subgingival calculus, smooth root surfaces and to clean out periodontal pockets. Curettes can be divided into two subgroups: universals and area specific instruments. Universal curettes can be used in multiple areas, while area specific instruments are designed for select tooth surfaces. Gracey curettes are a popular type of area specific curettes. Due to their design, area specific curettes allow for better adaptation to the root surface and can be slightly more effective than universals. Hoes, chisels, and files are less widely used than scalers and curettes. These are beneficial when removing large amounts of calculus or tenacious calculus that cannot be removed with a curette or scaler alone. Chisels and hoes are used to remove bands of calculus, whereas files are used to crush burnished or tenacious calculus.

For hand instrumentation to be effective and efficient, it is important for clinicians to ensure that the instruments being used are sharp. It is also important for the clinician to understand the design of the hand instruments to be able to adapt them properly.


Chemical method of removing of soft and mineralized dental deposits:
- Perform application of 50% organic acids for 20-30 min. with the aim of softening of dental calculus;
- Gargling of oral cavity with 2% sodium bicarbonate sol. (feeding soda);
- Perform remineralizing therapy

Main benefits for removing of dental deposits with sonic and ultrasonic devices:
✓ Reduction of dentist’s working time;
✓ Maximum cleaning of periodontal pockets;
✓ Reduction of microflora in periodontal pockets for 25%;
✓ Relative painless procedures;
✓ Comfort for the patient

Main disadvantages of removing of dental deposits with sonic and ultrasonic devices:
✓ Appearance of aerosol cloud, containing the big amount of microorganisms;
✓ Risk of dentist and assistant infection;
✓ Risk of injury of hard teeth tissues and pulp, also soft tissues with wrong using of devices;
✓ Required frequent changing of dental mask;
✓ Presence of contra-indication for using of sonic and ultrasonic scalers:

**Contraindications to the use of ultrasound and sound scalers:**
- Implanted pacemaker,
- Localized osteomyelitis,
- Malignant neoplasms,
- Carrying out in patients immunosuppressive and corticosteroid therapy,
- In patients who underwent surgical treatment of the retina (only after consulting with an ophthalmologist),
- Violation of nasal breathing (acute and chronic),
- Acute and chronic infectious diseases,
- Severe form of diabetes mellitus,
- Epilepsy,
- Defects of soft tissues of the oral cavity (erosion, ulcers, cracks, etc.),
- Children with baby teeth or newly erupted permanent teeth.

Regarding the removal of dental plaque with the help of electric instruments, pregnant women have no common opinion.

When removing dental deposits, water cooling is necessary to avoid thermal damage to the pulp of the tooth. When studying in vitro, it was found that without water cooling, it is possible to heat hard tooth tissues to 200 ° C. In modern electrical scalers, sterile antiseptic solutions can be used instead of water to cool the nozzle and irrigate the surface to be treated. This allows them to be used for surgical operations on periodontal tissues.

Depending on the manufacturer's company and the year of manufacture, the water is either factory-adjusted or manually adjusted - the handle on the instrument panel, the force of pressing the pedal of the scaler or the dental unit, in modern scalers, the adjustment is made using the button on the tip.

**Working guide for using of sonic and ultrasonic scalers:**
- Do not use device without water supply;
- Perform procedures without excessive pressure;
- Do not put sharp end of tip athwart the tooth axis;
- Necessary to use protection glasses, mask, gloves.

Ultrasonic scalers, also known as power scalers, are effective in removing calculus, stain, and plaque. These scalers are also useful for root planing, curettage, and surgical debridement. Not only is tenacious calculus and stain removed more effectively with ultrasonic scalers than with hand instrumentation alone, it is evident that the most satisfactory clinical results are when ultrasonics are used in adjunct to hand instrumentation. There are two types of ultrasonic scalers; piezoelectric and magnetostrictive. Oscillating material in both of these handpieces cause the tip of the scaler to vibrate at high speeds, between 18,000 and 50,000 Hz. The tip of each scaler uses a different vibration pattern for removal of calculus. The magnetostrictive power scaler vibration is elliptical, activating all sides of the tip, whereas the piezoelectric vibration is linear and is more active on the two sides of the tip.
Special tips for ultrasonic scalers are designed to address different areas of the mouth and varying amounts of calculus buildup. Larger tips are used for heavy subgingival or supragingival calculus deposits, whereas thinner tips are designed more for definitive subgingival debridement. As the high frequency vibrations loosen calculus and plaque, heat is generated at the tip. A water spray is directed towards the end of the tip to cool it as well as irrigate the gingiva during debridement. Only the first 1–2 mm of the tip on the ultrasonic scaler is most effective for removal, and therefore needs to come into direct contact with the calculus to fracture the deposits. Small adaptations are needed in order to keep the tip of the scaler touching the surface of the tooth, while overlapping oblique, horizontal, or vertical strokes are used for adequate calculus removal.

At the heart of ultrasound removal of dental deposits is a combination of four different mechanisms: mechanical treatment, irrigation, cavitation and acoustic turbulence. These mechanisms allow the removal of dental deposits not only in the area of contact with the tip, but also at a short distance from it. However, the presence of mechanisms of cavitation and acoustic turbulence is proved only in studies in vitro.

Ultrasound instruments for the removal of dental deposits work at a frequency of 16-45KHz. The frequency of operation of piezoelectric instruments is from 25 to 45 KHz, and magnetostrictive instruments - from 16 to 42 KHz. Ultrasound scalers have higher power compared to sound scanners. Of ultrasonic, the most powerful piezoelectric devices.

MAGNETOSTRICTIVE SCALERS

Magnetostriuctive scalers are a tube made of a ferromagnetic metal located in a high-frequency magnetic field. Under the influence of the magnetic field, the tube expands and contracts, which is the cause of vibration of the tip. Throughout the operation, a flow of water is passed through the tip through the tip to prevent heating of the surface being cleaned. The appearance of the cavitation effect is also associated with water, which is observed when ultrasound propagates in a liquid medium.

The effect of cavitation is the formation of pulsating bubbles filled with steam, gas or a mixture of them. The cavitation bubbles pulsate, merge, generating strong hydrodynamic perturbations in the liquid, micro streams, erosion of the surface of solids bordering the cavitating fluid. Ultrasonic cavitation can cause in the biological environment such effects as breaking chemical bonds and initiating chemical reactions, eroding the surface of solids and glowing. In addition, the effect of ultrasound is due to the complex effect of thermal, mechanical, physicochemical factors accompanying the propagation of ultrasound in a biological environment.

The magnetostriective scaler nozzle generates elliptical and circular oscillatory motions. This allows the use of all surfaces of the nozzle. The magnetostriective scaling nozzle quickly and significantly heats up, so a large amount of water is required during operation. This property of magnetostriective scalers makes it possible to somewhat reduce the pain sensations of the patient in the presence of sensitivity of the neck of the teeth to the cold.

The main magnetostriective scalers:
The piezoelectric effect is a phenomenon that is observed in the samples of some anisotropic materials and consists in the violation of the equilibrium distribution of electric charges under the action of mechanical deformation of the sample. In piezoelectric instruments high-frequency vibration produces a quartz crystal. These tools use a small amount of water.

When piezoelectric scalers work, the oscillations propagate in the longitudinal direction, the amplitude of the oscillations is from 6 to 100 μm. With this movement, only 2 sides of the nozzle are activated. This complicates the work, however, it is believed that piezoelectric scalers have less damaging power, compared to magnetostrictive and sonic scalers.

Basic piezoelectric scalers:
Scalers of EMS (Switzerland), Amdent Biotrol (Sweden), Satelec (France) Siroson L (SIRONA). Sound instruments also have a rod that vibrates under the influence of compressed air. The oscillation frequency is from 2 to 6 KHz, the amplitude of the oscillations is up to 1.5 mm. Sound scalers create elliptical oscillatory motions, the radius of which decreases with increasing pressure on the surface being cleaned. With these vibrations, all sides of the nozzle are active. Maximum vibrations without noticeable movement of the tip occur when the pressure on the surface being cleaned is not more than 80 grams.

The power of these tools increases when the instrument is pressed, and at the same time, the unpleasant sensations of vibration in the patient are amplified. Just like in ultrasonic scalers, when excessive pressure is applied to the surface being treated, the oscillations stop and work becomes impossible. Most often, sound scalers are available in the form of a tip for turbine connectors of dental units.

Basic sound scalers:
Titan-S, Titan-Univer (Syntex Dental Co.), nozzles for the tip SONICflex: paro and scaler. The set of electric scalers includes various nozzles. According to the materials from which they are made, the nozzles are:
✓ metal (usually steel),
✓ Teflon,
✓ diamond,
✓ carbon-composite
✓ metal with nitrite-titanium sputtering.

To remove massive dental deposits, the use of thicker tips is indicated. Thin attachments are needed to remove a small amount of tartar, to treat periodontal pockets and to work in the interdental space.

Universal thin nozzle is used to remove supragingival dental deposits from approximal and flat surfaces of teeth. Nozzles in the form of a blade with a wide tip is used to remove dental deposits from the flat surfaces of the teeth and the masticatory surface. Nozzles in the form of small hand scalers are used to remove supragingival dental deposits from narrow interdental spaces.

A nozzle resembling a therapeutic hand chisel is used to remove supragingival dental deposits from the front group of teeth. Nozzles for removing
subgingival dental deposits have a safe tip and a special bend. For the treatment of implants, carbon composite composites Periosoft (for Suprasson P-5 Booster and Suprasson P-MAX) are produced.

The sound scaler Corsair (W & H) has a fundamentally new system of attachments. A set of nozzles contains attachments for each tooth surface, depending on the quality of the dental deposits.

One of the major drawbacks of electric scalers is the existence of a large number of contraindications for their use. Contraindications are associated with the biological effects of sound and ultrasound on the human body. If patients have contraindications, it is necessary to use hand tools to remove dental deposits.

Current research on potentially more effective methods of subgingival calculus removal focuses on the use of near-ultraviolet (NUV) and near-infrared lasers, such as Er,Cr:YSGG lasers. The use of lasers in periodontal therapy offers a unique clinical advantage over conventional hand instrumentation, as the thin and flexible fibers can deliver laser energy into periodontal pockets that are otherwise difficult to access. Near-infrared lasers, such as the Er,Cr:YSGG laser, have been proposed as an effective adjunct for calculus removal as the emission wavelength is highly absorbed by water, a large component of calculus deposits. An optimal output power setting of 1.0-W with the near-infrared Er,Cr:YSGG laser has been shown to be effective for root scaling. Near-ultraviolet (NUV) lasers have also shown promise as they allow the dental professional to remove calculus deposits quickly, without removing underlying healthy tooth structure, which often occurs during hand instrumentation. Additionally, NUV lasers are effective at various irradiation angles for calculus removal. Discrepancies in the efficiency of removal are due to the physical and optical properties of the calculus deposits, not to the angle of laser use. Dental hygienists must receive additional theoretical and clinical training on the use of lasers, where legislation permits.

6. Self-monitoring materials:

A. Tasks for self-control

1. For professional hygiene of an oral cavity use:
   A) Stomatological or hygienic hand pieces;
   B) Circular brushes for a stomatological handpieces;
   C) Ultrasonic systems for removal of dental deposit;
   D) Chemical substances for removal of dental deposit;
   E) All answers true.

2. A thickness of a mature tooth plaque:
   A) To 10 microns;
   B) To 50 microns;
   C) To 150 microns;
   D) To 200 microns;
   E) To 300 microns.

3. Grace curettes are used for:
   A) manual method of dental deposit removal
   B) Chemical method of dental deposit removal
   C) Apparatus method of dental deposit removal
   D) Physical method of dental deposit removal
   E) Air-abrasive method of dental deposit removal

4. Methods of elimination soft and mineralized dental deposit:
A) Mechanical, physical;  
B) Manual, physical, chemical;  
C) Mechanical, combined;  
D) Mechanical, chemical;  
E) Physical, chemical, manual, combined.

5. For manual method of dental deposit removal are used:  
A) spoon excavator  
B) Gingival trimmers  
C) set of Zaks hooks  
D) Grace curettes  
E) All are true

6. Quality of elimination of dental deposit is defined after processing of a teeth surface:  
A) 2 % a solution of sodium bicarbonate;  
B) Solution by Lughole;  
C) 0,06 % a solution chlorgecsydine;  
D) 2 % a solution methylene dark blue;  
E) 0,02 % a solution furacyline.

7. Desorbents - preparations which break adsorption of bacteria on a tooth surface. Them concern:  
A) Preparations of fluorine and monofluorinphosphate in low concentration;  
B) Antibiotics and antiseptics;  
C) Enzyme preparations;  
D) Dyes;  
E) EDTA, weak acids.

8. Membrane which warn attachments of a tooth plaque and dental deposite:  
A) EDTA, hydroquinone;  
B) Enzyme and not enzyme preparations;  
C) 2 % indocile acid, 20 % indocile zinc;  
D) Antiseptics;  
E) Antibiotics.

9. Solvents, preparations which destroy a dental calculus:  
A) EDTA, hydroquinone, dairy, a lemon acid;  
B) Antiseptics;  
C) Antibiotics;  
D) Glycerophosphate, tin and sodium fluorine;  
E) Enzyme preparations.

10. Surface-active substances, preparations which have bactericidal action and interfere with formation of a dental calculus:  
A) EDTA, hydroquinone;  
B) Enzyme preparations;  
C) Antibiotics and antiseptics;  
D) Desorbents;  
E) Weak acids.

7. Recommended literature

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

Additional:

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

The methodical reference is made by the docent Marchenko I.Ya.