

MINISTRY OF HEALTH OF UKRAINE  
ODESA NATIONAL MEDICAL UNIVERSITY  
Department of Pediatric dentistry

# **NURSING PRACTICE IN PEDIATRIC DENTISTRY**

Methodological development  
for practical classes  
in the academic discipline




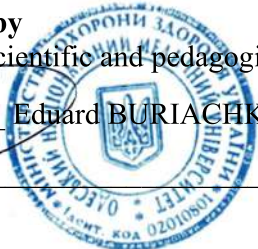
Odesa  
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2024



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**CONFIRMED by**  
Vice-rector for scientific and pedagogical work

  
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The purpose of this methodological development is to prepare higher education students for professional activities as nurses in the pediatric department of a dental clinic for mastering the skills of organizing the work schedule, performing basic dental manipulations, filling out reporting documentation, processing dental instruments and equipment etc. with the aim of deepening the theoretical knowledge and professional competencies of students.

For students of dental faculty.

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# Practical lesson No.1

**Topic:** Organization of work of children's dental departments of various profiles. Professional duties of a nurse in the therapeutic department of a pediatric dental clinic. Safety rules for conducting nursing manipulations in a pediatric dentistry clinic.

**Purpose:** The purpose of teaching the discipline is to prepare students for professional activities as nurses in the pediatric department of a dental clinic, mastering the skills of organizing the work schedule in a dental clinic and performing basic dental procedures, filling out reporting documentation. Nursing practice in a pediatric dental clinic also includes the processing of dental instruments and equipment in the dental office, cleaning the premises in the dental department, knowledge of the peculiarities of providing emergency care to children in the practice of pediatric therapeutic dentistry.

**Main concepts:** asepsis, antisepsis.

**Equipment:** multimedia projector, laptop.

## Plan

1. Organizational activities: greetings, checking the attendees, announcing the topic, the purpose of the lesson, motivating higher education students to study the topic.

2. Control of the reference level of knowledge:

*2.1. Requirements for theoretical readiness of higher education students to perform practical classes (knowledge requirements, list of didactic units).*

To know:

- Know the structure of the pediatric dental clinic.
- Know the basic equipment of the dental office.
- To know the main professional duties of a nurse of the dental department.
- Know the safety instructions for working in a dental office.
- Know the rules for using electrical appliances in the dental office;
- Be able to provide first aid in case of electric shock.

- Know the classification of dental instruments for its purpose.
- Know the dental instruments for examination of the oral cavity and its purpose.
- Know the dental instruments for the preparation of carious cavities and its purpose.
- Know the types and purpose of dental tips.
- Know the classification of cutting dental instruments for its purpose and material of manufacture.
- Know the tools for filling carious cavities and their purpose.
- Know the tools for processing fillings and their purpose.
- Know the tools for removing dental plaque and their purpose.
- Know the rules for using instruments for examination of the oral cavity.
- Know the rules for using instruments for the preparation of carious cavities.

## *2.2. Overview of the topic:*

Children's health care facilities serve children from 0 (birth) to 14 years 11 months. 29 days, that is, until they reach the age of 15. There are different ***types of outpatient dental care for children***.

- Children's dental polyclinics (regional, oblast, city, district) are independent institutions with therapeutic, surgical, orthodontic departments, physiotherapy, X-ray rooms, and often separate rooms for the treatment of diseases of the oral mucosa and periodontium. Some clinics also have an anesthesiology department for treating children under general anesthesia. There are such institutions in large cities of the country. They are essentially the center for the provision of pediatric dental care in the respective territory (republic, province, oblast, city).

- Children's departments of dental polyclinics and dental departments of children's territorial multidisciplinary polyclinics are established in the districts of large cities and cities of regional subordination.

- There are children's dental offices in municipal central and district hospitals, as well as directly in children's institutions (nursery-garden complexes, schools, orphanages, etc.).

- In rural areas and settlements that do not have separate rooms for children's care, the dentist sees children out of turn, and 2 days a week are allocated for routine sanitation of schoolchildren and preschoolers.

**Basic dental services:**

1. Examination room.
2. Department of prevention of dental diseases.
3. Department of therapeutic dentistry.
4. Department of Surgical Dentistry.
5. Children's dental department, which includes mobile rooms for oral cavity sanitation in preschools and schools, and stationary rooms.
6. Orthopedic departments.

**Auxiliary services:**

1. Physiotherapy department.
2. X-ray department.
3. Sterilization department with an autoclave room.
4. Speech therapy room.
5. Accounting department.
6. Administrative and economic part.
7. Registration office.
8. Dental laboratory.

If it is impossible to organize a specialized district dental clinic, a dental department is organized as part of a general clinic. Such a dental department shall include the following rooms: examination room (also known as acute care room), therapeutic room, surgical room, orthodontic room, room for treatment of diseases of the oral mucosa and periodontium.

The organization and functioning of dental treatment and prevention facilities (polyclinics, departments, offices) is carried out in strict accordance with the sanitary rules for the arrangement, equipment, operation of outpatient dental facilities, occupational safety and personal hygiene of personnel.

Outpatient dental care is provided in various medical and preventive institutions: independent dental polyclinics (district, city, regional, provincial); dental departments that are part of territorial (multidisciplinary) city polyclinics, central district hospitals and medical and sanitary units of enterprises; dental offices of hospitals, dispensaries, women's clinics, schools, higher and secondary specialized educational institutions; medical and health centers of industrial enterprises and in hospitals.

In dental polyclinics and dental departments, patients are treated differentially in terms of therapeutic and surgical dentistry. In dental offices

that are part of hospital outpatient clinics, health centers of enterprises, hospitals or educational institutions, a mixed reception (therapeutic and surgical dentistry) is conducted.

The dental clinic has the following departments and rooms: a therapeutic dentistry department with a room for the treatment of periodontal and oral mucosa diseases, a surgical dentistry department (room) with an operating room, an orthopedic department with a dental prosthetic laboratory and a casting room, a mobile dental care department, physiotherapy, X-ray and anesthesia rooms. In the absence of an independent children's polyclinic, a children's department with an orthodontic room and a mobile room for oral cavity rehabilitation in schools and preschools is organized as part of the adult dental polyclinic.

It is advisable to organize independent children's dental polyclinics in cities with a total population of more than 200,000 people, as well as in all regional centers.

A dental institution must be located in a separate building. In some cases (if its structure does not include X-ray and physiotherapy departments (rooms)), they may be located in residential buildings. In all cases, dental institutions must comply with sanitary and hygienic standards, labor protection, safety and fire safety requirements.

The dental department (polyclinic, office) must have centralized hot and cold-water supply and sewerage, and lockable containers for collecting dry waste and materials after disinfection near the building. In case of mandatory centralized electricity supply, there must additionally be a source for emergency power supply.

The lobby or hall should have sufficient space to accommodate patients (approximately 0.3 m<sup>2</sup> per person, but not less than 18 m<sup>2</sup>). Information services should be located in these places.

A wardrobe for visitors should be equipped with at least 0.1 m<sup>2</sup>, and for employees - at least 0.8 m<sup>2</sup> per 1 place. In the registry office, it is advisable to have at least 5 m<sup>2</sup> per registrar, but in general - at least 10 m<sup>2</sup>. The reception area should include a room for issuing sick leave certificates with an area of 10-12 m<sup>2</sup>.

Toilets for staff and patients should be separated.

The availability of transportation and telephone communication is mandatory. It is advisable to equip internal communication for the efficiency of employees, and to install a pay phone for patients.



For normal functioning, a health care facility needs to be fully provided with the necessary furniture, hard and soft equipment.

The rooms of the children's department should not be connected to adult rooms. For this purpose, a separate entrance, lobby, wardrobe and toilet are provided.

The therapeutic department consists of rooms for the treatment of diseases of the teeth, periodontium and oral mucosa. In some dental clinics, the therapeutic department includes a physiotherapy room.

The room of the therapeutic dentistry office should have an area of 14m<sup>2</sup> if one chair is installed in it. For each additional chair, at least 7 m<sup>2</sup> is allocated, and for a universal dental unit 10 m<sup>2</sup>.

The therapeutic dentistry office is equipped with a dental chair, a universal dental unit with handpieces and a set of dental instruments (mirror, probes, tweezers, spatula, excavator), instruments for filling and removing dental plaque, drills for straight and angular handpieces, endodontic instruments, filling materials, and medicines.

Mercury is used to make amalgam fillings, so certain sanitary and hygienic measures are provided for in the therapeutic dentistry office: the floor is covered with linoleum, which rises to the wall surface by 5 cm; the ceiling and walls (to a height of 2 m) are painted with silicate paints (oil paints are also available); a fume hood is installed. In large dental clinics, a special room is allocated for the manufacture of amalgam fillings.

A surgical department is provided only in large non-categorical dental clinics with 6 or more dental surgeons on staff.

The orthopedic department includes orthopedic rooms (office), a dental laboratory and a foundry.

### **Extract from the “Job Description of a Dental Nurse”**

#### **I. General part.**

The main task of the nurse of the dental department is to provide services to dentists in the clinical room.

A nurse is appointed by the chief physician with the approval of the head of the department and the chief nurse and dismissed by order of the chief physician. In her work, she is guided by the polyclinic's charter, the provisions of the treatment and prevention department on the internal regulations of the polyclinic, the job description, order No. 408 of July 12, 1989, industry standard 42-21-2-85, and the polyclinic order.

## II. Qualification requirements.

A healthcare worker with a completed medical education is appointed to the position of a nurse.

A nurse shall know:

- anatomy and basics of human physiology;
- general information about the symptoms of major dental diseases;
- signs of clinical death;
- etiology and main signs of various human diseases;
- principles of sanitary and hygienic and anti-epidemic regime, including particularly dangerous infections;
- measures for the prevention of various human diseases;
- rules for providing pre-hospital emergency care;
- basics of asepsis, antisepsis, desmurgy;
- methods of administration of medicines and conditions of their storage;
- measurement of blood pressure;
- performing intravenous and parenteral injections;
- rules for keeping medical records;
- basics of ethics and deontology;
- rules and instructions on labor protection and safety.

## III. Functions.

The area of work of a nurse is a dental office. She should fully provide the workplace of the dentist for direct reception of patients, carry out the prescriptions of the doctor of the office, orders of the head nurse, head of the department, monitor the implementation of the norms of the sanitary and hygienic regime of the office by the junior nurse.

## IV. Functional duties.

- To check the work of a junior nurse before the beginning of admission of patients.
  - Prepare dental equipment for work (connect to the network).
  - Check the equipment for serviceability. In case of malfunction, make a note in the maintenance log and inform the electrician, mechanic.
  - Before the start of the appointment, prepare the dentist's workplace: pour alcohol, hydrogen peroxide, iodine, liquid for cleaning diamond instruments, cover the sterile table.
  - During the reception of patients, sterilize the instruments, process them according to the industry standard 42-21-2-85 and Order No. 408, provide doctors with sterile instruments in trays, prepare dressings, and mix filling material.

- Conduct ventilation, quartzing, general cleaning according to the schedule, and perform azopyramid and phenolphthalein tests.
- Maintain all necessary documentation in the office.
- Monitor the availability of medical instruments in the clinical room and hand them over to the nurse on duty.
- Know the measures for emergency care and be able to provide first aid to the patient in case of emergency. Know the actions of a nurse in the presence of a patient with a suspected particularly dangerous infection.
- Monitor the shelf life of medicines in the clinical room.
- Provide the office with the necessary medical materials (obtained from the senior nurse of the department).
- To monitor the economical use of materials, electricity, water, compliance with safety rules and fire safety measures.
- Conduct conversations with patients. Participate in nursing conferences in the clinic.
- In communication with patients and employees to comply with the rules of medical ethics and deontology.
- The nurse is prohibited to leave the workplace during the reception of patients without a valid reason.

#### V. Functional rights.

A nurse has the right to:

- to control the work of junior nurses;
- to improve their qualification once in five years;
- to safe working conditions;
- to appeal to the management of the clinic to improve working conditions;
- to receive overalls and personal protective equipment necessary for work.

#### VI. The system of subordination in connection with the position.

The position is subordinate to the head of the department, the head nurse, the head physician. Works in close contact with the dentist and the management of the clinic.

#### VII. Level of responsibility for the work performed.

The nurse is responsible for:

- timely and accurate implementation of doctor's prescriptions;
- economical use of electricity, water, gas;
- non-compliance with safety and fire safety rules;
- availability of medicines for emergency medical care in the office;

– fulfillment of existing orders and industry standards for compliance with the sanitary and anti-epidemic regime;

– violation of the internal regulations, failure to comply with the provisions of this instruction and the instructions of the dental clinic management;

- rational use of equipment and instruments in the clinical office;
- storage of medicines, including groups A and B.

#### VIII. Criteria for evaluating the work of a nurse.

The performance evaluation of a dental office nurse is:

- assessment of professional training;
- absence of comments from the head nurse and the head nurse on the implementation of sanitary and epidemiological standards in accordance with Order No. 408 and industry standard 42-21-2-85.

#### IX. Location of the workplace.

The nurse's workplace is an office equipped with cabinets, tables, a safe, dental equipment, devices, chairs, and a sterilizer.

A nurse is prohibited from leaving the workplace while receiving patients without a valid reason.

In case of production necessity, the head of the department and the head nurse have the right to transfer a nurse from one clinical room to another.

### **An extract from the “Instruction on safety and occupational sanitation in dental offices”**

#### I. Requirements for staff.

Only persons are allowed to work in the office:

- who have passed a mandatory medical examination for professional fitness upon admission to work. Subsequent medical examinations - once every 12 months;
- who have passed an introductory briefing;
- who have been trained, instructed and tested on safe work practices and methods at the workplace with a signature in the relevant journal;
- who know the requirements of this manual and the operating instructions for specific devices within the scope of their functional responsibilities;
- know how to provide first aid in case of electric shock.

#### II. Dangerous and harmful production factors:

- electric current up to 220 volts in electrical devices and cables;

- air and water pressure of up to 6 kg/cm<sup>2</sup> in compressors, hoses, pipes and apparatus;
- chemical reagents and drugs that emit various harmful gases;
- radiation from quartz lamps;
- high temperature of sterilization cabinets and electric heating devices.

### III. Electrical safety requirements:

– all cables, plugs and sockets of the power supply of the devices must be free of damage, and during the operation of the devices their heating is not allowed;

– all metal cases of electrical devices must be reliably grounded to the grounding circuit. Each apparatus is grounded with its own independent wire or a third wire inside the power cord. If defects are detected and if there is any doubt about the safety of the device, immediately disconnect it from the network and call an engineer or a medical technician;

– medical personnel are prohibited from performing any repair work on the devices.

### IV. Before starting work:

– visually inspect the damaged equipment and the reliability of its grounding;

– when working with potent substances (ether, formalin, chloramine, phenol, etc.), as well as with blood, saliva of patients, wear personal protective equipment (gloves, mask, goggles, etc.)

– when plugging in the electric plug, make sure that the cord, plug and socket are not damaged.

### V. During operation:

– monitor the operation of the equipment and the patient's condition at all times;

– use only standard high-speed handpieces and seamless cords. The use of a drill for dental work is strictly prohibited;

– when quartzizing the office, it is prohibited to be present in it without protective goggles;

– when servicing machines and devices, be sure to disconnect them from the mains.

### VI. In emergency situations:

– in case of detection of defects in the devices, damage to the cable, cord, plug, socket, as well as in case of doubt about the safety of the devices, immediately disconnect the device from the network;

- immediately notify the administration of any malfunctions or defects, and call a repair technician;
  - in case of an accident, immediately provide first aid to the victim.
- VII. Safety requirements after the end of work:
- disconnecting equipment from power sources;
  - putting the equipment and workplace, tools and devices in order.

**An extract from the “Instruction on safety and occupational sanitation in dental offices”**

I. The following persons are allowed to work:

- have a secondary education;
- have passed a medical examination within a certain period of time;
- undergo safety training once a quarter;
- have clean and undamaged overalls and personal protective equipment. Home and work clothes are kept in separate closets;
- have undergone an introductory and initial safety briefing, familiarization with the department's work schedule and functional responsibilities.

II. Before the start of the working day:

- a nurse, coming to work, should take off personal clothes and shoes and put on a gown, cap, changeable shoes and protective devices provided for by the standards;
- hang up home clothes and workwear in different places designated for their storage;
- the nurse must check the suitability of the equipment, and in case of defects, immediately inform the head of the department, who must take measures to eliminate the defects. It is prohibited to work on such equipment.

III. During work:

- perform work in accordance with functional responsibilities;
- when working with bleach and other disinfectants, observe safety rules to prevent their contact with skin, mucous membranes, and respiratory organs (wear a respiratory mask);
- during contact with a patient, keep hands and work clothes clean;
- disinfect in case of contact with blood and other secretions;
- monitor the quality of disinfectants, avoid using old ones that have lost their activity;
- keep the workplace in order;
- protect hands from water and disinfectants with rubber gloves;

– when using electrical appliances and electrical equipment, the following rules must be observed:

a. do not leave unattended electrical appliances on;

b. all electric heating appliances must be placed on a rubber mat;

c. if you smell burning, smoke or fire, turn off the electrical appliances immediately and report it to the head of the department;

d. before plugging in electrical appliances, make sure that the electrical wiring and starting equipment (cords, plugs, sockets) are in good condition.

e. during the operation of dental equipment, its inspection, repair and cleaning are prohibited;

– the nurse of the manipulation room should work in an apron, gloves, mask;

– cotton balls must be disinfected in a disinfectant solution after intraoral manipulations;

– ampoules with medications must not be opened without a saw and cotton ball to prevent injuries;

– the cannulas of disposable syringes should be carefully cut with scissors, observing all measures to prevent injuries, and special tools should be used when opening vials of sterile solutions;

– in the event of other unforeseen situations, immediately report to the head of the department, take measures to evacuate patients and ensure the safety of medical personnel.

IV. In case of emergency:

– call the emergency service (fire brigade, emergency - heat, electricity networks);

– if it is impossible to immediately eliminate or eliminate the danger of power outage, water supply, etc., ensure evacuation of patients and staff;

– in case of emergency situations, report to the administration.

V. Upon completion of work:

– change clothes, place overalls in a specially designated closet;

– report to the head of the department about malfunctions of equipment, alarms, violations of safety regulations.

### **Extract from the “Instruction on labor protection when using electrical equipment”**

I. General provisions.

a. When using electrical appliances, it must be remembered that an

electric current of 220 V and 0.1 ampere is life-threatening, so when working with electrical appliances, you must follow the rules.

## II. Safety requirements before starting work

a. Before plugging in the appliance, make sure that the power cord, plug, and electrical outlet are in good condition. These parts must not have any faults, damage to the insulation, loose attachment of the electrical outlet and power saw.

b. All medical, diagnostic electrical appliances and electrical mechanisms must be grounded, i.e. connected to the grounding circuit or neutral wire in a 3-pole electrical outlet.

## III. Safety requirements during operation.

a. During operation it is forbidden to:

- leave electrical appliances plugged in unattended;
- plug in appliances with damaged insulation, cracked ceramics, damaged housing and without a reliable fireproof stand;
- pull the plug by the cord, take wet hands on the plug switches or start buttons, as well as wipe the electric wires, electric lamps and electrical appliances that are under voltage with wet rags;
- do not allow water to get on electric motors, current converters;
- take the instrument from the sterilizer that is plugged in, or if it is on the tile that is plugged in;
- use electrical appliances without a dielectric mat, with expired personal protective equipment (dielectric overshoes, gloves, electric tools with insulating handles);
- wear woolen or synthetic clothing in the operating room;
- replace electric lamps when the voltage is on.

If you find broken electric wires, do not touch them. Observe the area of the break and call an electrician.

## VI. Safety requirements after completion of work.

a. Disconnect electrical appliances from the mains, turn off the circuit breaker.

b. Sanitize only when electrical equipment is disconnected.

## VII. Safety requirements in case of emergency.

a. In the event of a characteristic smell of burnt insulation, smoke, immediately disconnect the electrical equipment from the network and report to the head of the department.

b. In case of fire:

- turn off the power supply;



- turn on the fire extinguisher and use it to extinguish the fire;
- in case of impossibility to extinguish the fire on your own, call the fire brigade by phone - 101, inform the administration or the doctor on duty.

Provide first aid if an electric shock victim is found.

First of all, the victim must be separated from live parts. To do this, put on gloves or use a dry cloth to remove the conductive wire with a dry pole or cut it with an ax, avoiding cutting two wires at the same time. It is also possible to separate the victim from the source of current by dry parts of clothing, without touching the exposed parts of the body.

The victim must be freed from the constricting clothing.

In the absence of breathing, perform artificial respiration by mouth-to-mouth and mouth-to-nose and urgently call a resuscitation doctor.

When performing artificial respiration, tilt the patient's head back, use a handkerchief to pull out the tongue and, putting the handkerchief over the mouth, take a vigorous breath with an interval of 1-2 seconds.

The absence of vital signs in the victim does not mean that he or she is dead.

### **Excerpt from the “Instruction on Ensuring Fire Safety Rules in the Premises of a Medical Institution”**

In order to prevent fires in the premises of a medical institution, it is prohibited to:

- cluttering of evacuation routes in case of fire, approaches to primary fire extinguishing equipment;
- stacking furniture, household goods and other things on the steps, cages, corridors;
- leave unattended radios, computers, table lamps, fans, typewriters, lighting and other electrical appliances plugged into the power grid;
- leave office windows, doors, cabinets, safes open after work;
- to use electric kettles, boilers and other heating appliances in the office premises;
- smoking in offices, restrooms, corridors and lobbies.
- staying in employees' offices after work, unless special instructions are given.

The heads of structural units are personally responsible for the implementation of fire safety rules in the respective premises and the fulfillment of the requirements of this instruction by subordinate employees.

***Employees are obliged to:***

- know the fire safety rules and comply with them;
- smoke only in designated areas;
- skillfully use fire extinguishing equipment, prevent their misuse;
- participate in the study of the fire and technical minimum program at fire safety classes;
- in the event of a fire, immediately call the fire department by phone 101, participate in extinguishing the fire with primary fire extinguishing equipment.

*2.3. Questions (quizzes, tasks, clinical situations) to test knowledge on the topic of the lesson:*

**Theoretical questions for the class:**

- The structure of a pediatric dental clinic.
- Basic equipment of the dental office.
- The main professional duties of a nurse in the pediatric dental department.
- Safety precautions for working in the dental office.
- Rules for using electrical appliances in the dental office.
- First aid in case of electric shock

**Practical work (tasks) performed in the classroom:**

- Provide a diagram of the organization of the children's city clinical dental clinic in Odesa.
- List the basic equipment of the dental office.
- Perform the main professional duties of a nurse in the pediatric dental department.
- Perform the safety rules of work in the dental office.
- Perform the rules for using electrical appliances in the dental office.
- Provide first aid in case of electric shock.

3. Formation of professional skills (mastery of skills, supervision, determination of treatment regimen, laboratory testing, etc:)

4. Summarizing the results is carried out at the end of the practical training. Assessment of the level of knowledge of higher education students is carried out on a 4-point scale. The final grade for a practical lesson includes such components as assessment of theoretical knowledge on the topic of the lesson, assessment of practical skills and manipulations with

mandatory announcements to students. The grade for one practical lesson is the arithmetic mean of all components and can only have an integer value (5, 4, 3, 2), which is rounded according to the statistical method.

### **Recommended references:**

#### *Main*

1. L.O. Khomenko. Propaedeutics of children's therapeutic dentistry. – Kyiv: Book Plus, 2021. – 320 p. ISBN: 978-966-460-043-3
2. Nursing in dentistry: study guide / I.P. Mazur, L.O. Shcherbak, S.V. Khliebas, et al. Medical University "Medicine" 2017. – 160 p.
3. Basics of nursing: V. Kapustnyk, V. Lisovyi, L. Olkhovska. “Medicine” 2018. – 912 p.

#### *Additional*

1. Patient care and medical manipulation technique: study guide / edited by L.M. Kovalchuk, O.V. Kononov. – 3rd ed., revised. and added Kyiv: AUSPH “Medicine”, 2017. - 600 p.

#### *Electronic information resources:*

1. Website of the Association of Dentists of Ukraine. <http://www.udenta.org.ua>
2. Website of the National Institute of Health. <http://www.nih.gov>

## Practical lesson No.2

**Topic:** Methods of asepsis and antisepsis. Methods and means of disinfection and sterilization of dental instruments and equipment. Processing of medical devices and care items.

**Purpose:** in-depth mastery of the discipline by improving the theoretical knowledge and professional competencies of higher education students in the study of methods of asepsis and antisepsis, methods and means of disinfection and sterilization.

**Main concepts:** asepsis, antisepsis, disinfection, sterilization.

**Equipment:** multimedia projector, laptop.

### Plan

1. Organizational activities: greetings, checking the attendees, announcing the topic, the purpose of the lesson, motivating higher education students to study the topic.

2. Control of the reference level of knowledge: frontal survey of higher education students, communication with parents of children to collect anamnesis, clinical examination of children, drawing up a clinical examination plan, discussion on the justification of the diagnosis. Control of knowledge and skills of basic examination in the clinic of pediatric dentistry.

*2.1. Requirements for the theoretical readiness of higher education students to perform practical classes (knowledge requirements, list of didactic units).*

Know:

- Know the structure of the pediatric dental clinic.
- Know the basic equipment of the dental office.
- To know the main professional duties of a nurse of the dental department.
- Know the safety instructions for working in a dental office.
- Know the rules for using electrical appliances in the dental office.
- Be able to provide first aid in case of electric shock.
- Know the essence of the concept of “sanitary and anti-epidemic regime”.

- Know the concept of asepsis and antisepsis. Methods of antisepsis.
- Know the classification of dental instruments for its purpose.
- To know the dental instruments for examination of the oral cavity and its purpose.
- Know the dental instruments for the preparation of carious cavities and its purpose.
- Know the types and purpose of dental tips.
- Know the classification of cutting dental instruments for its purpose and material of manufacture.
- Know the tools for filling carious cavities and their purpose.
- Know the tools for processing fillings and their purpose.
- Know the tools for removing dental plaque and their purpose.
- Know the rules for using instruments for examination of the oral cavity.
- Know the rules for using instruments for the preparation of carious cavities.
- To understand the concept of “disinfection” and know its purpose.
- Classify the main sections of disinfection.
- Explain the types and methods of disinfection.
- Analyze the risk categories of infectious lesions in contact with environmental factors.
- Suggest the main chemicals for disinfection in pediatric dentistry and interpret their effect on microorganisms.
- To learn the concept of “pre-sterilization cleaning”.
- Classify the main methods of pre-sterilization cleaning.
- To organize the stages of manual pre-sterilization cleaning.
- Explain the basic methods of mechanized pre-sterilization cleaning.
- To propose means and modes of disinfection and pre-sterilization cleaning, combined in one stage - pre-sterilization cleaning.
- To propose the basic methods of quality control of pre-sterilization cleaning.
- Know the definition of “sterilization” and its methods.
- Know the method of air sterilization: devices, modes, quality control.
- Know the method of steam sterilization: devices, modes, quality control.
- To know the method of chemical sterilization: devices, means.
- Know the method of sterilization by ionizing radiation and boiling.

- Know the method of sterilization in a glasperlen sterilizer.
- Know the conditions and terms of storage of instruments and materials after sterilization.
- Know the rules for processing equipment in the dental office.
- Know the rules for processing disposable and reusable instruments in the dental office.
- Know the purpose of the Terminator, Assistina devices.
- Know the rules for cleaning the premises in the dental department.
- Know the rules of current cleaning.
- Know the rules of general cleaning.
- Explain the rules for the use and processing of medical workwear.
- Explain the rules of use and processing of rubber gloves.
- Explain the rules for the use of protective masks.
- Explain the rules of use and processing of protective shields.
- Explain the rules for the use and handling of protective and light protection goggles.
- Suggest measures to prevent infection of healthcare workers and patients.
- Organize the levels and methods of decontamination of healthcare workers' hands.
- Analyze the composition and interpret the rules for using a first aid kit to provide emergency medical care to health care workers in health care facilities.
- Suggest measures for the specific prevention of parenterally transmitted infections.
- Suggest measures in case of suspicion and occurrence of quarantine infections.

## *2.2. Overview of the topic:*

***The sanitary and anti-epidemic regime*** is a set of organizational, sanitary and preventive and anti-epidemic measures that prevents the occurrence of hospital-acquired infections.

The sanitary and anti-epidemic regime includes requirements for the sanitary condition of the territory, internal hospital equipment, lighting, heating, ventilation and sanitary condition of the hospital premises.

The main elements of the set of measures aimed at ensuring the sanitary and hygienic regime in medical institutions are disinfection and strict compliance with the requirements of asepsis, antisepsis and sterilization.

The head of a healthcare facility is responsible for organizing disinfection and sterilization measures. Control over compliance with the sanitary and epidemiological regime is often assigned to the deputy for medical work, hospital epidemiologist and chief (senior) nurse.

Every month, healthcare facilities conduct departmental sterility control of medical devices (dental instruments, linen, gloves, rollers, tampons, drains, burs, endodontic instruments, etc.) and air control in operating rooms, centralized sterilization departments, and autoclave rooms. The operation of sterilization equipment is monitored once every 2 weeks using biotests infected with the spore form of *B. Stearothermophilus* for steam sterilization and *B. Licheniformis* for control of air sterilizers.

**Antisepsis** is a set of measures aimed at the destruction of microbes in a wound, pathological focus or in the body as a whole.

There are physical, mechanical, chemical and biological *methods of antisepsis*.

- The purpose of *physical methods* of antisepsis is to create unfavorable conditions in the wound for the development of bacteria and the absorption of toxins and tissue decomposition products. This is ensured by external drainage of the infected wound with tampons and drains (plastic or rubber), which also serve to wash purulent cavities with antiseptic solutions, drying the wound with thermal and light procedures (irradiation with a solux, quartz lamp), etc.

- *Mechanical* antisepsis includes a number of mechanical measures aimed at the fastest possible removal of necrotic tissues, blood clots, foreign bodies, and with them, microorganisms that have entered the wound. For this purpose, a thorough “toilet” of the wound is performed (shaving of hair, lubrication of the skin around the wound with 5 % alcohol iodine solution, removal of foreign bodies) or its primary surgical treatment.

- *Chemical* antisepsis ensures the destruction of germs in the wound using various antiseptic agents. Antiseptic agents should be bactericidal or bacteriostatic and not harmful to body tissues. In addition, their effect should not be weakened by contact with living tissue.

- *Biological antiseptic methods* are aimed at increasing the body's defenses and creating unfavorable conditions for the development of microorganisms. Biological antiseptics include antibiotics, enzymes, and immune serums. Antibiotics are prescribed by doctors according to strict indications. A nurse has no right to prescribe or cancel them on her own, but she must know the properties of the prescribed antibiotic, its dose, routes

of administration, and possible complications. A prerequisite for prescribing an antibiotic is to determine the sensitivity of microorganisms to it.

Among the biological antiseptics are enzyme preparations (trypsin, chymotrypsin, crystalline chymopsin, ribonuclease, etc.). These drugs cleanse wounds and purulent cavities of pus and fibrin clots, have anti-inflammatory effects and enhance the activity of antibiotics.

Passive and active immunization is also widely used to increase the body's resistance to infection. For this purpose, antistaphylococcal plasma, antistaphylococcal gammaglobulin, antistaphylococcal anatoxin, anti-gangrenous serum, etc. are administered. These drugs are prescribed by a physician in accordance with the relevant instructions.

Currently, aseptics and antiseptics should be considered in a broader sense, which is associated with changes in the species composition and properties of pathogens (high virulence and high resistance to antimicrobial agents). It is also necessary to take into account methods of preventing purulent complications caused by medical interventions and the impact of the epidemic environment in which the patient is located.

The main sources of nonspecific surgical infection are patients with postoperative purulent complications and bacillus carriers. Depending on the localization of the inflammation focus, pathogens are released from the body through various organs and tissues (respiratory tract, digestive system, urinary tract, etc.). The causative agents of hospital-acquired infections are spread by airborne droplets and contact. The main factors of infection transmission are air, hands, linen, dressings, tools, equipment, etc.

**Asepsis** is a set of measures aimed at preventing the penetration of microbes into a wound. Asepsis is based on the rule: everything that comes into contact with the wound (hands of medical personnel, instruments, dressings, linen, air) must be sterile.

The condition of the hands of medical personnel is of particular importance for maintaining asepsis. The skin of the hands contains many germs. They are present not only on its surface, but also in the pores, numerous folds, hair follicles, sweat and sebaceous glands. There are especially many germs under the nail plates, so the fingernails of medical staff should be kept short. An important prerequisite for hand sterility is to protect the skin from any injuries and contamination. Therefore, persons with cracks, abrasions, scratches, burrs, calluses, pustules and other inflammatory processes are not allowed to perform operations. To make the skin of the hands elastic, it is lubricated with cream at night.



A nurse should treat purulent wounds with rubber gloves.

**Dezinfektion** (from French “des” - negation and Latin “infection” - infection) is the destruction of pathogenic microorganisms (bacteria, viruses, rickettsia, protozoa, fungi), their vectors (insects, ticks), and rodents in the environment surrounding a person.

Disinfection involves anti-epidemic measures aimed at interrupting the epidemic process by affecting the mechanism of pathogen transmission. Disinfection or disinfection mainly destroys pathogenic microorganisms. This is how disinfection differs from sterilization, which destroys all microorganisms and their spores.

The purpose of disinfection is to remove or destroy the causative agent of infectious diseases in the environment surrounding the person (in the room, in the air, on furnishings, on utensils, linen, clothing, patient secretions, etc.).

***Sections of disinfection:***

1. disinfection itself - destruction of pathogenic microorganisms,
2. disinsection - destruction of disease vectors (insects, ticks),
3. deratization - destruction of rodents,
4. sterilization - destruction of all microorganisms.

There are two types of disinfection: focal and preventive. *Focal disinfection*, depending on the stage of transmission of the infectious agent, is divided into routine and final.

• *Routine disinfection* is carried out in the focus of infection in the presence of a patient or bacillus carrier. The purpose of current disinfection is the immediate elimination of the infectious agent after its isolation from the patient or bacillus carrier to prevent the dispersal of the infectious agent in the environment. Routine disinfection is carried out by medical staff of healthcare facilities or persons caring for patients.

Routine disinfection is a mandatory measure when a patient is at home, in particular, in case of influenza and other acute respiratory diseases. It is also necessary in cases where the epidemiologist allows the infectious patient to stay at home during the illness, or when the patient's stay at home is provided for by the relevant instructions (scarlet fever, chronic disinfection).

The main measures for routine disinfection are: isolation of the patient, repeated ventilation of the premises, wet-mechanical cleaning of the

premises, disinfection of secretions and objects that could be contaminated.

Routine disinfection in hospitals is carried out to prevent the occurrence of hospital-acquired infections.

Measures that block the occurrence of hospital-acquired infection and ensure timely isolation of its sources include continuous bacteriological control and examination of possible sources and routes of its spread. Handwashing brushes, hand wash, material from the operating table, hoses and tubes for water and air, etc. are subject to bacteriological control. Examination of department personnel for carriers of *Staphylococcus aureus* is carried out once a quarter. Identified bacterial carriers are subject to sanitation until they are fully recovered. Employees who fail to eliminate the chronic inflammatory process of the respiratory tract are transferred to another job.

In order to prevent hospital-acquired infections, the company also plans to use effective sterilization methods and create central sterilization units, use highly effective methods of hand treatment for medical staff, and perform sanitary measures using effective disinfectants.

- *Final disinfection* is carried out once in the center of infection after isolation of the patient or bacillus carrier. The goal is to completely disinfect objects that could be contaminated with the pathogen. The final disinfection is carried out in the foci of those infections whose pathogens are resistant in the environment. These include plague, cholera, infectious hepatitis A, viral hepatitis, etc.

The final disinfection is performed by the disinfection teams of the sanitary and epidemiological station (SES). The team consists of an infectious disease doctor and 1-2 disinfectors. The team should be equipped with a hydraulic pump, 5- and 10-liter buckets, brushes for cleaning soft items, sprayers of powders and liquids, bags for transporting items to the disinfection chamber, containers for disinfectants, clean sterile cloths, oilcloth bags for clean and used rags and used sets of overalls, packaged disinfectants, gowns, caps or scarves, respirators, goggles, rubber gloves, soap.

The final disinfection should be carried out as soon as possible, preferably immediately after the evacuation of the infectious patient. Upon arrival at the infection site, the leader warns everyone about disinfection, determines the place to store the team's outerwear, puts on overalls, examines the focus and finds out the circumstances that determine the scope and content of disinfection measures.

Preventive disinfection is carried out continuously, regardless of the presence of a source of infectious disease. The source of the infectious agent may be persons with chronic and protracted forms of disease, or those who hide their illness or are unaware of it. The purpose of preventive disinfection is to prevent the emergence and spread of infectious diseases and the accumulation of pathogens of these diseases or their vectors in the environment.

- *Preventive disinfection* is carried out in individual areas of facilities, limited areas and large areas. It is advisable to carry it out continuously after the end of the appointment, as well as in between appointments. Preventive disinfection is especially necessary in public areas, as well as in crowded places.

In terms of its content, preventive disinfection can be in the form of routine disinfection (washing glasses and utensils after each use) and final disinfection (chlorination of water that may contain pathogens).

A large section of the work in terms of general sanitary and anti-epidemic measures is disinfection and deratization of premises and various territories.

The methodology of preventive disinfection is not much different from focal disinfection. However, when carrying out preventive disinfection, disinfection methods (high temperature), as well as washing powders, pastes, emulsions, soap, soda, etc. are more widely used.

Quality control of disinfection is carried out visually (sanitary condition of the premises), chemically (checking the activity of disinfectants and solutions) and bacteriologically (sowing material to identify microflora).

Two main methods are used for disinfection: physical and chemical. However, this division is conditional. A third method of disinfection can be distinguished - combined, in which physical and chemical methods of disinfection are used simultaneously (for example, the preparation of the hands of surgical personnel for surgery is carried out in two stages - mechanical cleaning of the skin with soap, brush, warm water and disinfection of hands with various disinfectants). In addition, in practice, different disinfectants are used in a certain sequence.

The choice of disinfection method depends on many factors, including the material of the object to be disinfected, the number and type of microorganisms to be destroyed, and the risk of infection of patients and staff.

The following *categories of risk of infectious lesions* in contact with environmental factors and recommended levels of disinfection (decontamination) are distinguished.

- *Low risk* - objects related to healthy and intact skin or inanimate environmental objects that do not come into contact with the patient (walls, floor, ceiling, furniture, plumbing and sewage equipment). Of course, cleaning and drying are adequate decontamination methods.

- *Medium risk* - equipment whose use does not involve penetration through the skin and into sterile areas of the human body, but comes into contact with mucous membranes or damaged skin, as well as other objects contaminated with pathogens that spread. An adequate method of disinfection is to clean and then disinfect.

- *High risk* - objects that penetrate sterile tissues, including body cavities and vascular systems. Cleaning followed by sterilization is necessary. If sterilization is not possible, it is sometimes sufficient to intensify disinfection.

*The physical method* of disinfection is carried out using physical means (mechanical, thermal, radiation). A relatively reliable method of disinfection is boiling at a temperature of 1000 °C. The object to be disinfected is placed in cold distilled water, heated and boiled for 15-30 minutes from the moment the water boils. To remove dirt, it is advisable to boil in a 2 % solution of sodium carbonate in distilled water. This method is used to disinfect products made of glass, metal, and heat-resistant polymers

*The chemical method* is based on the use of various chemicals that kill microorganisms. For disinfection, only those chemicals are used that have the ability to quickly and detrimentally affect microorganisms.

Chemicals can have the following effects on microorganisms:

- Bactericidal - the ability to kill bacteria;
- Bacteriostatic - the ability to inhibit the vital activity of a bacterium;
- Sporocidal - the ability to kill spores;
- Virucidal - the ability to kill viruses;
- Fungicidal - the ability to kill fungi.

Different chemicals have different strengths to kill microbes depending on their chemical structure, i.e., on the selective effect on the constituent elements of cells.

***Among the chemical disinfectants are:***

a. high-level disinfectants - kill all microorganisms except spores, although some products in this category also kill endospores if there is enough time;

b. intermediate-level disinfectants - kill *M. tuberculosis*, but not microorganisms above the level of *M. tuberculosis*, i.e. endospores;

c. low-level disinfectants - it can be assumed that they can kill some viruses and vegetative bacteria, but not *M. tuberculosis*, or some non-lipid viruses and fungi.

Disinfectants are used mainly in the form of solutions and emulsions. This is due to the fact that small droplets of liquid containing disinfectants are easily and quickly adsorbed by the microbial cell membrane. In addition, disinfectants find access to the cell faster through the aqueous phase.

***Chemical disinfectants are used for chemical disinfection:***

– Chloramine 3 % (in case of tuberculosis infection, 5% chloramine solution) - 60 minutes;

– Hydrogen peroxide 6 % - 60 minutes;

– Presept 0.05 % - 30 minutes (10 tablets of 0.5 g each);

– Lisetol 4 % - 15 minutes (40 ml of the drug + 960 ml of water), 5 % - 5 minutes (50 ml of the drug + 950 ml of water);

– Lysoformin-3000 1 % - 60 minutes, 1.5 % - 30 minutes (15 ml of the drug + 985 ml of water); 2 % - 15 minutes (20 ml of drug + 980 ml of water);

– Vircon 2 % - 10 minutes (20 g of the drug + 980 ml of water);

– Deforma 1 % - 60 minutes (10 ml of the drug + 990 ml of water), 3 % - 30 minutes (30 ml of the drug + 970 ml of water), 5 % - 10 minutes (50 ml of the drug + 950 ml of water);

– Desactin 0.2 % - 60 minutes (2 ml of the drug + 988 ml of water);

– Defect - 2.3 % solution for 60 minutes; 3.8 % solution for 30 minutes;

– Bacillol AF - 15 minutes;

– Septodor forte - 0.4 % solution - 60 minutes, 0.5 % solution - 30 minutes, 0.7 % solution - 15 minutes;

– Septodor - 30 minutes;

– Grotonate - 30 minutes;

– Alaminol – 5 % solution - 60 minutes, 8 % solution - 60 minutes;

– Peroxymed – 3 % solution for 60 minutes;

- Glutaral - 15 minutes;
- Alcohol solution of chlorhexidine 0.5 % - 30 minutes;
- Alcohol 700.

Disinfection with chemicals is carried out by immersing the products in a solution in a special enameled glass or plastic container with a lid. Disconnectable products are disinfected in disassembled form, channels and cavities are filled with disinfectant solution. For products and their parts that do not come into direct contact with the patient's oral mucosa, the method of double wiping (before and after work with each patient) with a napkin moistened with a disinfectant solution can be used.

***Precautionary measures must be taken*** when working with the disinfectant:

- work on the preparation of the working concentrated solution should be carried out in compliance with personal safety measures to protect the skin and eyes (rubber gloves, goggles);
- in case of accidental contact with eyes, rinse them with plenty of running water for 10-15 minutes, instill an albucid solution into the eyes and consult a doctor;
- in case of accidental ingestion of the drug, rinse the stomach with water and consult a doctor;
- in case of accidental skin contact, rinse the affected area with running water;
- in case of respiratory tract involvement, take the victim out into the fresh air and free from tight clothing. Milk intake is recommended. Do not eat or smoke during the preparation of the working solution and disinfection;
- wash your face and hands with soap and water after finishing work.

**Pre-sterilization cleaning** involves the removal of protein, grease, mechanical contaminants and drug residues from the surface of the products. Cleaning is performed manually or mechanized using detergents.

As detergent solutions, a solution of “Biolot” detergent or solutions containing hydrogen peroxide with synthetic detergents (SD) “Progress”, “Marichka”, “Astra”, “Aina”, “Lotus”, “Lotus-Automatic” (the latter two with and without a corrosion inhibitor), etc. are used. To reduce the corrosion of metal instruments, it is advisable to use a solution of “Biolot” detergent or detergent solutions containing hydrogen peroxide with “Lotus” or “Lotus-Automatic” and sodium oleate corrosion inhibitor.

The hydrogen peroxide cleaning solution with SD (including corrosion inhibitor) can be used within a day from the date of manufacture, if the color of the solution has not changed, or until the solution becomes pink, which indicates contamination of the solution with blood, which reduces the cleaning efficiency. The unchanged solution can be heated to 45-550 °C 6 times (the concentration of hydrogen peroxide does not change significantly during heating). The “Biolot” solution is used once.

Pre-sterilization cleaning *by hand* is carried out in the following sequence:

*Stage 1.* Rinse the instruments under running water to remove any residual disinfectant.

*Stage 2.* Immerse the instruments in the cleaning solution for 15 minutes (provided that the products are completely immersed). The cleaning solution is prepared by the staff of the central sterilization room according to one of the methods (Table 1).

*Stage 3.* Rinse each instrument in the cleaning solution with a brush or cotton gauze swab for 0.5 minutes. The temperature of the solution during washing is not maintained.

*Stage 4.* Rinse the instruments under a stream of running water to free them from the detergent. After applying Biolot powder, rinsing lasts 3 minutes, Progress - 5 minutes, and other SD - 10 minutes. Quality control of pre-sterilization treatment of instruments is carried out.

*Stage 5.* Rinse the instruments in distilled water to remove salts from tap water - 0.5 minutes for each instrument.

*Stage 6.* Dry the instruments in a dry heat oven at  $t = 850$  °C until the moisture is completely removed.

**Mechanized** pre-sterilization cleaning is carried out using special equipment by jetting, rotary, ruffing or ultrasound.

The methodology for mechanized cleaning must comply with the operating instructions attached to the equipment. For mechanized cleaning, use the cleaning solutions indicated in Table 1.

Collapsible products are subjected to pre-sterilization cleaning in disassembled form.

The ruffing of rubber products is prohibited.

Drying of products made of natural latex is carried out in accordance with the instructions for use of the products.

At the end of the work shift, the equipment for pre-sterilization cleaning is washed with detergents.

Instruments may be subject to corrosion during operation and presterilization cleaning. Instruments with visible corrosion spots, as well as with the presence of an oxide film, shall be chemically cleaned no more than 1-2 times per quarter. Mechanized cleaning with the use of ultrasound is carried out in the installation “Earring”, in the ultrasonic bath “Ultraest”, “Rossonik”, in an ultrasonic washer.

After disinfection, the instruments intended for *ultrasonic cleaning* are rinsed under running water for 3-5 minutes, placed in a loading device and filled with a cleaning solution to the specified level. Ultrasonication of the instrumentation in the cleaning solution is carried out for 15 minutes.

Ultrasonic cleaning is a fast, safe and effective method of processing. The sound waves traveling through the cleaning solution create a cavitation effect - the rapid formation and bursting of microscopic bubbles. Temperature aids the process. This treatment removes deep contamination, including that which is located in places that cannot be reached to rinse and clean.

It is optimal and economical to combine disinfection and presterilization cleaning in one step. For this purpose, there is a fairly large selection of disinfectants (Table 1) and equipment - machines for washing and thermal disinfection, washing machines.

Table 1

**Means and modes of disinfection and pre-sterilization cleaning, which are combined in one stage - pre-sterilization cleaning**

Disinfectant	Concentration	Exposure	Temperature	Application
Lysetol AF	4,0 5,0	30 min. 15 min.		Manual cleaning of medical devices made of glass, metal, rubber
Grotonate	ready-made solution	30 min.		Manual cleaning of rotating precision tools (drills, mills, etc.), except for tools sensitive to alcohol and alkalis
Vircon	2,0	10 min.		Manual cleaning of medical devices made of glass, metal, rubber



*End of Table 1*

Disinfectant	Concentration	Exposure	Temperature	Application
Septodorforte	0,4	60 min.		Manual cleaning of medical devices made of glass, metal, rubber
	0,5	30 min.		
	0,7	15 min.		
Septodor		30 min.	at least 18 °C	Presterilization treatment without disinfection of medical devices
Lizoformin 3000 + Blanisol	1,5 (Lizoformin 3000) + 0,5 (Blanisol)	30 min.	at least 18 °C	Manual cleaning of medical devices made of glass, metal, rubber
Lizoformin	1,0	60 min.	at least 18 °C	Manual cleaning of medical devices made of glass, metal, rubber
	1,5	30 min.		
	2,0	15 min.		
Disefect	2,3	60 min.	Initial 50 °C, at least 18 °C	Manual cleaning of medical devices made of glass, metal, rubber
	3,8	30 min.		
	2,3	60 min.		
	(Disefect + 3 % calcined)			
Dulbac DTBL	3,0	60 min.	at least 18 °C	Manual cleaning of medical devices: - having channels, locks - not having channels, cavities
	5,0	90 min.		
	2,0	60 min.		
Alaminol	5,0	60 min.		Medical devices
	8,0	60 min.		
Peroxymed	3,0	60 min.		Medical devices

### **Quality control of presterilization treatment of instruments.**

The quality control of presterilization treatment of instruments is carried out by the method of sampling. Previously, benzidine, amidopyrine or

orthotoluidine tests were performed to detect traces of latent blood that may remain due to insufficient cleaning. Currently, the azopyramine test is performed, which is 10 times more sensitive than the amidopyrine test and is not inferior in sensitivity to the benzidine test. Detection of residues of alkaline detergent components is carried out using the phenolphthalein test, the presence of oil (syringes used for oil injections are subject to oil control) is determined using the Sudan III test.

- **Azopyramine test**

Preparation of initial and working solutions of azopyramine.

1. Order a stock solution of azopyramine (amidopyrine 10 g, aniline hydrochloride 0.15 g, 95% ethyl alcohol 100 g) from a pharmacy.

2. Store these solutions in a sealed bottle at +4°C (in the refrigerator) for two months, in a dark place at room temperature for one month.

3. A moderately yellow color during storage without precipitation does not indicate its unsuitability.

4. Immediately before checking the quality of pre-sterilization cleaning of the products, prepare a working solution: mix Azopyram and 3% hydrogen peroxide solution in a 1:1 ratio.

5. If necessary, check the suitability of the azopyram working solution: Apply 2-3 drops of the solution to the bloodstain. If a purple color changes to lilac after 1 minute, the reagent is suitable for use. If the color does not appear within one minute, the reagent is not suitable for use.

***Procedure for making the azopyramid test.***

1. Treat the object to be tested with azopyramine working solution - wipe with a swab dipped in the reagent or apply a few drops of the reagent with a pipette.

2. To check the quality of needle cleaning, draw the reagent into a clean (free of corrosion) syringe and, gradually changing the needles, pass the solution through them, squeezing 3-4 drops onto a napkin.

3. To check the quality of syringe cleaning, use a pipette to add a few drops of reagent to the syringe and after 30 seconds, pour it onto a gauze cloth or cotton swab.

4. The amount of reagent needed to test other hollow products depends on their size.

### ***Contamination indication.***

1. Azopyram detects the presence of hemoglobin and peroxidases of plant origin (plant residues, detergents from bleach, rust and acids).

2. In the presence of traces of blood, no later than 1 minute after contact with the contaminated area, a purple color appears, which then turns into pink-lilac or brown within a few seconds. Coloration that appears later than 1 minute after the reagent is applied to the object is not taken into account.

3. Brown coloration is observed in the presence of rust or oxidizing agents containing chlorine on the objects under examination. In other cases, the color is pinkish-lilac.

4. The inspected products should be at room temperature (not higher than 250 °C). Hot items are not subject to inspection.

5. Do not keep the solution in bright light or high temperature.

6. The working solution (azopyram with hydrogen peroxide) should be used within 12 h. At air temperatures above 250 °C, the working solution is used within 30-40 minutes. During longer storage, spontaneous pink coloration of the solution may appear.

7. After the test, regardless of the results, remove the residues of azopyramine from the examined items, wash them with water and carry out pre-sterilization cleaning of these products again.

### ***Rules for the use of azopyramine elements:***

1. Azopyram should be stored in a tightly closed container separately from food, medicines, disinfectants, concentrated acids and alkalis.

2. In case of contact with skin or mucous membranes, immediately remove Azopyram with a napkin and rinse the area with running water.

3. Azopyram is combustible, so contact with open flames is unacceptable.

#### **• Amidopyrine test**

Preparation of the amidopyrine reagent:

1. Add 2 ml of 30 % acetic acid and 2 ml of 3 % hydrogen peroxide to 2 ml of a 5 % alcohol solution of amidopyrine. The reagent is prepared before use.

2. 5 % alcohol solution of amidopyrine is prepared in 95 % ethanol. This solution can be stored in a vial with a ground stopper in the refrigerator for 1 month.

3. 30 % acetic acid solution and 3 % hydrogen peroxide solution are prepared in distilled water.

4. The reagent is pipetted onto the instruments and waited for up to 2 minutes. In the presence of blood residues, a blue-green color appears. The color change after 2 minutes is not taken into account.

5. In case of a positive reaction to occult blood, repeat the second, third, and fourth stages of presterilization cleaning.

#### • **Phenolphthalein test**

1. To make the test, use a 1 % alcohol solution of phenolphthalein consisting of 60 g of alcohol, 40 g of distilled water and 1 g of phenolphthalein. The alcohol solution of phenolphthalein can be stored in a vial with a lapped stopper in the refrigerator for 1 month.

2. The solution is applied with a pipette to cotton and wiped on the treated instruments. In the presence of residual synthetic detergent, a pink color appears within 30 seconds. In this case, it is necessary to repeat the fourth stage of cleaning, that is, the entire batch of products is rinsed in running water, and then in distilled water.

#### • **Sudan III test**

The Sudan III test is used to determine grease contamination in syringes and other products associated with this contamination.

In 70 ml of 95 % ethyl alcohol heated to 600 °C (in a water bath), dissolve 0.2 g of crushed Sudan III and methylene blue. Then add 10 ml of 20-25 % ammonia solution and 20 ml of distilled water. This solution can be stored in a tightly closed bottle (in the refrigerator) for 6 months.

When checking the quality of cleaning the syringe from grease contamination, 3-5 ml of reagent is added to the syringe and the entire inner surface is wetted. After 10 seconds, the paint is washed off with a large stream of water. Yellow spots and streaks indicate the presence of grease contamination.

The results are displayed in the form No. 257 / u in an additional column.

1% of the products of the same name processed simultaneously in one shift, but not less than 3-5 units from each batch, are subject to daily control. In the event of a positive test for blood, detergent or fat, the entire group of products from which the control was taken is subjected to repeated processing until a negative result is obtained.

Pre-sterilization cleaning is monitored by employees of the Sanitary and Epidemiological Station and the Disinfection Service 2 times a year, by a senior nurse at least once a week, and self-monitoring is performed by the dental clinic staff daily.

**Sterilization** (from the Latin “sterilis” - barren) is the destruction of all microorganisms and their spores using physical and chemical factors. It is carried out to prevent the spread of a number of infectious diseases, the causative agents of which are transmitted through blood and biological fluids.

All products that come into contact with a wound, blood or injectable drugs, medical instruments that come into contact with the oral mucosa and can cause damage to it, and underwear are subject to sterilization. Trayed instrument sets, mirrors, burs, carborundum stone, separation disks, mixing glasses, and other instruments are subject to sterilization.

**The following sterilization methods are available:**

- steam
- air sterilization;
- ionizing radiation;
- chemical with the use of chemical solutions (cold) and gases.

• ***Steam sterilization method***

Steam sterilization is carried out in steam sterilizers (autoclaves), where saturated water vapor under pressure is used.

If you try to boil water high in the mountains, it will boil at a temperature below 100 °C, as the atmospheric pressure is very low there. At sea level, water boils at  $t = 100$  °C, and the steam it turns into has the same temperature as water. No matter how long the water is boiled, its temperature will not exceed 100 °C. However, if you put water in a sealed metal container and heat it, the pressure inside the container will increase, and with it the temperature of the steam. This principle is the basis of the autoclave.

Steam sterilizers come in a variety of designs, sizes, and volumes. Sterilizers are round and rectangular in shape. All types of steam sterilizers have the same construction principle. They consist of three steel cylinders placed inside each other. The inner cylinder is the sterilization chamber in which the material to be sterilized is placed. The middle cylinder is called a water-steam chamber - water is poured into it, which turns into steam

when heated. The water-steam and sterilization chambers are connected to each other. The outer cylinder is thermally insulated. It is a protective casing that reduces heat loss. The autoclave is equipped with a pressure gauge, a warning valve and a funnel for pouring water into the water-steam chamber.

The steam method can be used to sterilize linen (gowns, sheets, towels), dressings, rubber and glass products, and corrosion-resistant metals.

Sterilization is carried out in sterilization boxes without filters, in sterilization boxes with a filter, in double soft packaging made of calico or in packaging made of parchment, non-impregnated sack paper, moisture-resistant sack paper, paper for packaging products on E-grade automatic machines, high-strength packaging paper, double-layer crepe paper.

When sterilizing in an autoclave, certain rules for stacking the box are observed. The palm of the hand should be free to pass through the material in the bins. The material is placed in the bins perpendicular to the holes for steam flow.

When using sterilization boxes without filters (round box RSB), the box is lined with a single layer of cotton cloth before placing the products in them. When using boxes with filters, this is not necessary.

For sterilization, the prepared box with open holes is placed in the inner chamber of the autoclave. The lid is closed hermetically.

Water is poured through the funnel into the autoclave, the level of which is determined by the water gauge. The warning valve is set to the pressure at which sterilization is to be performed - 1.5-2 atm. The valve that removes air and steam is closed. The pressure in the autoclave is brought up to 1 atm, the valve is opened and the remaining air is released along with the steam. After that, the valve is closed again and the pressure is brought up to 1.5-2 atm. The moment the pressure rises to the set point is considered the beginning of sterilization.

#### ***Autoclave sterilization modes.***

*The first mode:* at 2 atm ( $\pm 0.2$ ) for 20 minutes and a temperature of  $132 \pm 20$  °C is recommended for products made of glass, corrosion-resistant metals, textiles, and rubber.

*The second mode:* at 1.5 atm ( $\pm 0.2$ ) for 45 minutes and a temperature of  $120 \pm 20$  °C is used for products made of rubber, latex, certain polymeric materials (high-density polyethylene, PVC - plastics).

At the end of sterilization, steam is released from the autoclave through the outlet valve (a rubber tube is put on it and immersed in a

bucket of cold water or taken outside the room). When the pressure gauge reaches zero, unscrew the screws and open the lid of the autoclave. Remove the sterilization boxes and place them on a table covered with a sterile sheet. After that, immediately close the side openings in the boxes and cover them with another sheet until they cool completely. After sterilization is complete, the water is removed from the autoclave through the outlet valve.

The sterilization mode is set depending on the nature of the material, instruments and sterilization equipment.

The shelf life of sterilized material in sterilization boxes (bins) with a filter is no more than 20 days, in sterilization boxes without filters and in other packages (double packaging of calico, moisture-resistant paper for bags - kraft paper, unimpregnated paper for bags, parchment) - at least 3 days.

Each package must have a tag indicating the name of the material to be sterilized, the date and time of sterilization, and the signature of the employee who performed the sterilization.

If any package is opened for work, its contents must be used within 6 hours.

Only individually wrapped in a strong and bacteria-proof sheath can be considered sterile. The most reliable method of sterilization today is steam sterilization under pressure at the appropriate temperature. In this case, each instrument must be in a package that is permeable to steam and/or gas, but reliably protects against the penetration of microorganisms.

The packaging must be reliable, resistant to high temperature and pressure, must not be destroyed by contact with steam and/or gas, must be simple and easy to use, and must have a reliable and simple indication of the quality of sterilization. For example, self-sealing sterilization bags (Defend, USA) are designed for sterilization of instruments with steam or chemical gases and subsequent storage. The bags are easily and reliably sealed by hand and eliminate the need for thermal gluing devices; Eurosteril sterilization rolls, made of one layer of paper and one layer of polypropylene, are used for steam and gas sterilization together with a Euroseal 2001 sealing device (Euronda, Italy), a packaging machine (Mocom, Italy).

Sterilization rolls are used for packing instruments, dressings or other items, as well as for storing sterile instruments. The rolls have indicators that show the achievement of sterile conditions, and the transparent plastic

allows you to identify the instrument being sterilized or to detect a hole accidentally made by a sharp object.

It is very convenient to use transparent Luminati bags for sterilization together with a sealing machine (Mocom, Italy). Before sealing, it is necessary to remove as much air as possible from the bag to reduce the formation of air pockets.

Individual objects can be handled in the bag, the contents of the bag can be seen, which prevents the need to break its tightness, there is a color indicator on the opaque side of the bag that confirms the sterility of the instrument, and instruments packed and sterilized in Luminati bags can be stored for two years.

*The physical method* is based on the effect of melting crystalline substances to a certain temperature. Before sterilization, a test tube with powdered sulfur, benzoic acid, antipyrine or amidopyrine, the melting point of which exceeds 1100 °C, is placed in the bins. The tube is closed with cotton wool and placed in a box between the layers of material. If the temperature in the autoclave rises to 1200 °C, the powder in the test tube melts and turns into a homogeneous mass. The melting indicator at 1300 °C is urea. Also used are indicators TYPE-120, TYPE-130 manufactured by MKB (Kyiv).

*In the chemical method*, a specially treated strip of filter paper is placed with the products to be sterilized. The word “sterile” is written on it with a simple pencil, soaked in a starch solution and dipped in a solution containing iodine (Lugol's solution). After this treatment, the strip of paper turns intensely blue and the word disappears. At a temperature of 1150 °C, the iodine evaporates, the paper becomes discolored, and the inscription is revealed.

For the purpose of operational control, temporary chemical indicators IC-120, IB-130 by “Vinar”, indicator tape Comply TM thousand two hundred and twenty-two by “ZM” (USA), etc. are placed in the sterilizer, sterilization boxes, and outside them.

Thermal time indicators or TST (time, steam, temperature strips), which change color under the influence of moist heat during sterilization. The low cost of the strips allows them to be used daily.

Indicator tape (3M Autoclave Steam Indicator Tape, 3M, USA) can have strips that change color during autoclaving, which allows you to obtain information about the achievement of a given mode and draw an appropriate conclusion about the quality of sterilization. The tape is securely attached and can be easily removed.



The most reliable method of sterilization control is bacteriological. To this end, small pieces of the material to be sterilized are placed in 2-3 tubes, covered with cotton wool and placed in a box. After sterilization, the tubes are sent to a bacteriological laboratory for testing. If no bacterial growth is observed after 2-3 days, the material is considered sterile. The disadvantage of this method is the considerable duration of the study. Monitoring of the steam sterilizer using biotests is carried out once every two weeks.

Each cycle of the sterilizer is recorded in the sterilization log, which indicates the name of all products, parameters and control results.

- ***Air sterilization method.***

Air sterilization is carried out in special air chambers (dry heat ovens), in which microorganisms are destroyed by high temperature. The temperature of the items to be sterilized in the cabinet should reach 160-2500 °C. Dry heat sterilization takes longer and at a higher temperature than in an autoclave. This is due to the fact that dry hot air is inferior to humid air in terms of bactericidal effect. This method is used to sterilize items that cannot be exposed to moisture due to the risk of corrosion, etc. Heat-resistant, non-flammable materials made of glass, metal, or porcelain are subject to dry heat sterilization. The following materials are not subject to dry heat sterilization: dressings, rubber products, plastic materials, water and water-containing liquids.

Medical institutions use air sterilizers of various designs. However, all of them are easy to operate and maintain, and are installed in rooms without stationary ventilation equipment.

An air sterilizer consists of a thermally insulated case, a stand, a lid, and a sterilization chamber with nets for placing the products to be sterilized. A time relay, a signal lamp for monitoring the start of sterilization, and a toggle switch for setting the selected operating mode (automatic or semi-automatic) are mounted on the front wall of the stand. A thermometer for monitoring the baking tray is installed on the body; 7-thermal insulator; 8-door; 9-seal; 10-heaters; 11-handle.

Items to be sterilized must be dry, packed (in kraft bags) or unpacked in an open container (on an enamel tray or in a tray). The sterilization process consists of loading the sterilizer, heating it to a certain temperature, sterilization itself, cooling and unloading the sterilized items.

The loading of air sterilizers greatly affects the main technical characteristics. With an increase in the degree of loading, the heating time in-

creases, electricity consumption increases, and temperature deviations inside the sterilization chamber can lead to poor-quality sterilization.

When loading sterilizers, the density of objects to be sterilized should not exceed 70 % of the surface. Objects to be sterilized must be placed horizontally in a single layer, evenly distributed.

After the device is plugged in, do not add new objects and materials for sterilization, as this leads to a decrease in temperature and loss of sterilization effect. Furthermore, the ingress of oxygen into the dry heat cabinet during sterilization can lead to fire. If smoldering of the material is detected, immediately turn off the power.

Sterilization modes in a dry heat sterilizer at 1800 °C: sterilization time 60 minutes, at 1600 °C: 150 minutes (2.5 hours). The full processing cycle is longer, as it takes time for the cabinet to heat up and cool down.

Items sterilized by the air method are stored in their packaging for 3 days; items sterilized in open containers without packaging are used immediately after sterilization.

Quality control of sterilization in a dry heat sterilizer is carried out by physical, chemical, biological and thermal (using a thermometer) methods.

For *physical control*, melting indicators are used at 1800 °C - sucrose, thiourea, succinic or ascorbic acid, barbital, at 1600 °C - albugid, aspirin. When the temperature in the dry heat oven is raised to the appropriate level, the powdery substance in the test tube turns into a molten homogeneous mass.

*Chemical control* of sterilization is carried out using thermal time paper indicators IC-180, IC-160 manufactured by “Vinar”, indicator tape Indelir TM one thousand two hundred and twenty-two manufactured by “ZM” (USA).

Test tubes infected with hay or potato bacillus are used as biotests. Bacteriological control is carried out once every 2 weeks.

The results of the quality control of sterilization in a dry heat sterilizer are entered in the “Dry heat sterilizer work log”.

For small metal objects, another variant of dry heat treatment can be used - in a glasperlene sterilizer. A glasperlene sterilizer is a device that allows you to sterilize dental instruments.

The sterilizer consists of an insulated container filled with small quartz balls and a heating element (up to 2180 °C). The balls retain heat, distribute it evenly and serve as a support for small instruments. Small dental instruments: burs, endodontic instruments, mirrors without handles

can be sterilized in a gasperlene sterilizer after pre-sterilization treatment during work with a patient: burs - 20 seconds, mirrors - 1 minute, probes and spatulas - 1.5 minutes.

- ***Sterilization by ionizing radiation***

Radiation sterilization is carried out by ionizing rays of high energy, which can penetrate to different depths into the material to be sterilized. Beta and gamma radiation are mainly used.

Sterilization by ionizing radiation is widely used in industrial enterprises that manufacture single-use instruments. Items are packed in sealed plastic bags. The shelf life (up to several years) is indicated on the package.

- ***Chemical sterilization***

Chemical sterilization refers to sterilization with the help of solutions of chemicals and gases. The term “cold” sterilization is also used in the literature, as it is carried out at a temperature that does not exceed the coagulation temperature of the protein (45-600 °C).

The chemical method is used to sterilize products made of polymeric materials, rubber, special glass, and corrosion-resistant metals. Since chemical compounds destroy mainly the surface microflora, preliminary cleaning of the surface of objects is important.

Various compounds of iodine, chlorine, oxidizing agents, aldehydes, etc. are used for chemical sterilization.

Acetic acid is used in the form of a 1 % solution (“Deoxon-1”). At a temperature of 180 °C, the treatment time is 45 minutes. The solution can be stored for a day, but cannot be reused. When working with acid, it is necessary to wear protective goggles, rubber gloves and an apron. Sterilization quality control is carried out using an ethylene oxide indicator.

Hydrogen peroxide is used as a 6 % solution. At a temperature of 180 °C, the treatment duration is 6 hours, at a temperature of 500 °C - 3 hours. The hydrogen peroxide solution can be used for 7 days if stored in a dark, closed container. Do not reuse the solution.

Glutaraldehyde in the form of a 2.5 % solution is used at 200°C for 6 hours; 8 % Lysoformin-3000 solution at 500 °C for 1 hour; 10 % Gigasept FF solution for 10 hours; 20 % Bianol solution at 210 °C for 10 hours.

For sterilization with chemical solutions, use enamel, glass or plastic dishes with a lid. The items are completely immersed in the solution, laid out freely in it and kept for a certain time with the lid on. After sterilization, the items are removed with sterile tweezers and immersed twice for 5

minutes in sterile distilled water or sterile isotonic sodium chloride solution, each time they are changed under aseptic conditions. Water dishes are pre-sterilized by steam. After that, using sterile tweezers, the instrument is transferred under aseptic conditions to sterile bins lined with a sterile napkin. The shelf life of sterilized products is a maximum of 1 day.

• **Gas sterilization** is used to treat heat-resistant items that cannot be sterilized in an autoclave or in a dry heat oven (catheters, probes made of artificial materials, hoses, prostheses, endoscopes, anesthesia and respiratory equipment, optical devices, cutting and piercing instruments, disposable items made of synthetic plastics).

For gas sterilization, ethylene oxide, ABM mixture (a mixture of ethylene oxide and metal bromide in a weight ratio of 1:2.5), and formalin vapor are most commonly used.

#### **Sterilization modes:**

- ethylene oxide at a dose of 1000 ml/dm<sup>3</sup> under a gas pressure of 0.55 kg/cm<sup>2</sup> and a temperature of 180 °C - 960 minutes (16 hours);
- ethylene oxide at a temperature of 35 and 550 °C;
- with a mixture of ABM at a temperature of 18, 35 and 550 °C;
- steam of a 40 % solution of formaldehyde in ethyl alcohol at a dose of 150 mg/dm<sup>3</sup> at a temperature of 800 °C - 180 minutes (3 hours);
- steam of formaldehyde in ethyl alcohol at a temperature of 42, 45, 650 °C;
- steam of an aqueous solution of formaldehyde at a temperature of 700 °C.

You can also use a 10 % solution (Gigasept FF, Coldspore) according to the instructions.

Ethylene oxide acts bactericidally by alkylating bacterial proteins. It is a colorless gas with an unpleasant odor. Its toxic effects are manifested by headache, nausea, vomiting, and respiratory failure.

For gas sterilization, the EAGLE sterilizer-aerator, the “STERRAD” sterilizer, portable devices (microaerostat MI, volume 2.7 and 2 dm<sup>3</sup> / 1), the “Khvilinka” pressure cooker of three sizes: maximum capacity according to the passport (before the sealing gasket) 8.0, 6.0, 4.5 dm<sup>3</sup>; total volume, respectively, 8.5, 6.5, 5.0 dm<sup>3</sup>. In the factory, special gas sterilizers are used in rooms with exhaust ventilation.

Before gas sterilization, the products are wiped with napkins or dried at room temperature until moisture disappears. Moisture is removed from

the channel of polymeric (rubber, plastic) catheters and tubes using a centralized vacuum or a water jet pump connected to a water tap.

After sterilization, to prevent an explosion, the remaining gas is removed through the exhaust chambers into the exhaust pipes.

Gas penetrates well through plastic packaging and replaces air. Therefore, the products in the package after gas sterilization remain sterile until it is broken.

Sterilization by boiling is carried out in special metal boilers with grids for instruments. The grid of the boiler is covered with gauze, two tweezers, cylinders, syringe pistons, at least two needles per syringe, and hooks for removing the grid on top. Pour cold distilled water, cover tightly and boil for 45 minutes from the moment the water boils. If any other instrument is added to the sterilizer during the boiling process, the boiling is continued for another 45 minutes from that point. At the end of sterilization, the lid of the sterilizer is removed and turned upside down, the hooks are removed with a sterile forceps or tweezers (from the triple solution) and the instrument grate is removed. The grate is placed across the boiler to allow the water to drain. After that, proceed to collect the syringe or transfer the grid to a sterile table and, using a sterile squeegee, place the instruments from the grid onto the sterile table.

Boiling as a method of sterilization of syringes and needles is not provided for in the industry standard 42-21-2-85 "Sterilization and disinfection of medical instruments". However, in exceptional cases (at home), when it is impossible to sterilize syringes and needles in any other way, boiling can be used.

### **Processing of instruments and other objects in therapeutic dentistry**

A modern dental unit is a complex set of pneumatic, electrical, hydraulic and electronic components that are combined in one or more enclosures, installed on the floor or fixed to a dental chair, walls, ceiling. The surfaces of the unit, chair and chairs should be free of cracks, creases, external damage, where dust from prepared teeth, saliva and other aerosols that occur during the preparation of teeth can get and be deposited.

The tubing and hoses of the unit should be easy to handle, have a smooth, wrinkle-free and groove-free surface, and be made of chemically passive material.

The main reusable dental instruments are treated by rinsing from blood, mucus and tissue residues in a disinfectant used for disinfection and pre-sterilization cleaning (e.g., desefect, desactin, lysoformin, etc.). Then they are immersed completely in the disinfectant for 60 minutes in a closed container, rinsed with running water for 5 minutes, rinsed in distilled water for 1 minute, dried in a sterilization cabinet at  $t = 85\text{ }^{\circ}\text{C}$  until moisture disappears and sterilized.

The handpieces for the drill are subjected to conventional disinfection. However, most dental offices use domestic handpieces that are not designed for autoclaving and should be disinfected after each patient. In the offices of therapeutic dentistry, as a rule, disinfection of dental handpieces is carried out by thoroughly wiping the outer parts and the boron channel twice with a sterile cotton-gauze swab moistened with  $70\text{ }^{\circ}$  alcohol, Bacil-lol-Af. The interval between wipes should be 15 minutes.

Reusable dental burs are disinfected, cleaned and sterilized.

Dusting tips, designed to suction dust, fine particles and aerosols, can be disinfected, cleaned and sterilized by autoclaving.

Flexible saliva ejectors, made of non-toxic transparent PVC with a metal wire, are used once. Adapters for saliva ejectors can be disinfected, cleaned and sterilized by autoclaving.

Dental cotton rolls are made of 100 % absorbent cotton and are sterile, or are prepared manually and sterilized by autoclaving. After use, they are disinfected and disposed of.

The cotton roller dispenser, made of clear acrylic, provides an aseptic barrier to aerosols and splashes and is disinfected by wiping with a disinfectant.

Plastic cups are used for drinking and rinsing at the same time. After use, they are disinfected and disposed of.

Disinfectant wipes (“Unisepta – E”, “Unident”, Switzerland; Minuten Wipes, “Alpro Dental-produkte GMBH”) are used to disinfect headrests, armrests, surfaces of hard furniture, apparatus, devices, door handles, tele-phones, surfaces made of various materials (plastic, glass, metal, vinyl leather, etc.). After use, they are disinfected and disposed of.

Mirrors are subject to disinfection, pre-sterilization treatment and sterilization by steam, air or chemical methods (according to the instructions). The working part can be sterilized in a glasperlene sterilizer.

For chemical disinfection of dental mirrors, a 6 % hydrogen peroxide solution is used, the processing time is 60 minutes. After the exposure, the

mirrors are rinsed with sterile water, wiped with a sterile napkin and stored in a sterile tray under a sterile napkin.

Glasses for mixing the filling material are treated by the above methods and sterilized by steam in an autoclave.

The beakers for the rollers are disinfected, cleaned and sterilized in an autoclave or dry heat sterilizer. The beakers are sterilized after 6 hours. If the sterile beaker tweezers are stored in the packaging, they can be used for 3 hours, and if they are stored in a 6 % hydrogen peroxide solution or 3 % chloramine solution, they can be used for 6 hours.

Small instruments (pulp extractors, etc.) are not reused, as they are disposable. New instruments are used after pre-sterilization treatment and sterilization.

Used disposable small instruments are soaked in 20 % milk of bleach or 10 % calcium hypochloride solution or 3 % chloramine solution for 1 hour. After disinfection, they are disposed of in the trash.

Before and after use, the light guides to the photopolymerization lamps are thoroughly wiped twice with a sterile cloth moistened with 70% alcohol or 4 % Lysetol AF solution.

Brush holders used for restoration are disinfected in the same way. The brushes themselves are disposable and are disinfected and disposed of after use.

A sterile table is set up for sterile instruments according to certain rules. Before starting work, the room should be wet cleaned. After that, the nurse puts on a sterile gown, cap, mask, treats her hands, lays out sterile bix and covers the sterile table. She removes a sterile sheet from the sterile bix with a sterile clamp. The lower sheet is spread so that it hangs 20-30 cm below the table panel. The folded sheet is placed on top. Then remove the grid with the instruments from the sterilizer, place them on the instrument table on the folded sheet and lay them out in a certain sequence. The top sheet is fastened to the bottom sheet with clips at the back and sides. The front edge of the upper sheet is gripped by two clamps, which lift it up and thus provide access to the instruments. After the sterile table is covered, a label is attached to the table to indicate the date of covering.

The sterile instrument must not be picked up from the table by hand. This is done with sterile tweezers, which are placed in a sterile tray covered with a sterile napkin. The tweezers are changed every 3 hours. The sterile table is covered for 6 hours. The instrument is re-sterilized from the table without preliminary processing steps.

An alternative to the old method of placing medical instruments on the table using a sheet is modern Ultraviolet shelves or Aseptic boxes (Vidar, Vinnytsia) for long-term storage of sterile instruments and materials (up to 7 days), the principle of which is based on the bactericidal effect of ultraviolet light. The air recirculation in the Aseptic box enhances the bactericidal effect and minimizes the “dead zone” effect.

2.3. Questions (tests, tasks, clinical situations) to test knowledge on the topic of the lesson.

**Theoretical questions for the class:**

- “Sanitary and anti-epidemic regime”, main characteristics and its control.
- Asepsis and antisepsis. Methods of antisepsis.
- What is “disinfection”?
- Define the purpose of disinfection.
- What sections of disinfection do you know?
- What types of disinfection do you know? Explain their essence.
- What methods of disinfection do you know? Explain the essence of these methods.
- Name the categories of risk of infectious lesions in contact with environmental factors and the recommended levels of their disinfection.
- What chemicals are used for disinfection in pediatric dentistry? Determine their effect on microorganisms.
- What is “pre-sterilization cleaning”?
- What methods of pre-sterilization cleaning do you know?
- What stages of manual pre-sterilization cleaning do you know? Explain their essence.
- Name the main methods of mechanized method of pre-sterilization cleaning and reveal the essence of each of them.
- Name the means and modes of disinfection and pre-sterilization cleaning, combined in one stage - pre-sterilization cleaning.
- What are the main methods of quality control of pre-sterilization cleaning you know? Explain the essence of each test.
- The definition of “sterilization”.
- Methods of sterilization.
- Air sterilization method: devices, modes, quality control.
- Steam method of sterilization: devices, modes, quality control.
- Chemical method of sterilization: devices, means.



- Method of sterilization by ionizing radiation and boiling.
- Glasperlen sterilizer.
- Conditions and shelf life of sterile instruments and materials.
- Processing of instruments in the dental office.
- Processing of equipment in the dental office.
- Processing of reusable instruments in the dental office.
- The purpose of the Terminator and Assistina devices.
- Cleaning the premises in the dental department.
- Current disinfection.
- General cleaning.
- Name the purpose, storage rules and methods of processing of medical clothing.
- Name the purpose, rules of use and methods of processing rubber gloves.
- Name the purpose and rules of use of protective masks.
- Name the purpose and methods of processing of protective shields.
- Name the purpose and methods of processing of protective and light-protective glasses.
- Explain the essence of measures to prevent infection of medical personnel in the performance of their professional duties.
- Name the rules for preventing infection of a health care worker and a patient during dental procedures.
- Name the main methods of cleaning the skin of the hands and reveal the essence of each of them.
- Name the composition and rules of use of the first aid kit for emergency medical care for health care workers in health care facilities.
- Explain the essence of the specific prevention of parenterally transmitted infections.
- Explain the essence of measures in case of suspicion and occurrence of quarantine infections.
- Name the responsibilities of the nurse in identifying a patient with suspected quarantine infections.

**Practical work (tasks) performed in class:**

- Be able to disinfect by physical, chemical and combined methods.
- Be able to determine the risk categories of infectious lesions in contact with environmental factors and recommend levels of disinfection.
- Be able to carry out pre-sterilization cleaning by hand and by each

of the mechanized (jet, rotary, scouring, using ultrasound) methods.

- Be able to carry out quality control of pre-sterilization cleaning (tests: Azopyramid, phenolphthalein, with Sudan III).
- To sterilize dental instruments by air.
- To sterilize dental instruments by steam method.
- To sterilize dental instruments by chemical method.
- To sterilize dental instruments in a glasperlene sterilizer.
- Organize the storage of sterile instruments and materials.
- To process the instruments in the dental office.
- To process the equipment in the dental office.
- To process reusable instruments in the dental office.
- Organize cleaning of the premises in the dental department.
- Be able to process medical workwear.
- Be able to process rubber gloves.
- Be able to process protective shields.
- To be able to process protective and light protection goggles.
- Be able to cleanse the skin of the hands by various methods.
- To be able to determine the sequence of actions in case of emergency medical care for medical workers of health care institutions.
- Be able to determine the sequence of actions in case of suspicion and occurrence of hospital-acquired and quarantine infections.

3. Formation of professional skills (mastering skills, supervision, determining treatment regimens, conducting laboratory tests, etc.)

4. Summarizing the results is carried out at the end of the practical training. Assessment of the level of knowledge of higher education students is carried out on a 4-point scale. The final grade for a practical lesson includes such components as assessment of theoretical knowledge on the topic of the lesson, assessment of practical skills and manipulations with mandatory announcements to students. The grade for one practical lesson is the arithmetic mean of all components and can only have an integer value (5, 4, 3, 2), which is rounded according to the statistical method.

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1. Patient care and medical manipulation technique: study guide / edited by L.M. Kovalchuk, O.V. Kononov. – 3rd ed., revised. and added Kyiv: AUSPH “Medicine”, 2017. - 600 p.

*Electronic information resources:*

1. Website of the Association of Dentists of Ukraine. <http://www.udenta.org.ua>

2. Website of the National Institute of Health. <http://www.nih.gov>

# FOR NOTES

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Метою даної методичної розробки є підготовка здобувачів вищої освіти до професійної діяльності на посаді медичної сестри дитячого відділення стоматологічної клініки — оволодіння навичками організації робочого графіка, виконання основних стоматологічних маніпуляцій, заповнення звітної документації, обробки стоматологічного інструментарію та обладнання тощо для поглиблення теоретичних знань і професійних компетенцій.

Для здобувачів вищої освіти стоматологічного факультету.

Навчальне видання

## **СЕСТРИНСЬКА ПРАКТИКА В ДИТЯЧІЙ СТОМАТОЛОГІЇ**

Методична розробка  
до практичних занять  
з навчальної дисципліни

*Англійською мовою*

**Укладачі:**

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