Саратовский государственный
медицинский университет
имени В. И. Разумовского

Discipline: "Propaedeutics of dental diseases and materials science"

Basic dental instrumentation

Department of propaedeutics
dental diseases

Lecture plan:

1. Viewing set. The main tools included in the viewing kit. Their purpose.
2. Tools used in therapeutic dentistry.
3. Tools used in surgical dentistry.
4. Instruments used in orthopedic dentistry.

Dental instruments

are designed to ensure technological, efficient and safe performance of all medical diagnostic and preventive dental procedures.

1. Viewing set. The main tools included in the viewing kit. Their purpose.

The examination set of a dentist includes tools intended for the initial examination of a patient:

- dental mirror;
- dental probe;
- dental tweezers.

Dental mirror

Dental mirror is a round, usually one-way mirror with a diameter of 22-24 mm in a metal frame, screwed into the handle.

Dental mirrors come in two types: concave, which magnifies the image, and flat, which gives a real, undistorted image. The working part is made independently of the handle and is attached to it with a thread directly in the dental office.

The dental mirror is intended for the following manipulations:

- additional illumination of darkened areas of the oral cavity;
- inspection of areas inaccessible to direct observation;
- abduction of the cheeks and tongue when examining the patient's oral cavity;
- abduction and protection of soft tissues of the oral cavity during preparation and other manipulations.

Dental probe

The dental probe (pointed probe) is a multifunctional diagnostic tool.

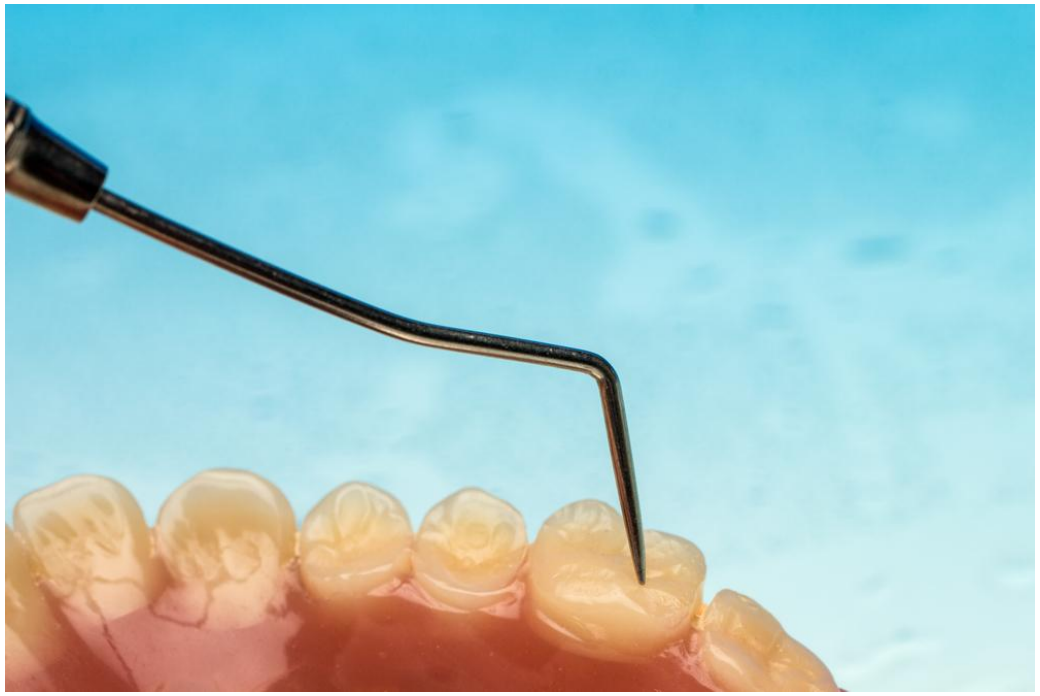
The most commonly used in dentistry is the angled probe. The working part of this probe is thin, round in cross section, bent at an angle and ends with a sharp tip.

The handle is small and light for improved tactile sensitivity. Probes are single-sided or double-sided, may have a different configuration of the working part.

Зонд общего обследования

Appointment of pointed dental probes:

- detection of carious cavities, demineralized dentin, areas of soreness of hard tissues of the tooth during mechanical action (probing);
- assessment of the condition of the fissures of the teeth, the presence of areas of carious lesions in them ("jamming" of the probe);
- detection of the presence of communication between the carious cavity and the tooth cavity, detection of the mouths of root canals, perforations, cracks;

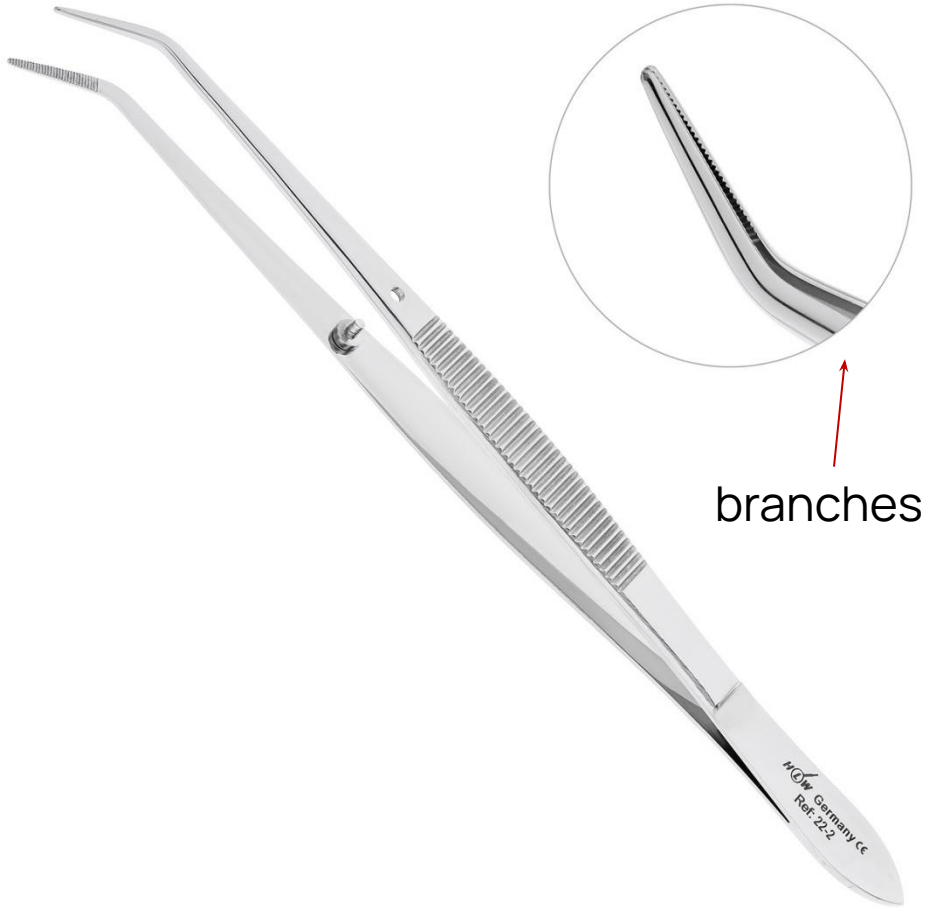


Appointment of pointed dental probes:

- detection of supragingival dental deposits;
- introduction into the cavity and distribution along the bottom and walls of medical and filling materials of a fluid consistency;
- the introduction of drugs into the cavity with the help of a cotton turunda wound on the working part of the probe.
- the handle of the probe can be percussion - tapping on the cutting edge or chewing surface of the tooth.

Dental tweezers

Dental tweezers have branches (cheeks) curved at an angle of 115-120°, the inner side of which can be smooth or has notches. Tweezers are made of spring steel.



Purpose of dental tweezers:

- retention and transfer of cotton rolls, retraction threads and other objects into and out of the oral cavity;
- the introduction of drugs into the carious cavity or cavity of the tooth either on a cotton ball or between the branches of the tweezers;
- holding and carrying small dental instruments and pins;
- determination of the degree of tooth mobility;

The tweezer handle can be used as a spatula to push back cheeks, lips, or percussion teeth.

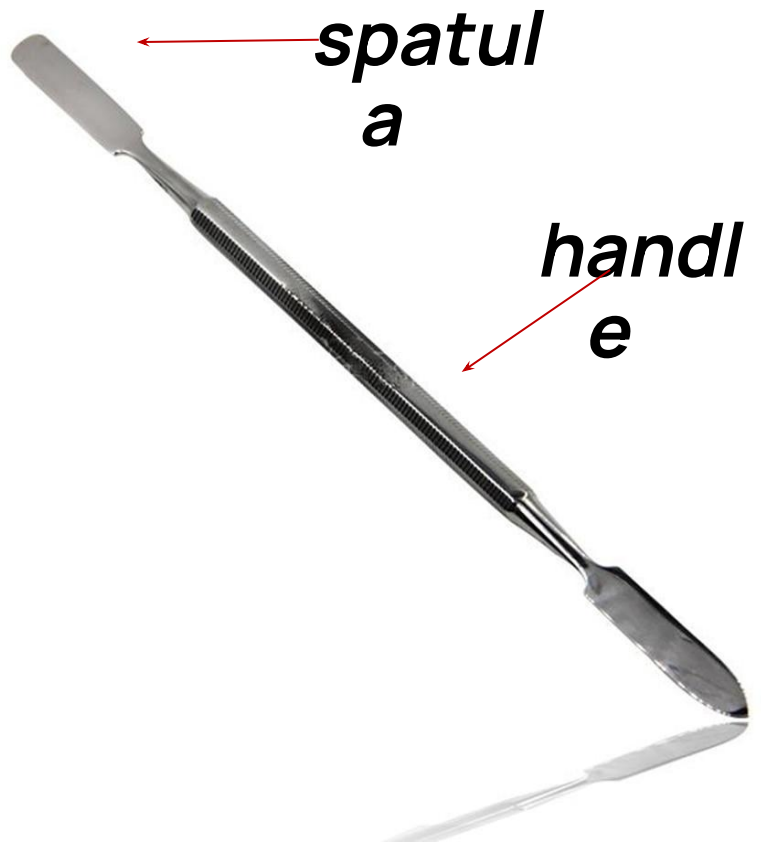
Notches on the jaws of the tweezers contribute to better fixation (capture) of the material.

2. INSTRUMENTS USED IN THERAPEUTIC DENTISTRY

Mixing of filling materials, medical pastes and gaskets is carried out with a metal or plastic spatula on a special surface.

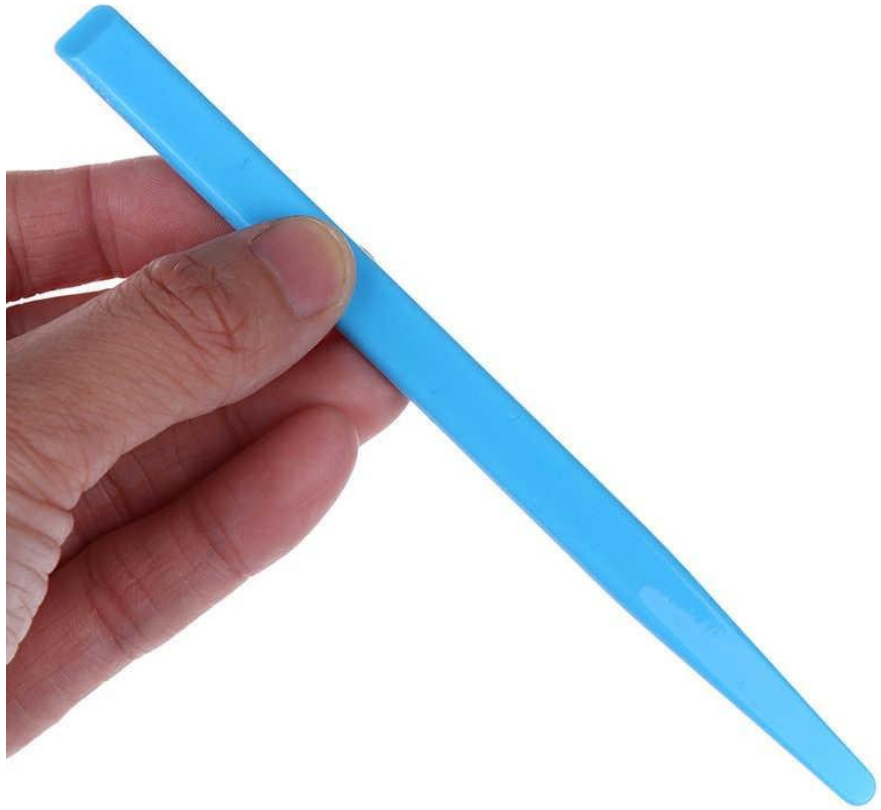
Metal spatula

A metal spatula consists of a handle, at both ends of which there are elongated straight spatulas. A metal spatula is more convenient to use than a plastic one.



Plastic spatulas

Plastic spatulas are used to prepare medicinal pastes and to mix filling materials that become inactivated or change color when in contact with metals (for example, silicate cements, some composites). Plastic spatulas are disposable.



The following devices are used as a mixing surface:

- glass plates, one side of which is smooth, the other is rough;
- paper notebooks for kneading, made of special thick, waterproof paper. Sheets in such notebooks are disposable;
- special silicone plates for kneading, chemically inert and non-absorbent components of the kneaded materials.

glass plates

Paper notebooks

A number of requirements are imposed on the instruments used for filling cavities:

- The instrument must be ergonomic, easy to clean and sterilize.
- The working part of the tool must be durable and resistant to abrasive, mechanical and chemical influences.
- The color of the working part of the instrument should contrast against the background of the filling material, tooth tissues and oral mucosa.
- The working part of the tool should not shine, give glare.

Filling materials should not stick to the surface of the working part of the instrument.

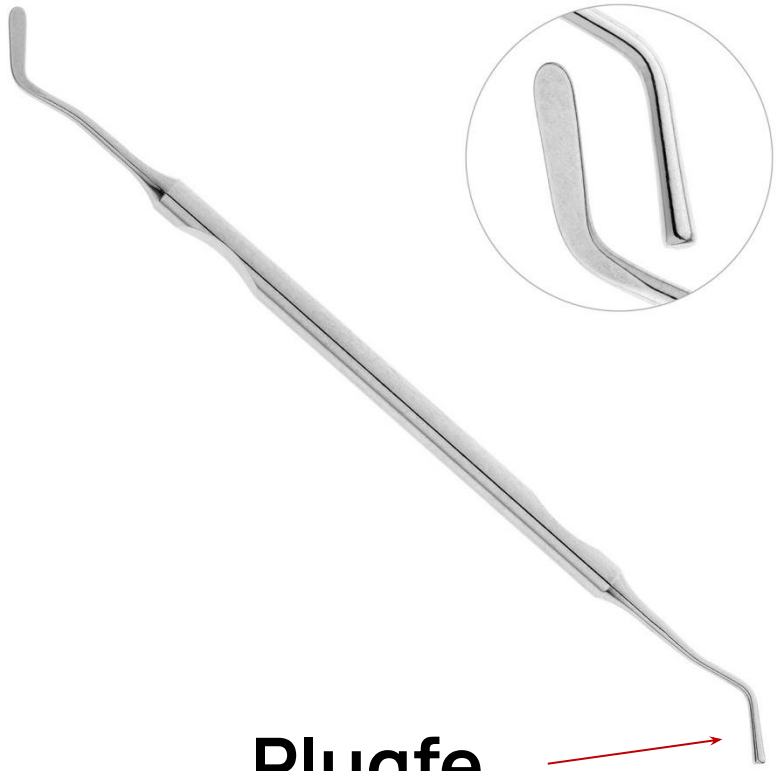
The most common tools in this group are trowels and pluggers.

Dental trowel

A trowel is a dental tool with a working part in the form of a short plate of a straight or curved shape, located at a certain angle with respect to the handle. Using a trowel, paste-like drugs, filling materials for gaskets, temporary and permanent fillings are introduced into the cavities, and the surface of the filling is modeled.

Plugfer

Plugfer - a dental instrument with a working part of a spherical, pear-shaped, cylindrical, olive-shaped or other similar shape. To work with cements and composites, pluggers with a smooth working part are used. Pluggers with additional notches on the working part are used for filling with amalgams and condensable composite materials.



Plugfe
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Plugfers are conditionally divided into condensing and modeling

Condensing pluggers have the shape of a working part, which makes it possible to carry out compaction (condensation) of the material in the cavity with maximum efficiency.

Modeling pluggers have a working part designed to model the surface layer of the restoration, create the contours of fissures, masticatory tubercles, marginal ridges, ridges and depressions on the surface of the tooth crown.

Condensing pluggers

Modeling pluggers

Pluggers and floaters are available in various sizes, single-sided, double-sided, and also as a combination of a floater with a plugger.

1304
Штопфер-гладилка большая

1502
Штопфер-гладилка средняя для дозирования , внесения в полость и начального моделирования композитов (средние кариозные полости)

Dental excavator

It is used to remove softened dentin, food debris, temporary filling material.

There are complete sets of standard instruments for periodontal examination, for example, the set described by Müller H.-P. [2004]. The set consists of six tools.

It includes:

- Flat dental mirror with a diameter of 22 mm;
- Dental tweezers;
- 4 probes:

1. Bilateral "probe-hook" - for the study of carious cavities and the detection of subgingival dental deposits,
2. WHO probe (with rounded end),
3. Probe for furcations (Nabers probe calibrated to a step depth of 3 mm),
4. Graduated probe (periodontometer - calibration by 1 mm or 3-3-2-3 mm).

Periodontal probe

A periodontal probe is a special probe with a measuring scale. Using this probe, it is possible to determine with high accuracy the depth of the pocket, the degree of bleeding of the gums, to assess the root surfaces of the tooth, the furcations of the molars and to identify the presence of subgingival dental deposits.

3. INSTRUMENTS USED IN SURGICAL DENTISTRY

Forceps and elevators for extraction of teeth

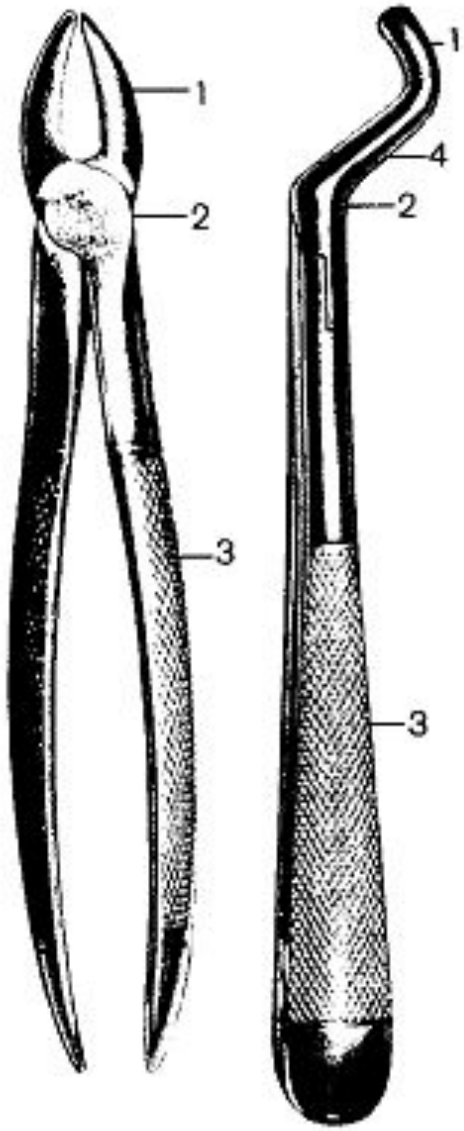
Forceps

When removing teeth, the principle of the lever is used.

In forceps for removing teeth and roots, there are:

1. Cheeks;
2. Castle
3. Handles;

Some forceps have a transitional part (4) between the jaws and the lock.



Cheeks are designed to grip the crown or root of the tooth.

Handles - part of the forceps, for which they are held and to which force is applied during the operation.

The lock is located between the cheeks and handles, serves for their movable connection.

For better retention of a tooth or root, the cheeks on the inside have a groove with fine longitudinal cutting. The outer surface of the handles is corrugated for a considerable length, the inner surface is smooth. The design of forceps depends on the anatomical structure of the tooth and its place in the dentition.

There are the following types of forceps:

1. Forceps for removing teeth and roots of the upper and lower jaws.

   In forceps for extracting teeth of the upper jaw, the longitudinal axis of the cheeks and the axis of the handles coincide, or are parallel, or form an obtuse angle approaching two right angles. In forceps for extracting teeth of the lower jaw, the cheeks and handles are located at a right angle or at an angle approaching a right one.

2. Forceps for extracting teeth with a preserved crown (crown) and for removing roots (root).

The cheeks of the forceps for removing teeth with a crown do not converge when closing, for removing roots they converge.

3. Forceps for removing individual groups of teeth of the upper and lower jaws.

They differ in the width and features of the structure of the cheeks, their location in relation to the handles, the shape of the handles.

4. Forceps for removing the first and second large molars of the upper jaw on the right and left.

The left and right cheeks of these forceps are arranged differently.

5. Forceps for the extraction of teeth of the lower jaw with limited mouth opening.

They have a bend of the cheeks in the horizontal plane.

To successfully perform the operation, forceps should be used, the design of which corresponds to the anatomical features of the tooth being removed.

The removal of the central incisor, lateral incisor and canine of the upper jaw is carried out with forceps that have a straight shape - straight forceps. The longitudinal axes of the cheeks and handles are in the same plane and coincide. Both cheeks are of the same shape, on the inside they have a recess (groove), the ends are rounded. Forceps may have cheeks of greater or lesser width.

Removal of small molars of the upper jaw is carried out with forceps having an S-shaped bend. Their cheeks are located at an obtuse angle to the handles.

Removal of large molars of the upper jaw is performed with forceps having an S-shaped bend and similar in shape to forceps for removing small molars. However, their cheeks are arranged differently. They are shorter and wider, the distance between them in the closed state is greater. Both cheeks on the inside have recesses.

At one cheek, the end is semicircular or flat, at the other it ends with a protrusion (thorn), from which a small ridge extends along the middle of the inner surface. When a tooth is removed, the spike enters between the buccal roots, a cheek with a flat end covers the neck of the tooth from the palatal side. Some forceps have a cheek with a spike on the right side, others - on the left. Depending on this, a spike is distinguished for removing teeth on the right or left side.

Removal of the third large molar of the upper jaw is performed with special forceps. Between the cheeks and the lock, they have a transitional part. The longitudinal axis of the cheeks and the axis of the handles are parallel. Both cheeks are the same: wide, with a thin and rounded end at the edges. On the inside, they have recesses; when the forceps are closed, the cheeks do not converge. The design of the forceps makes it possible to insert them deep into the oral cavity, while the lower jaw does not interfere with the operation.

The roots of the incisors, canine and premolars of the upper jaw are removed with the same forceps as the teeth, only with thinner and narrower cheeks that converge when closed. To remove the roots of large molars, bayonet-shaped forceps are used. They have a transitional part, from which long converging cheeks extend with a thin semicircular end and a groove along the entire inner surface. The longitudinal axis of the cheeks and the axis of the handles are parallel.

Removal of the teeth and roots of the lower jaw is carried out with forceps, curved along the edge and having a beak-shaped shape. The axis of the cheeks and the axis of the handles form a right angle or close to it. All components of the tongs are located in a vertical plane, the handles are one above the other. Depending on the shape of the crown of the removed tooth and the number of its roots, the cheeks of the forceps have a different structure

To remove the incisors of the lower jaw, the cheeks of the forceps are narrow with grooves on the inside, their end is rounded, and they do not converge when closed. The canine and small molars are removed with the same forceps, but with wider cheeks.

Forceps for removing large molars have wide cheeks that do not converge when closing. Each of them ends with a triangular protrusion (thorn). On the inside, both cheeks have recesses. When applied to the tooth, the protrusions enter the groove between the anterior and posterior roots, ensuring good fixation of the forceps on the tooth.

The roots of all the teeth of the lower jaw are removed with forceps of the same shape as the incisors, canines and small molars, only with converging cheeks.

Elevators

When removing teeth with an elevator, as well as with forceps, the principle of a lever is used. The elevator consists of three parts: the working part, the connecting rod and the handle.

There are many different designs of elevators, but three types are most common:

1. Straight;
2. corner elevator;
3. Bayonet elevator.

Straight elevator

Elevators

Corner elevator

Bayonet elevator

4. INSTRUMENTS USED IN ORTHOPEDIC DENTISTRY

Instruments used to prepare and process orthopedic consumables

Spatula

Metal and plastic spatulas are used for mixing water suspensions of alginate and silicone impression masses and copper and some gypsum to the required consistency, as well as for their portionwise movement and preliminary design in impression trays. They produce flat and plane-curved instruments with one-sided and two-sided arrangement of the working part, while the rigidity and area of the working part may vary depending on the model.

Metal spatula

Knives for making impressions of plaster models

In orthopedic dentistry, modeling knives are used to finish (remove excess) crystallized gypsum and design a polymerized impression mass. Knives for processing plaster models have a hard blade and a metal plate on the end part, designed to open the cuvettes.

Wax knives

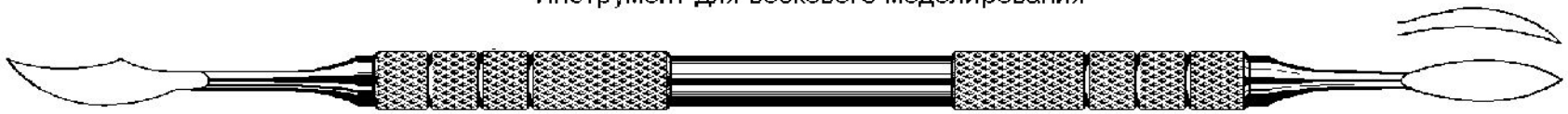
For batch separation of wax, its heat treatment and modeling, wax knives are used, having a cutting part (blade) and a modeling part (spatula).

The handle of a wax knife is made of a thermally insulating material, since pre-heating of the tool is necessary to process the wax and give it plastic properties. The working part of the wax knife can be flat or have a recess for heating the wax over the flame of an alcohol or gas burner.

Инструмент для воскового моделирования

1401
Нож для воска

Инструмент для воскового моделирования



1403
Восковой шпатель

Tools used to remove prosthetic structures

Forceps

To remove fixed structures fixed on the teeth of the upper jaw, forceps with an S-shaped bend of the cheeks and handles are used; perform debonding in the lower jaw area using forceps curved along the rib or along the plane. To remove cone-shaped telescopic crowns from the working model at the stage of their laboratory production, as well as during debonding in the oral cavity, forceps with divergent necks covered with retention notches or sintered diamond chips are used.

Elevators

Orthopedic elevators used to remove prosthetic structures have a flattened working part placed behind the gingival edge of the crown to transfer the leverage generated by the rotation of the instrument handle. The working part, depending on the location of the structure support, can be oriented longitudinally or perpendicularly to the long axis of the tool. In universal elevators, the working part has a cruciform shape for working in the frontal and lateral segments of the jaws.

Crown Removers

Crown removers that directly transmit manual force are used at the final stages of debonding or with a small fixation force of orthopedic structures. The body of such instruments, among which the Treimann crown remover is the most famous, consists of a handle with a bend on the back side, a connecting rod and a working part that ensures the retention of the instrument in the gingival part of the prosthesis.

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Lecturer
Kobzeva Julia Alexandrovna
Associate Professor of the Department of Propaedeutics of Dental Diseases,
Candidate of Medical Sciences

uakobzeva@gmail.ru