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CONTENT

TOOTH ROOT GROWTH

The theory of tooth root growth is based on the idea that the lengthening root rests against the bottom of the alveoli and causes the emergence of a force that pushes the tooth vertically.

This theory has a number of serious objections. It has been established that some teeth, when erupting, make a path that is much longer than their root in length. In addition, the pressure of the root on the bottom of the alveoli will inevitably cause resorption of bone tissue, as a result of which the bone will be unable to provide the necessary support for the repulsive tooth. This theory does not explain the complex movements that make the rudiments of some teeth in the jaw before the start of their eruption, as well as the facts of eruption of teeth with an unformed root.

Topic 2: The eruption of baby teeth in the normal and pathological eruption.

The buds of deciduous teeth are formed in the first weeks of intrauterine life. Mineral salts begin to be deposited in the organic deposit from the fifth month, so that at birth the crowns of deciduous teeth differ in differently developed stage of calcification.

The deposits for permanent teeth are formed during the fetal period (incisors, canines, first molars) and after birth. The eruption of permanent teeth occurs over a long period of time, beginning at age five and ending at age fifteen, in the following order: F, 1), B, 4), C, 5), 7. The wisdom teeth do not erupt until after age 18

When the permanent tooth bud advances in the occlusal direction, the roots of the baby teeth will also disappear. Biologically, this can be compared to the process of a physiological bone remodeling.

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histologically, both processes are similar. Resorption is noted first of all where the crown of the replacement permanent tooth is adjacent to the milk tooth.

Topic 3: Teething in the normal and pathological eruption of milk and permanent teeth.

The deposits for permanent teeth are formed during prenatal life (incisors, canines, first molars) and after birth. The eruption of permanent teeth occurs over a long period of time, beginning at age five and ending at age fifteen, in the following order: F, 1), B, 4), C, 5), 7. Wisdom teeth do not erupt until after age 18. According to statistics, also in a permanent bite, the lower teeth

erupt earlier than the upper ones. Premolars are a frequent exception. Closure of the root apex occurs 2-3 years after eruption. Until then, we talk about a tooth with incomplete development. The development of the permanent tooth continues for almost ten years. During the period of tooth replacement, when milk and permanent teeth are temporarily in the oral cavity, we talk about a changeable bite. The buds of permanent incisors - both upper and lower - are placed in the jaws in a coulter-like manner. The fact is that their crowns are much larger in size than their

predecessors, so that in small children's jaws is not enough space for them. Therefore, in the early period of age, the wobbly position of the incisor buds is a completely normal phenomenon, and no assumptions about future anomalies can be made on the basis of this phenomenon. With the eruption of the permanent teeth, the jaw grows in most cases so that there is enough space for the incisors later on. The germs of the canines are always placed relatively deep in the jaw and there is not enough space for them. However, here also normalization occurs with age, and therefore the diagnosis of a retained tooth should not be made rashly. The premolar buds are initially located orally, and only at a later period do they take up space between the roots of the milk molars. Molar buds are noted in the early period of development, usually located in the ascending branch of the lower jaw or in the cusp of the upper jaw. With the developing growth of the jaws, the rudiment of the molar takes its permanent position. The only exception to this may be wisdom teeth which erupt at a time when the jaw growth is almost complete, so that the lack of space is a permanent situation. Tooth development, the formation and calcification of teeth rudiments, the migration of permanent tooth rudiments toward the surface, the resorption of roots of deciduous teeth, eruption, etc. - all these processes are inseparably connected with the general development of the organism. Impulses and regular sequence of these processes are regulated centrally and subject to neurohumoral control. Therefore, any disturbance representing an unfavorable interference in the metabolism or hormonal coherence of the organism may result in a disruption of the teeth of development. Based on the time distribution of the individual phases of dental development, the nature of the disorder and the timing of its occurrence can be approximated.

Theme 4: Algorithm of the examination of the child.

The purpose of clinical examination of the patient is to diagnose the disease necessary for successful treatment. To confirm the initial diagnosis and differential diagnosis general and systemic examination of the patient is carried out. An obligatory condition for achieving the goal is the collection of factual material. Different methods are used in dentistry, which are divided into the main ones:

- Questioning the patient (anamnesis collection);
- Interviewing the patient's close relatives (if necessary);
- Examination (external examination, examination of the oral cavity: the vestibule of the mouth and the cavity itself), and additional (auxiliary):
- temperature diagnosis;
- Electrodontodiagnostics (EDD);
- electrometric diagnostics;
- X-ray diagnosis;
- laboratory methods;
- functional methods of examination. The questioning starts with finding out the complaints, which often allow you to immediately suspect a particular disease. You can ask questions, but it is better to ask the patient to tell you what is bothering him at the moment, what the first manifestations of the disease are, and what the causes of pain are. A lot of popular medical literature and advertising makes patients informed, and their answers can be filled with diagnoses of various

diseases. It is not the disease diagnoses that are important here, but the subjective sensations. In terms of informativeness, there are major and minor complaints. Major complaints are important symptoms of the disease, and indicate to some extent the localization of the process.

Topic 5: Methods of examination of oral organs and systems in children.

Methods of examination of the dental patient. Getting acquainted with the child and parents, collecting complaints and anamnesis can be carried out outside the dental chair. The clinical examination of the patient is aimed at making a diagnosis. It consists of identifying the patient's complaints, medical history, assessment of local status, and general symptoms. Interrogation or anamnesis, should be conducted taking into account the age of the child, many questions we do not address the children themselves, and their parents, regardless of the age of the child. Talking to the child should be done in an atmosphere that encourages him or her to talk frankly about everything that is bothering him or her. Gathering a medical history it is necessary to find out: when the first signs of illness appeared, whether you went to the doctor or did something at home, what tests were conducted, what treatment was prescribed, its effectiveness, respectively. Then begin with the identification of complaints at the time of treatment. In this case, find out the nature, duration, intensity of pain, the duration and cause of their occurrence. It must be remembered that small children are not able to express their feelings accurately, and parents are not always aware of what happened to their child during the day at the day care center, at their grandmother's or babysitter's. Preschoolers and schoolchildren may make up complaints or, on the contrary, hide them out of fear of the upcoming treatment. Therefore, the pediatric dentist often has to rely more on objective examination data than on information from children and their relatives. The medical history is the basic information about the child's life that is established by interviewing the child and his or her parents. Case histories help identify risk factors and causative factors for dental problems. The medical history may be aggravated or unaggravated. The anamnesis is considered aggravated when the factors that caused or contributed to the disease have been identified, genetic predisposition to the disease has been identified, other diseases of the child have been identified, nutritional and living conditions of the child have been violated, etc.

Topic 6: Modern methods of isolation of the oral cavity.

In modern dental practice specialists use cofferdam - a latex handkerchief to isolate the diseased tooth from the oral cavity. The technology replaces standard cotton rolls. There is no need to use "saliva ejector", the replacement of saliva soaked rollers and the use of gentle antiseptics for rinsing the prepared cavity (in order to avoid damage to the patient's oral mucosa in the case of aggressive, but more effective chemicals). Isolation of the working area from the oral cavity eliminates the penetration of harmful bacteria and infections, thus improving the quality of treatment and reducing the incidence of retreatment of pulp teeth.

The use of cofferdam has the following objectives:

1. maintain sterility and dryness of the working surface, i.e. saliva and blood must not enter the teeth and root canals;
2. preventing the patient from swallowing medications, dental instruments, restorative material, possible pathogenic bacteria breeding in the pulp thickness;
3. protection of the field of dental manipulation from contact with the tongue and the inner surface of the cheeks;
4. improving the visibility of the treated tooth;
5. easier access to problematic areas;
6. prevention of possible fogging of the dental mirror.

Topic 7: Development of anomalies of the dento-alveolar system as a consequence of bad habits.

One of the reasons for the emergence and development of dentoalveolar anomalies and deformities of the facial skeleton is bad habits, as well as disorders of swallowing and lip-clamping functions. In a number of children, these problems arise due to various concomitant diseases, in particular, ENT-pathology, as well as some neurological disorders.

The following types of bad habits are distinguished:

- Finger sucking;
- Sucking foreign objects;
- prolonged use of a pacifier;
- biting the lips, cheeks;
- Putting the tongue between the teeth during swallowing, speech, etc.

The untimely detection and correction of the above-mentioned disorders leads to the development of dento-alveolar anomalies already in the early preschool age, and only gets worse with the years, complicating the ways of their elimination.

Special mention should be made of such a risk factor as disorders of swallowing, nasal breathing, chewing, and speech. This is often observed in children exposed to frequent colds, unable to breathe through the nose and walk with closed lips.

The child's life, etc.

Topic 8: Conducting basic radiation diagnostics in pediatric dentistry.

Despite the emergence of new radiological diagnostic methods, classical radiography remains the main method of diagnosing diseases of the maxillofacial region. Methods of X-ray diagnostics found a wide application in practice of therapeutic dentistry (for peri- and periodontal diseases detection); in prosthetic dentistry (for evaluation of the state of the remaining teeth, periapical tissues, periodontium, which defines the choice of prosthetic measures). Radiological methods are indispensable for maxillofacial surgery in diagnosing traumatic injuries, inflammatory diseases, cysts, tumors and other pathological conditions. Technique and technique of X-ray examination of teeth and jaws has its own peculiarities. The following radiological methods are most commonly used in dental practice: intraoral radiography, extraoral radiography, review radiography, long-focus radiography. Intraoral radiography is performed using dental x-ray machines. Modern dental X-ray machines allow for both classic X-ray film images and images with digital sensors.

Topic 9: Measures to prevent dental diseases in children with disabilities.

The peculiarity of dental care for children with disabilities is that they require special preparation before treatment. In addition, while devoting all their energy to fighting a child's underlying disease, parents often delay going to the pediatric dentist, resulting in the development of multiple complicated caries, a disease that requires complex treatment. Some pediatric dentists are unable to provide full dental care because their workplaces are not properly equipped. For example, to treat children with intellectual disabilities, in most cases it is only possible to provide skilled dental care under general anesthesia.

Knowledge of the characteristics and needs of children with disabilities allows the dentists at our dental clinic to provide the highest quality and most comfortable treatment.

Improving the quality of dental care for children with disabilities is one of the most important tasks of dentistry, because many of these patients
today are deprived of adequate dental care.

The theory of teething

The mechanism of teething is very complex and poorly understood. Most theories view tooth eruption as a local process. These include the theory that the tooth is pushed out by the developing and growing root or by the developing hole as a result of the deposition of bone bars at the bottom of the hole. According to G. Jasvoin, the cause of tooth eruption lies in the differentiation of the dental papilla and its transformation into a dental pulp, in which the volume of the connective-tissue formation increases due to the growth of the amount of basic substance. This creates the force within the dental rudiment that propels it to the gum surface.

The pulp theory is contradicted by the fact that a tooth with a damaged pulp erupts. The root theory of tooth eruption is refuted by a number of clinical facts, such as the delay of individual teeth in the jaw with formed roots (the phenomenon of tooth retention), the longer path that the crown of a canine tooth travels compared to the length of its root, etc.

Without denying in the mechanism of tooth eruption the fact of bone proliferation on the bottom of a dental socket and increase of intramaxillary pressure, A.J. Katz points out the leading role of processes of reconstruction of the alveolar ridge bone surrounding an erupting tooth. The resorption of bone tissue on the inner surface of the alveolar ridge margin, which is caused by the pressure of the growing dental rudiment, creates, according to this author, a weakening of resistance to the erupting tooth.

In the opinion of E. E. Platonov and A.I. Rybakov, the specified reasons can be not the independent factors, but only separate moments in the complex complex mechanism of teething, which is caused by development of a tooth rudiment and the tissues surrounding it, connected with development and life of all organism. Clinical and experimental observations confirm the great influence of neurohumoral factors on this process.

The process of eruption of permanent teeth (incisors, canines and premolars) occurs after the resorption of the roots of temporary teeth is completed. In the process of growth and development of the rudiment of the permanent tooth, at the expense of osteoclasts, there is a destruction of the bone septum that separates it from the root of the temporary tooth. The osteoclastic type of destruction of cementum and dentin is also noted in the resorption of the root of the temporary tooth itself, which is observed long before the beginning of eruption of the corresponding permanent tooth (Fig.8). The timing of the resorption of the roots of temporary teeth is shown in the diagram (Fig.9).

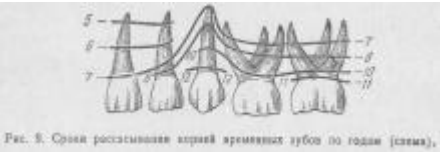


Рис. 9. Сроки рассасывания корней временных зубов по годам (схема).

It has been established that simultaneously with the destruction of the hard tissues of the root of the temporary tooth the process of partial restoration of its cementum and dentin by newly formed tissue at the expense of cementoblasts and osteoblasts takes place. However, resorption prevails over the reparative process, as it proceeds more actively and simultaneously on both sides. In addition to the destruction of dentin by periodontal osteoclasts, it is also destroyed by the same cells on the pulp side, which turns into granulation tissue by this period. The final formation of the roots of permanent teeth occurs within 3-4 years after the eruption of the crowns of permanent teeth and can be reliably established only on the X-ray.

Knowledge of the timing of formation of the roots of temporary and permanent teeth, as well as the timing of resorption of the roots of temporary teeth, is necessary for the clinician to correctly guide the choice of treatment for these teeth, especially pulpitis and periodontitis.

1. Hunter's root theory - the growing roots of the tooth rest against the hard bone bottom of the bone alveolus and the tooth is pushed out of the bone alveolus.
2. Jasvoin's theory - compares the tooth to a rocket.
3. the Katz theory - the growing tooth presses on the lateral walls of the alveoli, which leads to superficial bone resorption; at the same time, new bone is deposited on the outer surface of the alveolar processes and on its upper edge. Bone tissue is deposited in the area of the bottom of the alveolus, which leads to an increase in tissue pressure there, pushing the tooth to the surface.

Histological structure of the tooth. A tooth is distinguished between a crown, a neck, and a root. There is a concept of an anatomical crown and a clinical crown.

The anatomical crown is the part of the tooth that protrudes above the gums into the oral cavity and is covered by enamel. Clinical crown - the part of the tooth that protrudes into the oral cavity and is not covered by gum. The anatomic and clinical crown in childhood and young adulthood correspond to each other, but as we age, the gingiva moves downward and attaches itself to the cement of the root of the tooth. Therefore, the clinical crown becomes longer than the anatomic crown. The root of the tooth is the cemented part of the tooth. The boundary between the enamel and cement coating corresponds to the neck of the tooth.

Inside each tooth is a pulp cavity. The part of the pulp cavity in the crown area is called the pulp chamber, and the part in the root area is called the pulp or root canal. The entrance to the pulp cavity is at the apex of the root and is called the apical opening.

The aggregate of collagen fibers, one end embedded in the alveolar bone tissue and the other in the cementum, holds the tooth firmly in the bone alveoli and is called the periodontium. The periodontium and its associated adjacent tissues (dental alveolar bone tissue, gingival mucosa) together are called the periodontium. The paradontium, tooth, and adjacent gum together are called the dental organ.

Tooth enamel is the hardest tissue in the human body and only covers the crown of the tooth. Enamel consists of 96-97% inorganic substances (phosphates, carbonates and calcium fluorides), 3-4% organic substances (thin fibrils and adhesive mass). Inorganic substances form enamel prisms.

An enamel prism is an esiformly curved, polyhedral prism of calcium salt crystals. The enamel prisms are connected to each other by a network of thin fibrils and bonded together by an adhesive substance. After eruption, the thin film formed from the remnants of dead flattened outer cells of the enamel organ - the cuticle on the masticatory surfaces is erased. Mature enamel is inert, cell-free, and therefore incapable of regeneration when damaged. However, there is a minimal exchange of ions between the enamel and saliva, so that minimal additional calcification can occur on the enamel surface in the form of a film - pellicle. It is the accumulation of microorganisms, whose products of vital activity change the local pH to the acidic side, which in turn causes leaching of calcium salts, i.e. it can be the beginning of caries. When salts are deposited in the centers of plaque, tartar is formed.

Enamel bundles are a layer between enamel prisms of unexcavated organic matter; they are present near the enamel-dentine boundary. Enamel laminae are similar interlayers that penetrate the entire thickness of enamel; they are most abundant in the area of the neck of the tooth. Enamel bundles and laminae can be a gateway for microorganisms and the initial points of caries processes.

Enamel spindles are bulb-shaped thickening of odontoblasts that have reached the enamel-dentinus border and have penetrated the enamel. It is more often found in the area of the masseter cusps of molars and premolars.

Dentin covers both the crown and the root of the tooth. Like enamel, it consists of an inorganic part (70-72%) - calcium salts, and an organic part (28-30%). The organic part is produced by odontoblasts and consists of collagen fibers and bonding masses (mucoproteins).

The dentin is permeated with radially running tubules in which there are odontoblasts, mucosa-free nerve fibers and tissue fluid, i.e.

The dentinal tubules play a major role in dentin nutrition and innervation. The areas of dentin near the pulp are called peripulpal dentin and consist of calcified dentin. Peripheral layers (closer to the cement and enamel) are calcified capitate dentin. Bodies of odontoblasts lie in the peripheral part of the pulp (on the border with dentin). Dentin can regenerate, and less robust II dentin is formed after damage (collagen fibers are arranged haphazardly). Sometimes there is ectopic dentin formation, such as in the pulp - called denticles. The formation of denticles is considered to be caused by metabolic disorders, inflammatory processes, hypovitaminosis. The denticles can compress blood vessels and nerve fibers of the pulp.

Cement in its chemical composition and histological structure is similar to the coarse-fiber bone tissue. It consists of 70% inorganic calcium salts and 30% organic substances (collagen fibers, amorphous basic substance). Cement contains cementoblasts and cementocytes, which produce collagen fibers and basic substance. Cementoblasts and cementocytes are located closer to the apex of the

tooth root - this is a cellular cement; closer to the neck and crown of the tooth there are no cementoblasts and cementocytes - this is a cell-free cement. The cement is fed by the periodontal vessels, partially from the dentin side.
The pulp is a soft tissue of the tooth, located in the pulpal cavity. Histologically, the pulp corresponds to loose fibrous connective tissue with some features:
- more blood vessels;
- more nerve fibers and endings;
- more content of macrophages;
- does not contain elastic fibers.
In the peripheral part of the pulp (on the border with dentin) there are odontoblasts. The pulp provides nutrition for dentin and partly enamel and cementum, innervation of the tooth, protection against microorganisms.

MECHANISMS OF TOOTH ERUPTION

A significant number of theories have been proposed to explain the mechanisms of tooth eruption. Four of them deserve the most attention, in which the main mechanisms include: I) tooth root growth-, 2) increased hydrostatic pressure in the periapical zone or in the tooth pulp; 3) bone remodeling and 4) periodontal traction.

I. The theory of tooth root growth is based on the notion that the elongating root rests against the bottom of the alveolus and causes a force to push the tooth out vertically. This theory meets with a number of serious objections. For example, it has been established that some teeth, when erupting, make a path much longer than the size of their root. Moreover, the pressure of the root on the bottom of the alveolus will inevitably cause resorption of the bone tissue, so that it is unable to provide the support function postulated by the theory. This theory also does not explain the complex movements that the rudiments of some teeth make in the jaw before they start to erupt, and the facts of teeth erupting with an unformed root.

2 The hydrostatic pressure theory exists in two versions. According to the first one, tooth eruption is caused by an increase in the pressure of the tissue fluid in the periapical zone of its root. This creates a force that pushes the tooth in the direction of the oral cavity. Most researchers see the reason for the increase in hydrostatic pressure in the local increase in the blood supply to the periapical zone during development. Proponents of this option find indirect confirmation in the fact that the tooth makes oscillatory movements in the dental alveolus in accordance with the pulse wave. At the same time, surgical removal of the growing root along with the surrounding tissues and vessels does not prevent eruption.

The increase in periapical hydrostatic pressure can also be associated with increased vascular permeability, leading to fluid accumulation between the alveolar floor and the end of the root. The main carrier of liquid in this case is the main substance, which has high hydrophilicity. Accumulations of protein-containing tissue fluid under the root of an erupting tooth have been repeatedly found in histological preparations.

According to the second version of the hydrostatic pressure theory, the dental pulp that develops as a result of the differentiation of the dental papilla increases

dramatically in volume, especially in the area of the apex of the papilla, creating pressure inside the dental embryo. At the same time, the latter, like a rocket, moves to the free edge of the gingiva. From these positions, the formation of the root is not a cause, but a consequence of tooth eruption.

The theory of bone remodelling suggests that eruption is caused by a combination of selective deposition and resorption of bone in the alveolar wall. It is based on observations of the nature of alveolar remodeling that accompanies eruption (see above). It is assumed, in particular, that the bone growing at the bottom of the alveolus is capable of pushing the tooth towards the oral cavity. However, it is believed that the formation and resorption of bone around the root of an erupting tooth is a consequence, not the cause, of its eruption. Moreover, during eruption of some teeth there is a considerable distance between the apical part of the root and the bottom of the alveolus.

The theory of periodontal traction has gained considerable traction in recent years. According to its main position, the formation of the periodontium serves as the main

mechanism that ensures tooth eruption. According to one variant of this theory, periodontal traction is caused by collagen synthesis accompanied by fiber bundle shortening. Another variant points to the contractile activity of fibroblasts (myofibroblasts) of the periodontium as the leading mechanism of eruption (similar to the mechanism of contraction of a healing wound under the action of myofibroblasts). The contractile efforts of individual periodontal myofibroblasts are combined due to the presence of intercellular connections and, being transferred to collagen fibers, are transformed into a thrust, which ensures eruption. It has been suggested that this traction may not be created by the contraction of fibroblasts, but by their migration. The prerequisite for the correct application of traction in this variant of this hypothesis, as in the previous one, is an oblique arrangement of the periodontal fibers. A developmental disorder or damage to the periodontium stops the eruption of the tooth.

The fact that there are several theories of tooth eruption, briefly discussed above, clearly indicates that there is no single universal theory capable of providing a satisfactory explanation for the many pieces of evidence obtained in the study of normal tooth development and its various abnormalities. At the same time, the mechanisms postulated by various theories are not necessarily mutually exclusive - teething can be a multifactorial process in which the action of several mechanisms is combined.

Questions on the topic

1. At what period do the permanent teeth form?
2. The eruption of permanent teeth?
3. The eruption of baby teeth

Text

The upper lip is predominant over the lower lip, forming a lip step. The lips of the newborn are soft, swollen, trunk-shaped, transversely divided with a sucking cushion on the upper lip: due to this form the baby tightly covers the nipple. Deep lip and chin groove , chin tapered backwards .

Among the factors that contribute to sucking belongs also physiological children re-trogeny. In this case, the distance between the tops of the alveolar processes of the jaws Sagittal plane reaches 5-7 mm, and the vertical gap is 2.5-2.7 mm, its absence determines the development of a deep bite.

The vestibule and the floor of the mouth are shallow, the transitional folds are poorly expressed. The tongue is large.

The upper jaw consists of 2 - x symmetrical halves, which are combined late sutures. During early embryonic development, there is an intermandibular bone between the two parts.

The upper jaw of the newborn is broad and short, consisting mainly of the alveolar process, which is located just below the palate. The palate is flat with well-defined transverse folds.

There are usually 4-5 pairs of transverse folds on the palate, 2-3 pairs of which are derived from the palatal sagittal suture. Transverse folds create width of the mucosa and help to hold the nipple during feeding.

The maxillary cavity is only just outlined and appears as an oblong-shaped lumen on the radiograph. It is medial to the alveolar process. The tooth buds are located almost under the orbital cavity and are separated from it by a thin cystic plate.

The lower jaw consists of two halves, which are not fused together.

Connective tissue is used to connect the two halves. The alveolar process is better developed than the basal part. This is due to the presence of the rudiments of temporary and permanent teeth.

The mandibular canal has an almost rectilinear shape and is located close to the edge of the mandible. The branch of the mandible is almost undeveloped, and the articular process rises above the level of the alveolar process. The angle of the lower jaw to an average of 135° -140°.

Each jaw has 18 follicles, including 10 temporary and 8 permanent teeth (6321/1236) . The primitive teeth in both jaws are located on the maxillary side, the permanent teeth lie deeper than the temporary teeth on the lingual side of the lower jaw and on the palatine side of the upper jaw.

The gingival membrane is a double crestal mucosa fold of similar shape in the frontal area of the upper and lower jaw (Robin-Majit fold). It is rich in small papilla-shaped tubercles, vessels, due to which it is able to thicken. The gingival membrane also has a large number of elastic
fibers. This anatomical formation is clearly visible immediately after the baby stops suckling during feeding.
Newborns have a well-developed sucking function. Each feeding of the baby (for 30 minutes, 6 to 4 times a day) helps to train the lower jaw, masticatory and chewing muscles.

mimic muscles, tongue muscles every day for 3 hours. Therefore, improper feeding can lead to the development of bite anomalies.
The child swallows and breathes when swallowing, and this is due to the peculiarities of the topography of the larynx. The high location of the entrance to the larynx (above the level of the inferior - posterior edge of the soft palate) and its connection only to the oral cavity allows the child to breathe, suck and swallow simultaneously.
Features of the structure of the temporomandibular joint :
- The head of the articular process is almost round, has almost the same size (transversal and anteroposterior)
- The fossa, which is the seat of the mandibular head, is flat. It does not have an articular tubercle in front, but a well-defined articular cone at the back restricts the movements of the lower jaw toward the middle ear;
- The mandibular fossa is fully functional;
- Depth of mandibular fossa - no more than 2 mm ;
- The intraarticular disc in the newborn is a soft layer consisting of collagen fibers;
- Absence of villi of the synovial membrane of the joint capsule.
Absence of articular tubercle, occipital inclination of underdeveloped branch of the lower jaw, physiological retrogeneration, wide flat articular fossa, formed

intraarticular disk and articular cone create favorable conditions for movements of the lower jaw in the sagittal plane.
Teeth develop in close connection with the overall development and growth of the child. During the period of formation and growth are under the influence of various environmental and internal factors, which are reflected in the growth rate, degree of mineralization and timing of tooth eruption.
Development of temporary teeth
In the development of temporary (falling out, milk) teeth there are five periods:
1st - laying and intramandibular formation,
2nd - eruption,
3rd - root and periodontal formation;
4th - stabilization;
5th - resorption of the roots.
During the period of the establishment of the rudiments and intramandibular formation of teeth, their differentiation, histogenesis and calcification of the dental hard tissues take place.
The first signs of tooth development appear at 6-7 weeks of embryogenesis. Multilayered squamous epithelium of the oral fossa in the areas of future dental arches of the upper and lower jaws thickens and sinks into the mesenchyme. As a consequence of this process, vestibular (vestibular) and lingual plates are formed. The epithelial cells of the vestibular plate rapidly enlarge and then degenerate to form a gap separating the cheeks and lips from the area where the teeth later appear. In this way, the vestibule of the mouth emerges.
On the free edge of the lingual plate, cell proliferation promotes the appearance of epithelial outgrowths - dental papillae in places corresponding to the future temporary teeth. For temporary teeth, 10 of these formations emerge from the top and bottom, from which the enamel organs are later formed. In the 10th week of embryogenesis, mesenchyme begins to grow into each enamel organ, which forms the dental papilla. Around the epithelial dental organ and the dental papilla, there is a thickening of the mesenchyme covering the tooth rudiment and called the dental pouch. Thus, the enamel organ, dental papilla and dental sac together form the dental rudiment from which all the dental tissues are derived.
Having reached a certain degree of development, the tooth rudiment begins to separate from the dental plate, keeping its connection with it in the form of thin epithelial bands - the neck of the epithelial dental organ, which then resolves, and dental rudiments become isolated. This is where the first stage of tooth development ends. It is followed by the stage of differentiation of dental rudiments. During this period of dental development, important changes occur in both the dental buds and the tissues that surround them. At first, the enamel organ is homogeneous in structure - all cells are the same and arranged in layers. Subsequently, between the cells of the central part of the enamel organ begins to accumulate a proteinous fluid, which delaminates and pushes them away from each other. There remains a connection between them with the help of spurs. Due to this, the cells of the central part of the enamel organ become star-shaped and resemble the cells of reticular tissue. This area is called the enamel organ pulp or

stellate reticulum. The cells adjacent to the surface of the dental papilla form a layer of inner enamel cells. These are tall cylindrical-shaped cells, from which ameloblasts (enameloblasts, adamantoblasts), i.e. cells that form enamel, are later formed.

Along the edge of the enamel organ, the inner enamel cells change into outer enamel cells, which lie on the surface of the enamel organ and have a flat shape. The cells of the enamel organ are externally covered by a basal membrane called the enamel basal lamina, which separates the enamel epithelium from the surrounding mesenchyme.

Almost simultaneously, the process of differentiation of the dental papilla begins. It enlarges and grows even deeper into the enamel organ, blood vessels penetrate it. On the surface of the dental papilla several rows of closely spaced cells with dark basophilic cytoplasm, called dentinoblasts (odontoblasts), are formed from mesenchymal cells. The dentinoblast layer directly adjoins the inner enamel cells and is separated from them only by a thin basal membrane. Around the dental rudiments in the mesenchyme, bone beams continue to form for the alveolar wall.

An important moment at the stage of differentiation of dental rudiments is the curvature of the internal enamel epithelium, which determines the shape of the future tooth crown. It is at this stage that the influence of various unfavorable factors leads to defects in the development of the crown.

Cell differentiation of the enamel organ is regulated by growth factors, in particular insulin-like growth factor 1, transforming growth factor - p (TFR-p) and epidermal growth factor (EGF).

By the end of the 4th month of fetal development, the period of histogenesis of dental tissues begins, during which the dental tissues - dentin, enamel and pulp - emerge. Cement is formed later, in the 4-5th month of the post-embryonic period, when the development of the roots, followed by the eruption of teeth (Fig. 2 - dov. inset).

Dentin formation. Histogenesis of dental tissues begins with the formation of dentin. Dentinoblasts take an active part in this process. These cells form
thin precollagen fibers, which later turn into collagen fibers and form the organic basis of dentin.

Dentinoblasts synthesize and secrete type I collagen (the main organic component of dentin), glycoproteins, phosphoproteins, proteoglycans, and glycosaminoglycans. Specific products of odontoblasts are so-called phosphorin - phosphorylated proteins found only in dentin. They are believed to play an important role by controlling the site and rate of mineralization of dentin. Odontoblasts also produce calcium-binding proteins, osteocalcin and osteonectin, which are found in both dentin and bone. Odontoblasts have not only secretory but also lytic activity. About 15% of collagen synthesized by them is broken down by odontoblasts themselves with the help of lysosomal apparatuses.

Deposition of the first collagen fibers occurs directly in the amorphous intercellular substance of the dental papilla. When the layer of preentin reaches a thickness of 40-80 μm, it is pushed to the periphery by newly formed layers of preentin, in which the fibers have a different direction - they are arranged parallel to the

surface of the dental papilla. Later, these inner dentin layers rich in tangential fibers form the prepulpral dentin in the formed tooth, and the radial fibers lying in the outer layers of the dentin formed first - the capillary dentin.

As the dentin layer thickens, the odontoblasts gradually recede inside the papilla, leaving thin outgrowths in the dentin - the dentin outgrowths of odontoblasts surrounded by a thin cytoplasmic membrane. The dentinoblasts themselves are not included in the substance formed by them, but remain in the outer parts of the dental papilla, and in the formed tooth - in the outer layers of the pulp.

This is a characteristic feature of the development and structure of dentin, which during its existence is a cell-free tissue. Dentinoblasts also play an important role in the calcification of dentin. Through their outgrowths, they facilitate the delivery of mineral salts from the blood to the basic substance of dentin, which develops.

Electron microscopic studies have shown that there are small vesicles around the odontoblasts in the intercellular substance, which separate from the plasma membrane of these cells. The vesicles contain calcium-binding lipids and alkaline phosphatase. It is believed that they create a microenvironment in which the first needle-shaped crystals of hydroxyapatite can arise. This is how mineralization of intercellular matter begins. The first hydroxyapatite crystals that appeared in the vesicles tear their membrane, grow and are deposited on the collagen fibers in the area of enamel-dentinous communication.

Limeing of the dentin of temporary teeth begins at the end of the 5th month of embryogenesis. This process lags behind the formation of the underlying dentin, and therefore there is always a layer of unlime dentin (dentin-prementin) between the odontoblasts and the dentin layer, which is retained in the formed tooth.

The first deposits of salts of lime are observed in the dentin that covers the tip of the dental papilla, i.e. in the area of the future incisal edge of the tooth or its masticatory cusps. Later on, the islands of calcification enlarge and merge with each other. This process begins on the apex of the dental papilla and extends to the lateral surfaces of the crown, the neck and the root of the tooth.

The mineralization of dentin occurs in such a way that discrete areas of spherical calcification (dentin globules) are formed, which do not merge completely. Between these balls, areas of little or no calcified dentin may remain, which are called interglobular dentin. Conversely, a collar of highly mineralized dentin is formed around the outgrowths of odontoblasts, which is called peritubular.

The period of activity of dentinoblasts, which carry out the deposition and mineralization of dentin, is about 350 days in temporary teeth and about 700 days in permanent ones.

Enamel formation. Soon after the dentinoblasts and dentin deposition on the apex of the dental papilla, enameloblasts start functioning, which differentiate from the internal cells of the epithelial dental organ. Enamel formation - amelogenesis - begins.

The formation of dentin precedes the beginning of amelogenesis, but these processes are closely related and impossible without each other. They are a manifestation of the so-called reciprocal (reciprocal) inducing influence. The proliferation and separation of the inner enamel cells give rise to the differentiation

of the odontoblast layer at the apex of the papilla, and the deposition of a thin layer of dentin is in turn a prerequisite for the initiation of enamel formation. There are two phases of enamel development: the formation of the organic basis of the enamel prisms (so-called enamel matrix), their primary liming, and the maturation of enamel, which consists of the final liming of the enamel prisms.

The process of enamel formation is preceded by a change in the morphological and physiological polarity of the ameloblast. It consists in moving the nucleus outside and the cell organelles, on the contrary, inside, towards dentin. The change in the physiological polarity of the ameloblast, when the nucleus and organelles are reversed, is explained by the fact that there are now a sufficient number of vessels (blood capillaries) growing into the dental sack, and nutrients are supplied to the ameloblasts not from the dental papilla, but from outside - from the dental sack. In addition, the nutritional (trophic) conditions of the ameloblast on the papilla side are worsened due to deposits of dentin on its apex.

In the first phase of enamel development, the ameloblast forms the enamel prism due to complex transformations and is the main structural element of enamel. This process begins with the formation of a short cytoplasmic outgrowth in the apical part of the ameloblast, facing the dentin.

The synthesis of enamel proteins, amelogenin and enamelin, takes place in the elements of the granular endoplasmic network. In the Golgi complex, enamel proteins mature and form secretory granules entering the cytoplasmic outgrowth. When these outgrowths reach 20 μm in length, liming and formation of enamel prisms begins. The surface of the adjacent dentin becomes irregular, thus ensuring a tight connection between the enamel and dentin.

Dentin crystals are thought to initiate the formation of the first centers of crystallization in enamel. As the enamel prisms lengthen, the ameloblasts diminish and are reduced to prisms almost completely before the tooth begins to erupt. As enamel is formed and the tooth crown is formed, the epithelial dental organ decreases, its cells are reduced and disappear.

Enamel growth and development occurs from the enamel-dentine junction to the periphery of the tooth crown. The enamel surface of a tooth that has just erupted is covered by a thin, structureless shell (enamel cuticle), which is closely connected to the membrane of the enamel prisms and is a remnant of the outer enamel epithelium. After the tooth erupts, it is quickly erased, remaining on the contact surfaces of the teeth.

The second phase of enamel development - maturation - lasts about Z months. It consists of a decrease in water and organic matter, accumulation and crystallization of mineral salts.

Immature enamel, which is formed by secretory enameloblasts and has undergone primary mineralization, consists of 65% water, organic matter - 20%, mineral - only 15%. Crystals of hydroxyapatite have the size of 29XZ nm, and their density of arrangement -1240 per 1 μm2. Such enamel has the consistency of cartilage and does not

is able to perform its function. Enamel maturation is accompanied by an increase in mineral content (up to 96%), the size of hydroxyapatite crystals respectively

their density decreases to 560 per 1 μm2, the process of enamel maturation continues after the eruption of the tooth.
Mature enamel is 95-96% mineral salts and 1-2% organic substances. Almost all of it is made up of dense hydroxyapatite crystals. Due to the maturation process, a high level of mineralization of enamel is observed in its surface layer, and in the direction of the enamel-dentate, it decreases.
A feature of enamel that significantly distinguishes it from dentin, cementum and bone is that mineralization occurs extremely quickly after secretion - the time period separating these processes is only minutes. Therefore, when enamel is deposited, it has practically no non-mineralizing precursor (prodemal).
An important role in the mineralization of enamel is played by proteins that are produced by enameloblasts. They perform a number of functions, viz:
1) participate in the binding of calcium ions and regulate their transport by secretory enameloblasts;
2) create primary sites of nucleation (initiation) during formation of hydroxyapatite crystals;
3) contribute to orientation of hydroxyapatite crystals, which grow;
4) form the environment, providing formation of large crystals of hydroxyapatite and their dense conclusion in enamel. Enamel proteins are not collagenous, which also distinguishes enamel from other human body tissues. The main enamel proteins during secretion are amelogenin, which make up 90% of the proteins that enameloblasts secrete. The second group of enamel proteins are enamelins, which bind to hydroxyapatite crystals.

As enamel matures, the greatest concentration of proteins in enamel is stored in the peripheral layer of enamel prisms, traditionally called their envelope.
Liming of the enamel of temporary teeth begins in the 4th to 5th month of embryonic development. At 18-19 weeks (4.5 months) of gestation the incisal edge and 1/3 of the crown of the incisors, the incisal edge of the canines and the medial-cheeked cusp of the first temporary large molars are calcified.
In 20-25 weeks (6 months) of pregnancy the incisors are still being mineralized, the incisal edge of canines is almost completely calcified, the cheek tubercles of the first provisional large canine teeth are being accelerated, the lingual-medial tubercles are calcified, the cheek-medial tubercles of the second provisional large molars are beginning to be calcified.
At 26 weeks (7 months) of pregnancy, the mineralization of the temporary incisors and canines continues; the cheek cusps of the first temporary large molars almost merge; and the first signs of mineralization of the distal-cheek cusps of the second temporary large molars appear.
At 32 weeks (8 months) of gestation, the mineralization of the temporary incisors and canines continues. The cheek cusps of the first temporary large molars are fused. The apex of the medial-lingual cusps of the second provisional molars is formed.
At 36 weeks (9 months) of pregnancy, calcification covers all surfaces of the temporary incisors (except the cervical area), the cheek cusps of the first provisional large molars are completely fused, their lingual cusps are clearly

visible, the process of mineralization extends to the proximal surfaces of the first provisional molars. Mineralization of the distal-lingual cusps of the second provisional large molars occurs more intensively.

By the time of birth, the child has almost completely formed the crowns of the central provisional incisors, to a lesser extent the lateral incisors, half of the crowns of provisional canines, the chewing surfaces of provisional molars and the medial-caudal cusps

first permanent molars. Cervical area of incisors, vestibular, cervical and proximal surfaces of canines, lingual surface of the first temporary molars, as well as the sulcus of all temporary teeth are not fully mineralized.

Final maturation of enamel occurs after the tooth eruption, especially intensively during the 1st year after eruption. The main source of inorganic substances in the enamel is saliva, but some can also come from the dentin. With this in mind, the mineral composition of saliva and, in particular, the presence of the necessary amount of calcium, phosphorus, and fluoride ions is of particular importance for full mineralization during this period of time. Throughout life, the enamel is involved in the exchange of ions, undergoing processes of demineralization (removal of minerals) and remineralization (reintroduction of minerals), balanced under physiological conditions.

During their development, teeth respond to all the changes that occur in the child's body. Anything that interferes with and delays a child's growth also delays the growth, development and eruption of teeth.

The processes of complete formation and primary mineralization of the dental hard tissue during the period of intra-mandibular development are affected by acute and chronic diseases of the mother (rheumatism, hypertension, nephropathy, endocrine pathology, heart defects, mental illness, viral illness, toxicosis of pregnancy, etc.). High-risk factors for the development of hard tissue malformations and caries of temporary teeth are smoking and the mother's abuse of alcoholic beverages.

The saturation of the enamel with the mineral components is broken in premature children in conditions of pathological birth, and in children who have had various diseases during the neonatal period and at infant age (rickets, hypovitaminosis, diseases of the stomach and intestines, tuberculosis intoxication, chronic malnutrition, etc.).

Development of the tooth pulp. The pulp develops from the mesenchyme of the dental papilla This process begins at its apex, where dentin has already formed. At the same time, differentiation of mesenchymal cells in the central part of the dental papilla occurs. Most of the mesenchyma cells turn into fibroblasts, and they begin to secrete components of intercellular substance. It accumulates collagen first in the form of isolated fibrils, which later form fibers. As the pulp matures, the amount of glycosaminoglycans in it decreases.

With the development of the dental rudiment, the process of differentiation of mesenchyme of the dental papilla and its transformation into loose connective tissue spreads from its apex to the base, and once this connective tissue is sprouted with blood vessels and nerves.

Teething

Teething is the process of moving a tooth vertically from the place where it is set and develops in the middle of the jaw to the appearance of the crown in the oral cavity (Fig. 2). The eruption of temporary teeth begins in the 5th month of life and ends by 2,5-3 years of age (Table 1, 2). Temporary bite is divided into three periods: 1 - period of formation (from 6 months to 2-3 years), 2 - period of stable temporary bite (from 2.5 to 4 years), 3 - period of aging, or signs of erasure, late temporary bite (from 4 to 6 years). The growth and development of the child leads to changes in the maxillary system, and new functions or modifications of existing ones arise.

Signs of physiological tooth eruption are timeliness, consistency in certain groups of teeth and evenness.

The teeth on the lower jaw erupt first, except for the lateral incisors and the first temporary molars, which erupt first on the upper jaw. Even though the eruption of canines is preceded by the eruption of the first provisional molars, canines in the provisional bite occupy the correct position in the

The first physiological elevation of the bite begins with the eruption of the first temporary molars.

The first physiological elevation of the bite begins with the eruption of the first temporary molars. They play the same role in a temporary bite as the permanent ones do in a variable bite - they maintain the bite at a certain height.

Evenness of eruption means that the same teeth on each half of the jaw erupt at the same time. The lack of parity of eruption of the same teeth on different sides of the jaws is a sign of delayed growth and in some conditions can lead to anomalies in the development of dental arches and jaws.

By 10-12 months of life, all 8 incisors have erupted. After a short break (2-3 months), the first temporary molars appear, followed by canines (lower and upper), and the last large molars erupt. Given the timing of teething can vary from 4 months to 2 years (early teething), or from 8-10 months to 3-3,5 years (delayed eruption).

With the eruption of teeth and the development of chewing function the alveolar processes of the jaws grow actively, the basal part of the lower jaw thickens; the branches of the lower jaw grow; and the relief and architecture of the jaws become more complex. After the complete eruption of the temporary teeth, the dental arches of the temporary bite are formed.

Until the age of 2.5 years, the period of temporary bite - the period of formation - also ends.

Period II of the temporary bite is called the "stable temporary bite". It lasts until the age of 4 years and has the following characteristics

1. The temporary bite has 20 teeth.
2. a group of premolars and a third molar are missing.
3. Teeth are located in the dental arch without inclination - vertically.
4. The crowns of the teeth are almost the same height.
5. In the temporary teeth, the width is more pronounced than the height.
6. In the temporary teeth, the equator is poorly expressed.

7. In the cervical area of temporary molars enamel roller is defined, which presents the tooth in the form of a truncated cone.
8. Dental arches form a semicircle with a larger radius on the upper jaw.
9. The cutting edges and chewing surfaces of the teeth lie in one plane, so the occlusal plane is horizontal.
10. Roots of deciduous teeth are short and wide, formed within 2-2.5 years after eruption of the tooth during the next 2 years there is a stable condition of the root, after which physiological resorption begins.

At eruption the crown of the tooth is covered with the remains of ameloblasts and other cells of the enamel organ, which form several layers of cubic epithelium. The bone tissue above the crown is absorbed. The remnants of the enamel organ epithelium fuse with the oral epithelium, forming a dense epithelial nodule. Its central cells degenerate, resulting in the formation of a sprouting channel through which the crown passes. Thus, during eruption the tooth practically does not contact with the connective tissue of its own mucous membrane plate, does not destroy its structural elements, in particular blood vessels. That is why this process is accompanied by bleeding.

In the process of eruption, due to the remnants of the epithelium of the enamel organ and the epithelium of the oral cavity, the cuticle that covers the enamel is formed, and also provides communication between the enamel and the gums. The tightness of the periodontal junction determines the normal condition of both the gums and the periodontium. If pathogenic bacteria penetrate this barrier, gingivitis periodontitis can occur.

A considerable number of theories regarding the mechanism of teething have been proposed. The most common ones are:

The root growth theory (Hunter, 1870);

the theory of increased hydrostatic pressure in the periapical zone and pulp of the tooth (Jasvoin, 1929,1936);

the theory of bone remodeling (Katz, 1940);

the theory of periodontal traction.

The root growth theory explains tooth eruption by the fact that the root, which grows, rests against the immovable bottom of the bone alveolus and as if pushing the tooth out of it. However, this theory has a number of shortcomings. It cannot explain the complex movements of the rudiments of some teeth in the jaw before they begin to erupt, as well as the eruption of teeth with an emerging root.

The hydrostatic pressure theory. According to this theory, it is not root growth that contributes to tooth eruption, but rather, the root develops due to tooth eruption. The cause of eruption lies in the tissue of the dental papilla itself, which differentiates. During this process, fibroblasts produce a large amount of basic substance, the volume of tissue at the apex of the papilla increases, and pressure is created inside the dental rudiment, causing the tooth to move toward the free edge of the gums.

Bone remodeling theory. According to this theory, teething is caused by a combination of bone deposition and resorption processes in the alveolar wall. The

newly formed bone tissue at the bottom of the dental alveolus is thought to be able to push the tooth toward the oral cavity. However, most researchers believe that the formation and resorption of bone around the root of the tooth is a consequence, not a cause, of the tooth eruption.

The theory of periodontal traction has recently become widespread. According to this theory, the main mechanism for tooth eruption is the formation of the periodontium. The fibroblasts that make up the periodontium are arranged in chains, combining with each other through desmosomes. The cells are characterized by a developed cytoskeleton with a pronounced network of active filaments. The latter bind to certain sections of the cytolemma, which are also joined by fibronectin (adhesive glycoproteud of the extracellular matrix) and collagen fibers. This structure indicates that fibroblasts can contract, and the force that develops in doing so is transmitted to the attachment sites of the collagen fibers. As a consequence, the tooth moves relative to the walls of the dental cell (alveolus). This eruption mechanism is confirmed by experiments in which the synthesis of collagen fibers was intentionally disturbed. For example, in animals with hypovitaminosis C, teething was slowed and sometimes stopped. However, the described mechanism is hardly the only one. We should agree with those authors who believe that teething - a complex process that combines the action of several mechanisms.

The eruption of temporary teeth is one of the physiological indicators of the child's overall health, development and growth. Quality of nutrition, hygiene and sanitary conditions, pathological conditions of the child (rickets, hypovitaminosis, dyspepsia, intoxication, etc.) Significantly affect the process of teething. For example, irregular teething with violations of the gaps between the appearance of certain groups of teeth can be a sign of rickets in a child.

Root and periodontal formation

The formation of the tooth root begins before the tooth erupts, i.e. in the post-embryonic period. It begins before the tooth erupts and continues for some time afterwards. At present, the crowns of temporary teeth are mostly formed. In the area of the edges of the enamel organ, the cells of the inner and outer enamel epithelium are preserved, proliferate intensively and turn into the so-called epithelial root sheath of Gertwig, which plays an important role in the formation of the tooth root (The cells of the epithelial sheath grow deeply into the adjacent mesenchyme, separating the area from which the tooth root is later formed. Thus, the enamel organ, which is mainly responsible for the formation of enamel, also plays an important role in determining the external shape of the crown and roots of the future tooth.

The mesenchymal cells of the dental papilla, which adjoin the Hertwig's sheath from the inside, turn into dentinoblasts, which are involved in the formation of the root's dentin. After dentin is formed, the epithelial cell layer of the Gertwig's vagina loses its continuity and breaks up into separate epithelial islets connected by septa. Most of the islets resorb and disappear, some remain, and they form so-called Malasse islets (epithelial pearls) - epithelial residues on the root surface in the periodontium. They can be the source of the development of cysts.

Complex root development occurs in multi-rooted teeth. First a single wide root canal is formed, which divides into two or three sleeves during development, depending on the type of tooth.
The root dentin differs from the crown dentin in its chemical composition, it is less mineralized, the collagen fibrils do not have a clear orientation, the rate of its formation is somewhat lower.
During the formation of the root, the edge of the epithelial root sheath growing can meet on its way a blood vessel or nerve In this case, it grows around the edges of these structures and in this area of the root with a dentin defect - additional (lateral) root canal, which combines the pulp with the periudent. These canals can become pathways for the spread of infection.
Cement development. After the collapse of the Gertwig's sheath, the mesenchymal cells of the dental sac collide with the dentin of the root. In doing so, they turn into cementoblasts (cells similar to osteoblasts), which begin to deposit cement on the surface of the tooth root. Cement formation occurs in the post-embryonic period just before the tooth erupts, similar to periosteal osteogenesis. The structure of the cement is similar to that of coarse-fiber bone. Cementoblasts in their structure do not differ from osteoblasts. They form collagen fibers and the basic substance, mineralized with the formation of hydroxyapatite crystals. With the development of intercellular substance, cementoblasts turn into cementocytes.
First, a cement that does not contain cells (cell-free, or primary cement) is formed and slowly deposits as the tooth erupts, covering 2/3 of the surface of the root closest to the crown.
After the tooth erupts, a cement containing cells (cellular, or secondary) is formed. Cellular cement is located in the apical third of the root. It forms faster than cell-free cement, but is inferior to it in terms of mineralization. The formation of secondary cement is a continuous process, as a result of which its layer thickens with age.
Development of the periodontium and bone alveoli. The periodontium is formed from the mesenchyme of the dental sac in parallel with the formation of the root. After the formation of the cement from the mesenchyme cells of the inner layer of the dental sac, the remaining cells of its outer layer differentiate into fibroblasts and give rise to the formation of dense periodontal connective tissue. The bundles of periodontal collagen fibers are embedded into the main substance of the cement with one end, with the other end going to the main substance of the alveolar bone. This allows the root to attach tightly to the wall of the alveolar bone.
The thickness of the periodontal fiber bundles grows only after the tooth erupts and begins to function. Over the course of a lifetime, there is a constant restructuring of the periodontium according to the loading conditions change.
The formation of the root and periodontium in temporary teeth lasts from 1.5-2 years (incisors) to 2-2.5 years (canines, large molars) after eruption.
The next stage in the development of temporary teeth is the stabilization period.
The stabilization period is the period of development of a functionally complete temporary bite. It is characterized by the fact that all tissues of the tooth and its roots are fully formed and in a stable condition. This period lasts on average 2.5-3

years. At the same time, the processes of growth and formation of the child's masticatory apparatus are considerably affected by functional stimuli, therefore during this period it is advisable to give chewing loads in order to ensure full development of the masticatory and mimic muscles, jaw and periodontal tissues.
From the age of 5-6 years, the temporary bite is replaced by a permanent one. This is preceded by the growth of the rudiments of permanent teeth and the physiological resorption of the roots of temporary teeth.

Due to the vertical advancement of the permanent tooth in the jaw, it begins to press on the bone plate that separates it from the cell of the temporary tooth. In the connective tissue located at this point, osteoclasts differentiate and actively resorb bone tissue.
In the process of further growth, the permanent tooth presses on the root of the temporary tooth. In the connective tissue around the root, osteoclasts (more specifically, odontoclasts) also differentiate and begin to resorb the root of the temporary tooth. These giant
multinucleated cells arise most likely as a result of the fusion of mononuclear cells of the macrophage lineage. They are located on the surface of the tooth root, in the lacunae, are of considerable size, the cytoplasm contains numerous mitochondria and lysosomes. The initial stage of destruction of the tooth root tissues (cementum and dentin) odontoclastam consists of their demineralization, followed by extracellular destruction and intracellular digestion of the products of the decay of their organic matrix. During dentin resorption, the process of its destruction is accelerated due to the fact that the odontoblast processes penetrate deeply into the dentinal tubules.
Anatomical features of deciduous teeth.
The following features are important in the clinic.
- There are 20 teeth in the deciduous bite; premolars are absent.
- Teeth of the first eruption have a white color, resembling removed milk.
- The shape of the crowns of deciduous teeth is broadly similar to that of permanent teeth, but they are much smaller, the layer of hard tissue is thinner, and the dental cavity is more extensive.
- Root canals and apical openings are wide during the period of formation and resorption.
- The boundary of the transition of the crown to the root is pronounced sharply.
- A more reliable sign of differentiation is considered protruding enamel thickening (enamel roller) in the neck area and less hardness of milk teeth. In addition to general signs, there are individual features.
Incisors.
In the milk teeth, the incisors are more convex than in the permanent teeth. There are no furrows on the palatal surface. Signs of the angle are clearly pronounced. The distal angle of the maxillary lateral incisor is more rounded than that of the central incisor. The enamel ridge on the lateral incisor at the neck is less pronounced than that of the central incisor. The roots of the maxillary central incisors are enlarged, and their tips are often curved to the lip side. The crowns of

the central incisors of the lower jaw are smaller. Their roots are flat, with grooves on the medial and lateral sides.
Fangs. Crown of milk canine of upper jaw, as a rule, is shorter than permanent and has convex surfaces. There is a sharp denticle on the incisal edge and pronounced tubercles on the palatal surface. The crown of the canine of the lower jaw is narrower than that of the upper jaw. The tooth is retained for a longer period of time. The root of the canine is rounded with a slightly curved apex.
The crown of the first molar of the upper jaw is elongated in the medial-distal direction, on the chewing surface there are two cusps with a pronounced cheek-medial cusp. The palatal surface of the crown is more convex. On the cheek surface of the tooth there are two grooves, creating the impression of a ribbed surface. The first premolar of the upper jaw has three widely divergent roots. Their apexes are as if cut off, the apical openings are wide. The crown of the first milk molar of the lower jaw is elongated in the anteroposterior direction. Four cusps
on the masticatory surface are better pronounced than in other teeth. The enamel ridge in the area of the neck is well developed. The cheek surface is divided into two parts: medial - wide and distal - narrow. The first mandibular molar has two strongly divergent roots. The medial root is longer and wider than the distal one.
Second molars. The second milk molars of the upper jaw are characterized by the oblique shape of the crown and a pronounced enamel fold, located between the anterolingual and posterior cusps, as well as the fusion of the posterior cheek root with the palatine root and the absence of a root sign. In the first milk molar of the upper jaw, this sign is well expressed. The second mandibular molars of the lower jaw are similar in shape and structure to the first permanent molars of the same jaw. On the chewing surface of the crown there are 5 cusps: 3 of them are located on the cheek margin, and 2 - on the lingual one. The most pronounced cusp is anteromedial. The roots of these teeth do not differ in shape from the permanent teeth, only more divergent to the sides.
The resorption of the roots of deciduous teeth. After the age of 5, the change from a milk bite to a permanent bite begins. This is preceded by the growth of permanent teeth and the physical resorption of the roots of the milk teeth, which look shorter and scarred. The resorption of the roots of deciduous teeth begins with the root that is closest to the permanent tooth rudiment. The rudiments of the anterior permanent teeth are located at the lingual surface of the root of the baby teeth, with the canine rudiment being much further away from the alveolar margin of the jaw than the incisors. Primolar buds are located between the roots of milk molars: on the lower jaw, closer to the posterior root, and on the upper jaw, closer to the posterior cheek root, so in single-cone milk teeth, resorption starts from the lingual surface of the root, and then covers the root from all sides. In deciduous molars, resorption begins on the inner surface of the roots, i.e., on the surface facing the inter-root septum, where the rudiment of the permanent tooth is located. During root resorption the pulp of deciduous teeth is replaced by granulation tissue, which takes part in the resorption process. If the pulp is significantly replaced by granulation tissue, the resorption process is carried out additionally from the center. It ends by the time the permanent tooth erupts.

Normally the processes of eruption and resorption are completely balanced, but sometimes this physiological process is accompanied by deviations. There is an acceleration or slowing down of the resorption process. Acceleration of resorption is noted most often in deciduous teeth with a dead pulp, after chronic trauma, in the presence of a tumor, as a result of the pressure exerted by neighboring teeth. Delayed resorption is found in the absence of the rudiments of permanent teeth.

Root resorption of deciduous teeth must be considered in the treatment of pulpitis, periodontitis, tooth extraction and orthodontic interventions. Treatment of teeth with resorbed roots has its own specificity and differs from the method of treatment and filling of formed deciduous teeth.

The resorption of the roots of temporary teeth begins at the root site to which the rudiment of the permanent tooth is located closer. Therefore, it is necessary to know the location of the rudiments of permanent teeth on the roots of the corresponding temporary teeth. The rudiments of permanent frontal teeth are located at the lingual surface of the roots of the temporary teeth, and canines are much further away from the alveolar edge of the jaw than incisors. The embryos of small molars are located between the roots of the temporary large molars, on the lower jaw - closer to the posterior root, on the upper jaw - in the distal-cheek and further from the palatal root.

In single-rooted temporary teeth, the resorption site first arises on the lingual surface of the root, and then covers the root on all sides and extends in the direction from the root apex to the crown of the tooth. The lingual surface is more resorbed than the maxillary surface, so the X-ray shows an oblique line in this area.

In large temporary molars, the resorption process begins on the inner surface of the roots, that is, the one facing the inter-root gap, where the rudiment of a permanent tooth is located. Sometimes the resorption of the root surface facing the rudiment is so pronounced that the resorption reaches the root canal. The root of the tooth is thinning, but has a normal length. The distal surface of the root is resorbed later.

If the rudiment of a permanent tooth is missing, resorption of the root of the corresponding temporary tooth does not always occur, or not to its full length and with less intensity. Such temporary teeth can remain in the jaw for a long time.

The pulp of the temporary tooth during its resorption is actively involved in the processes of destruction of the tooth. Osteoclastopodibni cells are differentiated in it, carrying out resorption of the dentin and dentin from the pulp side of the tooth. The process begins in the root and then involves the crown pulp. Temporary large molars with an affected pulp are replaced before those with a healthy pulp.

Root resorption processes of the temporary tooth lead to loss of its connection with the alveolar wall and pushing its crown into the oral cavity. Removal of the crown most often occurs under the action of chewing forces. In this case there may be a slight bleeding from the damaged small vessels. The granulation tissue that forms at the location of the crown quickly epithelializes.

The loss of baby teeth is usually symmetrical on the right and left halves of the jaw, with girls faster than boys. On the lower jaw, all teeth except the second

temporary molars fall out faster. The process of tooth loss is genetically predetermined.

The resorption of the roots of the temporary teeth is uneven and is determined by their relationship with the bud of the permanent teeth. According to Vinogradova T.F., 1985, in the absence of dentoalveolar anomalies in children there are three types of resorption of the roots of temporary teeth (physiological resorption).

Resorption of single-rooted teeth is more often carried out by the first type, multirooted teeth - by the second and third types. In the later stages, the physiological resorption involves the dental pulp, which resorbs dentin from the side of the tooth cavity. The source of osteoclasts in this case is the pulp cells. In addition to the physiological resorption, under the influence of various factors (chronic inflammation, idiopathic resorption, neoplasms), a pathological resorption of the roots can occur.

Development of permanent teeth

In the process of development and formation of permanent teeth, there are four periods: 1st - intra-mandibular development, 2nd - eruption, 3rd - formation and growth of roots and periodontium, 4th - stabilization.

Period of intra-mandibular development.

The source of the formation of permanent teeth is the dental plate itself, from which the rudiments of permanent teeth develop. Beginning in the 5th month of embryogenesis, the enamel bodies of permanent teeth are formed along the lower edge of the dental plate behind each rudiment of temporary teeth. These teeth are called replacement teeth because they replace the corresponding temporary teeth. It must be remembered that children do not have premolars, so the baby molars are later replaced by permanent premolars. As during the development of the milk teeth, mesenchyme grows into the enamel organs of the permanent teeth and a dental papilla is formed. A dental sac develops around it. Earlier than other teeth, the incisors and canines are set up. In total, there are 20 rudiments of replaceable permanent teeth. At first, the rudiments of these teeth lie in the bony alveoli, shared with the rudiments of baby teeth. But later, a bony septum grows between them. Thus, separate cells for the milk tooth and the permanent tooth are formed.

At the same time, the dental plate continues to grow backward in both jaws. Along its edge, the enamel organs of the molars are formed. They have no precursors among the milk teeth, so they are also called additional enamel organs.
In the 24-25th week of pregnancy, the embryo of the first permanent large molar begins to form. Later, in the 8th month of intrauterine development, there is the beginning of the rudiments of permanent incisors and canines. Thus, 16 permanent teeth are laid down in the embryonic period.

Processes of calcification of hard tissues of permanent teeth begin mainly after the birth of the child. The 6th tooth, or the first large root tooth, is the first to be calcified. In the 9th month of intrauterine development, the
medial-cheek cusp of this tooth. In the 2nd month of the child's life, all cusps of the chewing surface undergo mineralization, in the 9th month - the entire chewing surface, at 3 years - the crown of the tooth, at 4 years of age the bifurcation of the roots is limed and begins their formation, ending at age 10.

Mineralization of the permanent central incisors of the upper and lower jaws begins in the 3rd-4th month of life. By 9 months 1/3 of the crowns are mineralized, up to 2 years - half of the crowns. Up to the age of 3 years, the crowns of the incisors are 3/4 formed, and at the age of 4, there are signs of the formation of the

dental necks and then the roots. The formation of the roots is completed at the age of 9-10 years.

Limeing of the permanent lateral incisors of the lower jaw begins in the 3rd-4th month of life, and of the upper jaw in the 9th-12th month. At the age of 2 years, the size of the lateral incisors on the upper and lower jaws becomes the same and is 7 mm. At the age of 4, the mineralization of the tooth crowns ends and there are signs of the formation of the necks, and at the end of the 5th year of life the formation of the tooth roots begins, which ends at the age of 10-11 years.

Liming of the permanent canines begins in the 4th-5th month of life. At 9 months they have a mineralized crown apex. The development of canines slows down with age. At 1.5 years of age the height of the crown is 4.5 mm, at 2 years - 7 mm, at 3 years 2/3 of the crowns are formed, at 6 years, the tooth necks form, in the 8th year the formation of the roots starts, which ends at 13 -15 years.

In the first small molars the centers of mineralization appear at the age of 1,5-2 years, at the age of 4 years 1/2 of the crowns are formed, at the age of 6 years 3/4 of the crowns are formed, at the age of 7 years the roots start growing and at the age of 12-13 years this process finishes.

The embryo of the second small indigenous tooth appears at 2 years of age, at 2.5 years two centers of mineralization appear, at 5 years 1/4 of the crown is formed, at 6 years 1/2 of the crown is formed, at 7 years the entire crown is formed, at 9 years the calcification of the root of the tooth begins, and at 12-14 years the formation of the root is completed.

The rudiment of the second permanent large root tooth emerges at 2.5 years of age, the cusps are sculptured at 3 years of age and the whole masticatory surface at 4, half of the crown at 6, the whole crown at 8, the bifurcation begins to form at 9 and the root, which ends at 15-16 years of age.

The embryo of the third permanent large molar tooth is formed at 5 years of age, the calcification of its chewing surface begins at 8 years of age, and the intramandibular crown formation is completed at 12 years of age.

The timing of the mineralization of all permanent teeth may vary somewhat.

Thus, the development of permanent and temporary teeth occurs in the same way, but at different times. During the period in which the temporary teeth are in the last stages of development, there are the beginnings of permanent teeth in the jaws, which are in the earlier stages.

The development of permanent teeth is generally slower than that of temporary teeth. For example, the period of formation of temporary incisors is 2 years, and the permanent ones are close to a year.

Anatomy of permanent teeth

A person develops 32 permanent teeth: 4 incisors, 2 canines, 4 premolars, 6 molars (a total of 16 teeth) on each jaw. Many people do not have a third molar (wisdom teeth).

erupts due to the absence of rudiments, and then they have 28 teeth. The absence of wisdom teeth and sometimes lateral incisors and the second premolar is a sign of the reduction of the maxillary system, which is predetermined by the changing nature of modern human nutrition.

Upper jaw The central incisor.

The tooth has a chisel-shaped crown and one well-developed cone-shaped root. The vestibular surface of the crown is somewhat convex. On the concave lingual surface of the crown, there is a small mound, from which the lateral facets extend to the incisal edge. The incisal edge is slightly oblique in the distal direction and has a sharp medial angle. The root is straight, slightly flattened mediodistally and deviated distally from the vertical axis of the tooth. On the cross section it has an oval shape. In general, the cavity of the tooth follows the appearance of the crown and root for shape.

Lateral incisor.

The shape of the crown is also chisel-shaped. The medial corner of the crown is pointed,

sometimes resembling a knoll. The vestibular surface of the crown is convex. The lingual surface is concave and limited by the facets of the crown. The lateral rolls of the lingual surface often converge in the cervical area, forming a triangle, with a cavity in the enamel, the blind fossa, on top of which the root is considerably flattened in the mediosteal direction. Longitudinal grooves are defined on the lateral surfaces of the root. The upper third of the root is often deviated in distal-palatal direction. The tooth cavity corresponds to the reduced shape of the crown and root.

Fangs.

The canine has one massive cone-shaped straight root with a slight deviation of its apex in the distal direction. The tooth has a rounded or oval shape on the cross section. The vestibular surface of the crown is convex. On the lingual surface, there is a longitudinal roller that divides it into two facets, of which the lateral facet has a larger area. The longitudinal enamel valleys of both surfaces transition into the incisal hump.

The lateral facets of the crown form two angles with the incisal edge, the medial one being duller than the lateral one. The tooth has all three features - angle, crown curvature, and root deviation - well defined. The cavity of the tooth follows the contours of the crown and root.

First premolar.

Has a prismatic crown, cheek and tongue surfaces and convex. On the chewing surface there are two mounds - cheek and palatal, of which the first is significantly larger. Between the hilum in the mediodistal direction there is a groove (fissure).

The root is flattened, on its wide lateral surfaces there are deep longitudinal furrows, which near the neck of the tooth begin to divide the root into two: cheek and palatine. The palatine root is more developed.

The cavity of the tooth repeats the shape of the crown. Cheek pulp horn is located closer to the cheek surface. There are two root canals. palatine and cheek canals

Second premolar.

The crown has a prismatic shape. There are two humps on the chewing surface, of which the cheek one is more developed. The ridges are separated from each other

by a transverse groove (fissure), which runs through the center of the chewing surface. Cheek surface

of the crown is larger than the lingual one. The medial part of the vestibular surface of the crown is less convex compared to the distal one (inverse sign of crown curvature).
The root is more often single, conical, straight, flattened in mediosteal direction, with wide lateral surfaces, on which there are shallow longitudinal grooves. Sometimes closer to the apex there is a bifurcation of the root into two apexes.
The shape of the tooth cavity resembles the shape of a crown. The cheek horn of the pulp protrudes more than the palatine one. There can be two root canals. cheek and palatine (about 50% of cases) or one.

First molar.

The largest among the large molars of the upper jaw. The crown is rectangular in shape (Fig. 18). The rhomboidal masticatory surface has four molars: two palatal and two more developed cheek molars. The medial-cheek lumps are more developed than the distal-cheek ones. The humps are separated from each other by an H-shaped fissure. Near the medial-facial lump, a small arcuate groove separates a small additional
tuberculum anomale Corabelli, which does not reach the masticatory surface.
The shape of the tooth cavity resembles that of a crown. The cheek horns of the pulp, especially the medial-cheek horn, protrude more. The first molar has three molars The palatal root is more massive, round and straight, the other two - cheek-medial, cheek-distal - are shorter, flattened laterally and deflected distally. The medial-cheek root is more developed than the distal-cheek root. Sometimes it has two root canals (approximately 25% of cases).

Second molar.

The crown is shaped like a cube. There are four molars on the chewing surface, which are separated from each other by an X-shaped fissure. The cheek-medial ridges are more developed than the palate. The maxillary-medial lump is the largest. The number of ridges and the location of the fissures may vary.
The tooth has three roots. The palatal root is massive, straight, well-passed. Both cheek roots, medial and distal, are flattened, deviated distally. The medial roots may have multiple root canals and apex openings.
Lower jaw.

Central incisor.

This is the smallest permanent dentition tooth (Fig. 19). The chisel-shaped narrow crown is relatively tall, its vestibular surface is somewhat convex, the lingual surface, on the other hand, is concave. On the incisal margin of the crown of the tooth that has just erupted, three small teeth are clearly visible. The medial and distal corners of the crown differ little from each other. On the vestibular surface of the incisal edge of the tooth, there are small longitudinal enamel rollers.
The root is relatively short, flattened in the mediodistal direction, oval in cross-section. Almost imperceptible signs of curvature of the crown and deviation of the

root. In general, the cavity of the tooth corresponds to its external shape. The apex of the root may be tilted to the medial (medial) plane.

Lateral incisor

slightly larger than the central one. The crown is also ovoid, flattened in the incisal area. On the vestibular surface of the crown of the tooth, which has just erupted, there are small longitudinal ridges, which end at the incisal edge with well-marked three teeth. The incisal margin has a disagreement in the angles: the distal corner is blunt, somewhat rounded, projecting toward the canine, the medial corner is sharper. The tooth has one straight root, flattened laterally, with longitudinal grooves on the contact surfaces, oval in cross-section. The apex of the root is deviated distally. The cavity of the crown of the tooth is slit-shaped, the root canal is narrow.

Fang.

The tooth is similar in structure to the corresponding upper jaw tooth, but somewhat smaller. The crown partially retains the rhomboidal shape, but looks narrower, extended, its vestibular surface is convex. There is a central knoll on the incisal edge. The medial part of the incisal margin is shorter than the distal part, which makes the medial angle sharper and further away from the tooth cervix. The root is somewhat flattened laterally, and has an oval shape in cross-section. The apex of the root is deviated distally. The cavity of the tooth is spindle-shaped with the greatest thickening in the area of the neck of the tooth.

First premolar.

The crown of the first premolar on the cross section has a rounded shape The vestibular surface of the crown is longer than the lingual surface. The chewing surface has two ridges: the cheek surface is larger, significantly sloped towards the middle, and the lingual surface is less sloped. As a result of the different size of the hills, the chewing surface is slightly slanted to the lingual side.

The apex of the root is deviated in the distal direction. Cavity of tooth corresponds to its external contours. The cavity of the crown without clear boundaries passes into the root canal

Second premolar.

The crown partially resembles the shape of the canine, but it is not as rounded on the cross section. The second premolar is slightly larger than the first. The hollows of the masticatory surface are equally developed, separated from each other by an enamel ridge, flanked by small depressions (fossae).

The root, as a rule, is single, flattened, its lateral surfaces are smooth and shiny. The apex of the root is deviated distally.

First molar.

The crown is cubic in shape There are five molars on the chewing surface, three cheek molars and two more developed lingual molars. Of the cheek lobes, the most prominent is the distal one. The cheek hiluses of the masseter surface are separated by a L-shaped fissure, the longitudinal part of which reaches the enamel rollers on

the edge of the crown The transverse fissures of this surface may pass into the vestibular surface and end in small depressions (blind fossae) on it.
The distal root is shorter than the medial root, more straight, and has a single root canal. The medial root is flattened, with deep longitudinal grooves on the broad lateral surfaces, arched, and has two root canals - medial-cheek and medial-lingual.

Second molar.

The second molar is inferior in size to the first, but has a similar crown shape and number of roots. Cubic, slightly extended in the mediodistal direction, the crown has four ridges on the masticatory surface - two cheek ridges and two lingual ridges, the latter being more developed. The longitudinal fissure on the masticatory surface is located closer to the lingual margin Transverse fissure can extend to the vestibular surface of the crown and end in a blind fossa.
The tooth has two roots - medial and distal The distal root is large, straight, rounded or oval on cross section The medial root is flattened in the mediodistal direction, with small grooves on its lateral surfaces The root apex is directed distally.
Root canals - medial-cheek and medial-lingual - are bent, poorly passed often anastomosed to each other, at the apex of the root open with isolated openings.
Root canals in children and adolescents are much wider than in older people, in which the root canals gradually narrow, especially in the apical part, up to complete obturation.
In the roots of permanent teeth in addition to the main canal there are additional canals - of different length, diameter and location, which contain a delta-like branching of the pulp (apical delta).
In the root canals of temporary teeth additional branches of the root pulp are less pronounced, sometimes they are not present at all or they disappear with the beginning of root resorption. Often anastomosed to each other, at the apex of the root they open as isolated openings.
Root canals in children and adolescents are much wider than in older people, in which the root canals gradually narrow, especially in the apical part, up to complete obturation.
The replacement of temporary teeth by permanent ones begins at the age of 5-6 years, after the eruption of the first permanent large molars, which do not have temporary predecessors. This period lasts until the age of 12 and is called the period of alternate dentition. The replacement of temporary teeth occurs in the same sequence as their eruption.
The period of eruption of permanent teeth coincides with the period of loss of temporary teeth in normal development (Table 3).
After the eruption of the permanent teeth a period of formation and growth of the roots and periodontium occurs. It lasts about 3.5-5 years, depending on the tooth group.
In the process of root formation of both permanent and temporary teeth on the X-ray we distinguish 5 stages: 1st - incomplete root growth in length, 2nd - unformed root apex; 3rd - uncovered root apex, 4th - forming periodontium, 5th - formed root and periodontium.

The stage of incomplete tooth root growth at different ages has different lengths. On a radiograph, this stage is characterized by the presence of two parallel light strips that start from the crown of the tooth, gradually narrowing and ending with two cusps. This structure of the root leads to the course of the root canal, which during this period gradually expands toward the apex of the root, forms, and looks like a funnel on the radiograph. In the lower part the canal merges with the

Average timing of eruption of permanent teeth
(by Borovsky E.V. et al., 1989 and Carlson BM, 1994).
Name of tooth Timing of eruption, year Timing of completion of root formation, year
Central incisors
Lateral incisors
An area of rounded shape, with clear contours. This area is called the growth zone, and in appearanc

In the unenclosed apex stage, the walls of the root should have the same structure as in the unenclosed apex stage. However, its walls are thicker and in the area of the root apex are not completely closed. Therefore, the radiograph clearly shows the projection of the apical orifice, which is not present in the formed root. The root canal is wide, but with a smaller diameter near the apex of the root and not at the neck of the tooth. The periodontal gap also becomes visible at the apex of the root, where it is wider than in other parts of the root.

The periodontal gap will remain wider for some time after the apex of the tooth has finished its development. This stage of root formation is called the reformed periodontum stage. According to the literature, an enlarged periodontal gap appears in 111 teeth from 7 to 11 years of age, 62 | 26 from 8 to 1 iroko, in 3 | 3 teeth from 11 to 16 years of age, in 54 | 45 teeth from 13 to 17 years of age.

In the stage of the formed root and periodontium (stabilization) the periodontal gap has a uniform thickness throughout the root - from the neck of the tooth to its apex. The apex opening is not visible on the radiograph. Changes in the width of the periodontal gap in the direction of its reduction or increase in the stabilization stage indicate the presence of a pathological process in the periodontium.

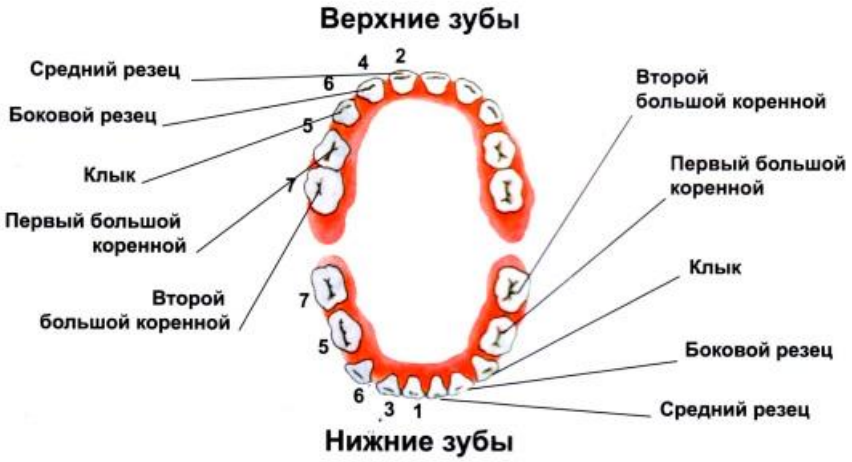
Resorption of root canals

ANATOMICAL DIFFERENCES BETWEEN TEMPORARY AND PERMANENT TEETH

1. Teeth in the temporary bite 20 in the permanent - 32.
2.In the permanent bite are incisors, canines, premolars, and molars, in the temporary bite are incisors, canines, and molars, and there are no premolars.
3.The baby teeth have a bluish-white hue, and the permanent teeth are yellowish.
4.The crown and root of a baby tooth are always smaller in size than the permanent tooth of the same name.
5.The width of the crowns of deciduous teeth is more pronounced compared to their height.
6.The shape of the crown of temporary teeth is more convex than that of the permanent tooth, which makes the crown of the milk tooth sharply disconnected from the root.
7. In the area of the neck of the milk tooth there is a thickening of enamel - enamel roller. Due to this, the crown of a milk tooth has the largest diameter in the neck area and the permanent tooth has the largest diameter in the equator area.
8.The thickness of the hard tissue of the milk tooth is less than that of the permanent tooth.
9. The hard tissues of milk teeth are less mineralized than those of permanent teeth, so they are less rigid.
10.The cavity of milk teeth is wider than the cavity of permanent teeth.
11.Root canals and apical openings of temporary teeth are wider and freer than those of permanent teeth, especially during root formation.
12.Roots of deciduous teeth are less rounded than those of permanent teeth, short and straight.
13.Spread widely apart because the rudiment of a permanent tooth is located between them.

3 Permanent teeth

Teeth Timing of eruption Timing of root formation Final "maturation of enamel" Follicle establishment
6 5 - 6 at 10 years old at 1 - 3 years old at 5 months of age
1 6 - 8 at 10 years old at 4 - 5 years old at 8 months
2 8 - 9 at 10 years old at 4 - 5 years old at 8 months a.m.
4 9 - 10 at 12 years old at 5 -6 years old at 2 months
3 10 - 11 at 13 years old at 6 -7 years old at 8 months a.m.
5 11 - 12 at 12 years old at 6 -7 years old at 3 years old
7 12 - 13 at 15 years old at 7 -8 years old at 3 years old



For infants, the number of erupted teeth is one of the objective criteria by which to assess a baby's health status. The timing of teething and the order in which they appear may vary considerably. For example,

The first tooth can appear as early as 1 month or 1 year of age, but more often it occurs in the 6th-8th month of life. To calculate the number of baby teeth (N) depending on age, use the formula: N = n-4, where n is the number of months of the child's life. At 12 months of age, your baby should have 8 teeth.

Signs of Physiological Teething

- Teething at certain average times
- Pairing of teeth
- Teething in a certain order

Causes of delayed teething:

- Rachitis and other disorders of calcium-phosphorus metabolism;
- Decreased activity of endocrine glands (hypothyroidism);
- disorders of digestion and absorption of nutrients;
- severe nutritional disorders;
- chronic infections;
- hereditary disorders of mineral metabolism and bone and cartilage diseases;

Difficult teething with fever, catarrhal symptoms, digestive disorders are most often caused by an infectious disease. Therefore, the occurrence of such symptoms during teething requires a mandatory medical examination and monitoring!

Possible features of children's teeth during the teething stage:

- Widening of gaps between teeth. This may reflect increased jaw growth and is considered normal during the transition period from baby teeth to permanent teeth. A wide gap between the front incisors on the upper jaw is usually associated with a deeply located maxillary frenulum. The orthodontist determines the tactics of observation and treatment of the wide gap between the teeth.
- A blackish rim on the neck of the tooth can be caused by the use of soluble iron preparations or a chronic inflammatory process (deposition of bacteria from the group of leptotrichia);
- A yellowish-brown staining of the teeth is more often associated with the use of antibiotics by the mother in the second half of pregnancy or by the child during the period of tooth formation.

- Yellowish-greenish staining develops with severe bilirubin metabolism disorders and hemolytic (destruction of red blood cells) conditions;
- The reddish coloring of tooth enamel is characteristic of a congenital disorder of the pigment, porphyrin metabolism. This disease is called porphyria;
- Bite anomalies occur due to uneven growth of the jaws, due to prolonged sucking of the nipple;
- Anomalies in the location of the teeth occur due to constitutional reasons (small jaw size), due to trauma, due to a congenital disorder of connective tissue exchange, with tumors of the alveolar process of the jaw.

The absence of teeth before the age of 1 year is very rarely associated with adentia - the absence of dental germs. Tooth rudiments can be checked by special radiovisiography by appointment with a pediatric dentist.

Native (permanent) teeth in children

At the age of 6-7, primary teeth begin to fall out and are gradually replaced by permanent teeth. By the age of 13, the temporary teeth are completely replaced and the child develops a permanent dentition. Normally this is a painless process due to the natural physiology of tooth replacement.

How do teeth change?

The buds of future permanent teeth are under the root of the baby teeth and are separated from it by a thin bone septum. At 6 to 7 years of age, osteoclasts of the connective tissue surrounding the deciduous tooth dissolve the mineral component of the septum and destroy it. At the same time, the pulp of the temporary unit gradually transforms into granulation connective tissue rich in osteoclasts, which gradually destroy the dentin of the milk tooth. At the same time, the roots of the temporary units are resorbed and essentially only the crown of the baby tooth remains. This can easily be removed by the dentist, or by an actively growing molar (permanent tooth).

Anatomy of permanent teeth The permanent units of a child (and adult) have a complex anatomy.

Visually, a tooth consists of three parts - crown, neck, and roots.

The crown is the visible part of the tooth that rises above the gum.

The neck is the part of the tooth at the level of the gum, at the point where the crown transitions to the root and the enamel of the unit to the cement.

The root is the invisible part of the unit located in the alveolar socket. The base of each unit consists of dentin, the hard tissue. In the crown, the dentin is covered by enamel, and in the root, by cementum. Inside the dentin is the tooth pulp, a loose, fibrous soft connective tissue infiltrated by a large number of blood, lymphatic vessels and nerve endings. Passing through the root canal, through the apical opening located on top of the root, they communicate with the main neurovascular bundle, providing nutrition of the tooth, the outflow of excess fluid and its innervation.

Normally, by the age of 13, when the permanent dentition is formed, a child has 28 permanent teeth. Between the ages of 17 and 25, the third molars (wisdom teeth) erupt and the number of units may increase to 32 teeth.

Timing and order of eruption of permanent teeth

Permanent teeth normally erupt 3 to 4 months after the loss of milk teeth. This process occurs a little earlier and faster in girls than in boys. In both sexes, the first lower molars appear first. Then the sequence of eruption of permanent teeth is about the same as that of the milk teeth and is as follows.

6 - 7 years - central incisors.

7 to 8 years - lateral incisors.

9 to 12 years - canines.

10 to 12 years - premolars.

10 to 12 years - molars.

Occurrence of the second molars, completes the formation of a permanent dentition.

The main differences between baby teeth and permanent teeth

Unlike 28 permanent teeth, a milk bite implies the presence of 20 units. At the same time they have a number of characteristic features.

Smaller, compared to permanent teeth, size.

White color with a slightly blue tint (permanent units have a slightly yellowish tint).

Less developed and slightly shorter roots compared to permanent teeth.

Enamel of temporary teeth is poorly formed - thinner.

Milk units can wear out (permanent ones can too, but this is considered pathological).

As the child grows, the baby teeth fall out on their own - this is normal. Permanent bite units should not fall out on their own.

How can you tell if a child is about to have molar teeth?

An increase in the size of the jaw is the main sign of the future change of teeth. Visually it may not be noticeable. But the appearance of teeth and diastema (gaps) between baby teeth indicates that the baby's jaw is growing and preparing for permanent dentition.

The following signs are strictly individual - they may be present or absent in a child.

Increased salivation.

Redness, swelling of the gums and oral mucosa.

Soreness of the gums.

Unpleasant itching of the gums.

Increased body temperature.

Unreasonable cough, runny nose.

Disorders of stools.

General malaise, lethargy.

Loss of appetite.

Disturbance of sleep or, on the contrary, sleepiness.

Restlessness, irritation and caprices.

Important! During the period of the eruption of permanent teeth, parents should monitor the child's condition, oral cavity and gums. When symptoms that cause concern appear, the child should immediately consult a pediatrician and pediatric dentist.

Possible problems

Although the change of teeth is a natural physiological process, some children and their parents may experience a number of problems that need to be addressed by a pediatric dentist.

No molars

The absence of permanent units can be caused by congenital adentia - the complete or partial absence of tooth buds.

Another cause of missing molars is a previous inflammatory disease - periostitis or periodontitis, resulting from advanced dental caries. Inflammatory diseases of the periosteum and the periosteal tissue have a very negative impact on the condition of the buds, and can lead to their death.

Important! It is absolutely necessary to treat baby teeth for decay. Do not assume that with the change of teeth the problem will go away by itself. The progression of the disease can adversely affect the health of the baby teeth.

Molar pain

The enamel of newly emerged permanent teeth is still poorly formed. Their low mineralization makes the teeth vulnerable to cariesogenic microflora. This can lead to the development of tooth decay and cause painful sensations.

Poorly formed enamel can make teeth more sensitive to external stimuli (cold, hot, sour, sweet), which is also accompanied by painful sensations.

Important: Permanent teeth do not normally hurt. If painfulness occurs, it is necessary to consult a pediatric dentist. A specialist will determine the cause of the pain, conduct the necessary treatment, fluoridation or re-mineralization of the tooth enamel.

Root teeth growing crooked

The irregular position of permanent teeth can be caused by two reasons - the growth of the permanent unit outpaces the loss of baby teeth, or they were extracted prematurely, resulting in the improper formation of the permanent tooth rudiments.

In this case, there is only one solution - orthodontic treatment for a malocclusion.

Important! An incorrect bite needs to be corrected. The earlier the treatment occurs, the more successful it will be. Your child will be prescribed removable or fixed orthodontic appliances, which help align the permanent teeth and bite.

Injuries

Because of their activity and lack of experience, children may accidentally injure a freshly erupted permanent tooth. They may chip or crack their permanent tooth due to mechanical damage. The damage may look unattractive. Taking care of these teeth is complicated, because food debris may get trapped in the cracks, which will inevitably lead to cavities.

Important! If a child accidentally injures a permanent tooth, you will need to seek help from a dentist. A specialist will assess the complexity and depth of damage and build up the missing tooth substance with composite materials.

Tooth loss

Healthy permanent teeth can only fall out because of severe trauma to the jaw, such as a fall or a fight between a child. A bad molar may fall out on its own. In

this case, you will also need to consult a specialist. Most likely, the child will receive temporary dentures of the lost unit, which will not disrupt the formation of the correct permanent bite.

A wobbly tooth

A wobbling permanent tooth is an alarming symptom, indicating dental pathology or the presence of inflammation. Consultation with a specialist is essential!

Hygiene of permanent baby teeth

As the molars grow and the permanent dentition is formed, special attention is paid to oral hygiene measures. They are identical to the care of baby teeth - regular brushing, flossing and rinsing.

4 Text

A comprehensive assessment of children's health is based on the following criteria:

1. The presence or absence of functional disorders and (or) chronic diseases (conditions), taking into account the clinical variant and phase of the pathological process; 2. The level of functional state of the main body systems; 3. The degree of body resistance to adverse external influences; 4. The level of achieved development and its degree of harmony.

Algorithm of preventive examinations of young children by a pediatric dentist, doctor cmamologist. The method of preventive examination of children involves a sequential interview with parents and examination of the child. The parental examination includes :

1. Genealogical history. During the questioning, the presence or absence of dental diseases in the mother, father, and other relatives is determined: caries, periodontal disease, facial and jaw development anomalies, non-carious lesions of hard dental tissues, bite anomalies, soft tissue attachment anomalies, and the presence of tumors.
2. chronic diseases of the mother. Endocrinopathy (diabetes mellitus, thyroid disease, adrenal disease); cardiovascular disease (heart defects, hypertension, hypotension); kidney disease (nephritis, pyelonephritis); gastrointestinal disease (gastritis, peptic ulcer, colitis); liver and gallbladder disease (hepatitis, cholecystitis); blood disease (anemia, hemophilia) are indicated.
3. Bad habits in parents (smoking, alcohol).
4. acute infectious diseases of the mother, suffered during pregnancy.
5. Medications the mother received during pregnancy (antibiotics, hormones, sulfonamides, barbiturates, salicylic acid).
6. Occupational hazards in the mother during pregnancy (chemical production).
7. Bad habits in the parents (smoking, alcohol).
8. Obstetric and gynecological history (pregnancy and childbirth by count, pregnancy premature or premature).
9. Pregnancy and delivery pathology: toxemia of the first half of pregnancy (vomiting, salivation, dermatosis, acute yellow liver atrophy, etc.); toxemia of the second half (dropsy, nephropathy, pre-eclampsia, eclampsia, hypertension or hypotension of pregnant women); bleeding, anemia; threat of miscarriage; complications in labor.

10. Development of the child (length and weight at birth); nature of feeding (breastfeeding, artificial, mixed; difficult, free); diseases suffered by the time of the examination (birth trauma, hemolytic disease, staphylococcal infection, newborn pneumonia, ARVI and others.

Examination of the child, description of dental status consists of:

1. External examination (the face is proportional, symmetrical, asymmetrical, has malformations in the form of cleft lip, palate, anomalies in the structure of certain parts of the face, fistulas, neoplasms, hemangiomas).

2. Palpation of regional lymph nodes (normal - not palpated).

Examination of: - respiratory function (nasal, oral, mixed); - swallowing function (somatic, infantile); - upper lip frenulum (normal, abnormal size or attachment); - lower lip frenulum (normal, abnormal size or attachment); - tongue frenulum (normal, abnormal size or attachment). - oral mucosa (color, moisture).

Examination: - tongue (pink, moist, smooth, folded, encrusted, presence of foci of desquamation). - shape of alveolar processes (semicircular, elliptical, trapezoidal). - jaw relationship: sagittally (neutral, lower jaw is in front, behind or on the same level as upper jaw); vertically (more than 3 mm gap between gingival rims, close contact between gingival rims); transversally (correct, decrease or increase in size and width of jaws).

5. Drawing up a staged epicrysis.

A staging epicrysis that specifies:

1. exact age of the child at the time of examination; 2. Number of diseases suffered by the child; 3. Facial malformations (yes, no); 4. Deviations in bite formation (yes, no); 5. Anomalies of soft tissue attachment (yes, no, elimination shown, dynamic observation); 6. Novoplasms (yes, no); 7. Recommendations. 8. Appointment of preventive measures, repeated observation by dentist, consultations with pediatrician or other specialists. 9. 9. Formation of dispensary groups:

Group I - healthy children.

Group II - healthy children with risk factors for dental diseases

Group III - children with diseases, abnormalities, deviations in formation. Examination of the child of the first month of life is carried out in the supine position on the swaddling bed.

The dentist observes the child carefully during the interview, as this is the point at which the external examination begins to reveal any irregularities in the dental and jaw system. During the interview, the doctor closely observes the child, because from this point onwards the external examination begins directly, allowing the identification of existing disorders of the formation of the dental and jaw system. Dental status of young children. Newborn baby: Mucous membrane of the oral cavity is pale pink, moist. The shape of the jaws is semicircular, gingival rims are pronounced. The tongue at rest was freely placed behind the gum rollers. The lower jaw is behind the upper jaw within 10-15 mm. The alveolar edge of the lower jaw is located behind. In the anterior region, there can be up to 3 mm of vertical gingival ridge noncombination.

Children 6 months: the mucous membrane of the oral cavity is pale pink, moist. Incisors of white color erupted, enamel is smooth, shiny, shape is not changed. There is a thickening on the alveolar processes of the upper and lower jaws in the area of future eruption of canines. The jaws have semicircular shape. The lower jaw moves forward, the gingival rims of the upper jaw are placed over the gum rims of the lower jaw (neutral position). The child swallows freely. The sucking reflex is well expressed. The tongue in a quiet state is behind the teeth, when swallowing rests against the teeth.

Children 9 months: the lips are closed, the child breathes freely through the nose during sleep and wakefulness. The mucous membrane of the oral cavity is pale pink, moist. The incisors are white in color, enamel is smooth, shiny, the shape of the teeth is not changed, the central incisors of the upper jaw contact with the incisive edges of the central incisors of the lower jaw. The jaws are semicircular in shape. The sucking reflex dies down. The chewing function is formed.

Children 12 months: lips are closed during sleep and wakefulness, nasal breathing. The mucous membrane of the oral cavity is pink, moist. The jaws have a semicircular shape. In the lateral parts of the alveolar processes, there were roll-shaped thickenings - the lateral teeth were being prepared to erupt. The lower jaw has moved forward, the teeth of the upper jaw, overlapping, in contact with the teeth of the lower jaw. At rest, the tongue is located behind the teeth, its lateral surfaces are located in the area of the alveolar processes. The tongue in the stage of the initial thrust rests against the front teeth.

Children 18 months: baby breathes through nose, lips closed during sleep and wakefulness. Swallowing is free. The mucous membrane of the oral cavity is pale pink and moist. When the jaws close, the teeth touch each other, with the upper teeth overlapping the lower ones by no more than 1/2 of the tooth crown. The tongue in a quiet state is behind the teeth, when swallowing, the tip of the tongue rests on the upper teeth.

Children 2 years: the lips are closed during waking and sleep. Breathing in a quiet state is nasal, with physical activity may be oral. The mucous membrane of the oral cavity is pale pink, moist. All 20 temporary teeth erupted. The enamel of the teeth is white, smooth, shiny, the shape is not changed. When the jaws were closed, all the teeth were in close contact with each other. The frontal upper teeth overlap the lower teeth by no more than 1/3 of the crown length.

Children 2-2.5 years: the lips are closed during sleep and wakefulness. Breathing is nasal during sleep and at rest, with physical exertion there may be mouth breathing. Swallowing is free. The tongue rests against the frontal teeth of the upper jaw when swallowing. The enamel of all 20 temporary teeth is white, smooth, shiny, the shape of teeth is not changed. The formation of the temporary bite has been completed. Characteristics of the correct bite of the period of temporary teeth: tooth arches have the shape of semicircles; - frontal teeth of the upper jaw overlap the lower teeth by no more than 1/3 of the tooth crown length, forming tight contacts; - in the lateral parts of the dental rows cusp-fissural occlusion of teeth; - frontal teeth are located with or without trims, the middle lines

of the upper and lower central incisors coincide; - if the size of the crowns of upper and lower provisional molars correspond and the dental rows are properly closed, there is a "mesial step"; if the crown width of the lower molar is 2 mm more than the upper, the distal surfaces of the provisional molars are in the same plane; if there is a greater discrepancy in the size of the crowns between the distal surfaces of the second provisional molars, "a distal step" occurs. The task of clinical examination of children is to maintain and improve the level of children's health, to prevent the possibility of formation of risk factors for diseases. For this purpose it is necessary to create optimal conditions for the physiological growth and development of the child's body. The solution of these tasks is possible only with the maximum mutual interest

5- Text

BASIC EXAMINATION METHODS

The main methods of examination of a dental patient include: - interview of the patient; - examination of the patient; - palpation (palpation) of the soft tissues of the face and oral cavity; - probing; - percussion. 1.1. Interviewing the patient The examination begins with an interview, during which the doctor finds out the patient's complaints and obtains the anamnesis data. If necessary, some questions are clarified by talking with relatives and close friends, as well as medical records related to the patient (objective anamnesis).

The findings are presented in three sections:

1) the patient's complaints; 2) life history; and 3) the anamnesis of the present disease. In the course of the interview, psychological contact between the patient and doctor is also established, which is necessary for further examination and treatment. Complaints about the state of health presented by the patient himself/herself are defined as active. In a number of cases, patients for some reason do not report very important manifestations of the disease, which should be identified specifically, using data from the objective anamnesis. The time when the first signs of the present disease, the nature of their appearance and their further course are specified. It is important to clarify the circumstances under which the disease began, and possible etiological factors. In addition to identifying the complaints indicating the signs of the disease, questioning the patient allows you to assess the course of the disease and ongoing treatment. Usually the doctor asks what bothers the patient and with leading questions directs the patient's story. During the interview, it is necessary to ask about the first manifestations of the disease, about the dynamics of its development, what bothers the patient at the moment, whether the treatment was carried out earlier and what the results of the treatment were. The patient's general well-being, the condition of other organs and systems, complaints about the change of their activity, the duration of the general disease are also clarified. Clarification of this information allows you to establish a causal relationship to the changes in the oral cavity.

Objective examination - examination of the patient

This consists of an external examination and an oral examination. The examination is conducted in good daylight or artificial light, with a set of dental instruments (dental mirror, probe angle, straight, button or notched, forceps, gauze napkins). The dentist must wear gloves, mask, goggles or face shield.

External examination

Examination of the face: - Condition of the skin on the face (color, turgor, rash, scars, etc.) and visible mucous membranes (red border of the lips, eyes, nose), - The line of lips closing, - The smile line, - symmetry of the halves of the face, - The height of the lower face, - The severity of the chin and nasolabial folds (smoothed, moderately smoothed, expressed, deepened). Each patient seeing a dentist of any profile should

be examined for tumor or pre-tumor lesions in the oral cavity. Examination of the TMJ and masticatory muscles. Palpation is the use of the fingers (usually the pads of the terminal phalanges of the thumb, index and middle fingers, and less frequently the little finger). Palpation is used to determine resistance, configuration, mobility of tissues and organs, pain response, presence of fluctuation, size and borders of the pathological focus. A distinction is made between palpation: - superficial; - deep; - extra- and intraoral. Palpation of the TMJ is performed by placing the fingers on the skin in front of the ossicle or inserting the fingers into the external auditory canal. Palpation of the joint may cause pain, you often feel tremors, clicking, crunching; synchronous movements of the head, smoothness of the amplitude of movement.

During palpation of regional lymph nodes the doctor receives information about the localization of lymph nodes, their size, shape, consistency, painfulness and relationship with surrounding tissues are determined. When palpating the lymph nodes in order to relax the muscles of the neck, the patient's head should be tilted to the side under examination. Palpable lymph nodes: submandibular, submandibular, parotid, parotid, parotid, occipital, superficial-neck.

Examination of the oral cavity

Examination of the oral cavity is carried out sequentially: - examination of the antero-mouth, - examination of the oral cavity itself. Examination of the vestibule of the mouth is carried out with the jaws closed, raising the upper lip and pulling down the lower lip. The mucous membrane of the cheeks is examined by moving the cheek with a dental mirror. When examining the vestibule of the mouth pay attention to the condition: - red border of the lips, corners of the mouth (color, formation of scales, crusts); - inner surfaces of the lips (knobby surface, small salivary glands); - inner surface of the cheeks (color, moisture, Fordyce glands); - discharge ducts of parotid salivary glands) (Fig. The gingiva (color, density, presence of pathological elements); - anterograde of the mouth, frenulum of the lips, mucous pulls; transitional fold (depth, color, presence of pathological elements).

9. Examination of the oral cavity vestibule: 1 - sebaceous glands; 2 - serous-mucous glands; 3 - outlet ducts of mucous glands; 4 - lymphoid follicles; 5 -

gingiva; 6 - interdental papilla; 7 - teeth. Fig. 10. Physiological bite Fig. 11. Exhaust duct of the parotid salivary gland 11 Examination of the oral cavity itself:

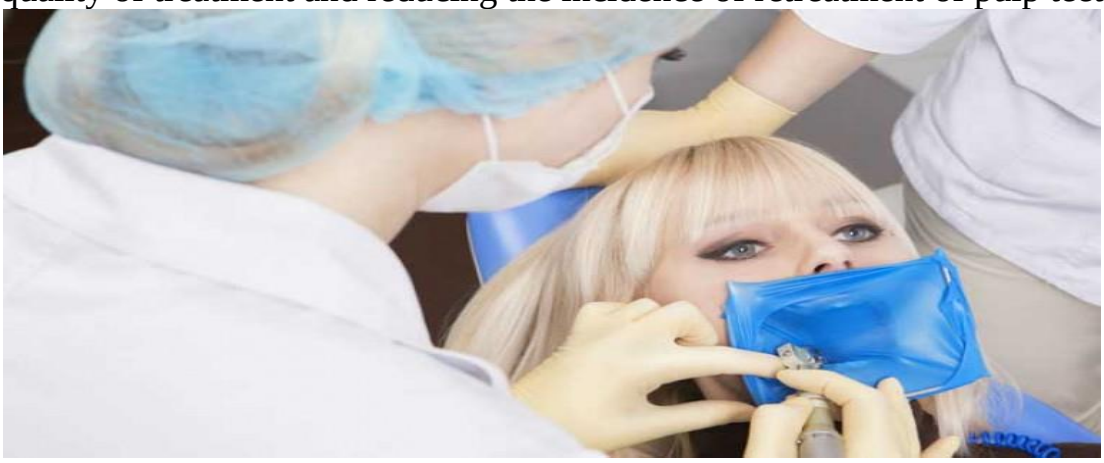
Inspection of the hard palate - condition of the mucous membrane (color, moisture), presence of pathological elements, palatal suture, severity of the incisor papilla, folds of the hard palate, mucous glands outlet ducts on the border with the soft palate (Fig. 12). Soft palate Examination of the soft palate - condition of the mucous membrane (color, moisture), palatine arches, palatine tonsils, presence of pathological elements. Soft palate 12 Examination of the tongue - the mucous membrane of the tongue consists of multi-layered squamous neo-thoracic or partially corroded (filiform papillae) epithelium and its own mucous membrane lamina. The lower surface is smooth, covered with multilayer squamous neohornoid epithelium. Due to the presence of submucosal

The mucous membrane of the tongue is mobile. At the back of the tongue, the mucous membrane is tightly fixed to the muscles. On the posterior third of the tongue there is a cluster of lymphoid tissue in the form of large or small follicles. The lymphoid tissue is pink in color, although it may have a bluish tint. This lymphoepithelial formation is called the lingual tonsil. In the posterior part of the tongue in the submucosal base there are small salivary glands, which are divided into serous, mucous and mixed according to the nature of the secretion. The intrinsic lamina of the mucous membrane of the tongue together with the epithelium covering it forms protrusions - tongue papillae. There are filiform, mushroom-shaped, leaf-shaped and grooved papillae of the tongue. Examination of the tongue begins with determining the condition of the papillae, especially if there are complaints of changes in sensitivity or burning and soreness in some areas. Thread-like papillae are the most numerous (up to 500 per 1 cm2). They are located on the entire surface of the back of the tongue, covered with multi-layered squamous keratinous epithelium, which gives them a whitish color. When the normal rejection of keratinous scales is disturbed, for example in pathology of the gastrointestinal tract or in pathological changes in the oral cavity with candidiasis, a white plaque is formed on the tongue - "encrusted" tongue. Intensive rejection of the outer layer of the epithelium of the filiform papillae in a limited area (more often on the tip and lateral surface) is possible. This phenomenon is called desquamation. This condition may not bother the patient, but there may be pain from irritants, especially chemical ones. Thread-like papillae have tactile sensitivity. Mushroom-shaped papillae are located on the sides and tip of the tongue. There are fewer of them on the back of the tongue. Mushroom papillae have a good blood supply. Due to the fact that the epithelial layer covering them is not keratinized, they look like red dots. Taste buds (bulbs) are embedded in mushroom papillae. Leaf-shaped papillae are located on the lateral surface of the tongue and in the posterior parts (in front of the grooved ones). Leaf-shaped papillae also contain taste buds (bulbs). Grooved papillae (papillae surrounded by a shaft), the largest papillae of the tongue, are arranged in one row (9-12) in a ledge (like a Roman numeral V) on the border of the root and body of the tongue. Each papilla has the shape of a cylinder 2-3 mm in diameter and is surrounded by a groove into which the discharge ducts of small salivary glands open. There are a

large number of taste buds (bulbs) in the walls of the grooved papillae. The tongue is supplied with blood by the lingual artery. The venous outflow occurs through the lingual vein. On the lateral surface at the root of the tongue a vascular (venous) plexus of larger or smaller size can be seen, which is sometimes mistaken for a pathological one. A vein pattern due to varicose veins is sometimes clearly seen in the same place, but this symptom has no clinical significance.

6 - Text

In modern dental practice, specialists use a cofferdam - a latex handkerchief to isolate a diseased tooth from the oral cavity. The technology replaces standard cotton rolls. There is no need to use "saliva ejector", the replacement of saliva soaked rollers and the use of gentle antiseptics for rinsing the prepared cavity (in order to avoid damage to the patient's oral mucosa in the case of aggressive, but more effective chemicals). Isolation of the working area from the oral cavity eliminates the penetration of harmful bacteria and infections, thus improving the quality of treatment and reducing the incidence of retreatment of pulp teeth.



Most often this term refers to a piece of latex with a hole in it. In fact, it is a broader concept, because in addition to standard 15x15 cm flaps, there are also cofferdam roll forms, three-dimensional latex plates, as well as its liquid version. The invention is not new at all. The first dental treatment using this technology was performed back in the middle of the 19th century. Who owns the original idea - a question of dispute, as for the authorship claimed both the Frenchman La Roche, and the American Sanford Christy Burnim.

Despite the long history of cofferdam, its use in ordinary Russian dental offices is extremely rare. And where it is used, most patients react skeptically to the suggestion of placing a latex dental dam in the mouth. After treatment with a cofferdam, however, it is hard not to appreciate all of its benefits.

The use of a cofferdam has the following goals:

1. to keep the working surface sterile and dry, i.e. no saliva or blood should enter the teeth and root canals;
2. preventing the patient from swallowing medications, dental instruments, restorative material, possible pathogenic bacteria breeding in the pulp thickness;

3. protection of the field of dental manipulation from contact with the tongue and the inner surface of the cheeks;
4. improving the visibility of the treated tooth;
5. easier access to problematic areas;
6. preventing possible fogging of the dental mirror.

Important to understand! Cofferdam is used to increase the comfort of treatment and maximum quality of work. It does not limit
the process of swallowing saliva and nasal breathing, so it does not cause discomfort!

Advantages of cofferdam.

Cofferdam has a lot of advantages. Its use is preferable for both the medical staff and the patient.

Benefits for the doctor:

1. the field of work is as open as possible, a quality view of all surfaces of problem areas is provided, which facilitates manipulation;
2. no need for saliva control, timely replacement of the cotton rolls and use of saliva ejector;
3. additional protection for the medical personnel against possible infections of the patient;
4. the damage of natural processes (coughing, sneezing, breathing directly) is minimized, which contributes to the maximum adhesion of the materials with the tooth surface;
5. the patient has no opportunity for inappropriate conversations.

Benefits to patients:

1. oral mucous membranes are protected from the effects of sharp instruments and caustic disinfecting and rinsing fluids - no physical damage, reduced risk of allergic reactions;
2. the possibility of foreign objects (splinters of teeth, particles of crowns, miniature dental instruments, fillings) and infections entering the pharynx and respiratory tract is prevented;
3. the tongue is protected but in a natural position that does not stress the chewing muscles, does not make it difficult to swallow saliva and allows you to easily tolerate prolonged treatment with the mouth open;
4. the possible gag reflex is suppressed because the cofferdam protects the palate.

The most important advantage of cofferdams is a significant improvement in the quality of work performed. Fillings last longer, the probability of repeated inflammation of the root canals due to infection during treatment - is minimal.

Disadvantages of cofferdams.

Even the most useful technology always has controversial points and limitations in its application. The disadvantages of cofferdam are few, but it is still necessary to consider them.

The disadvantages include:

1. the possibility of the patient being allergic to the latex or talc with which the finished plates are covered;
2. possible traumatization of interdental papillae;

3. the difficulties in maintaining the axial reference points in the preparation of the tooth cavity at the entrance;
4. The need for additional conditions for radiography.

Contraindications for the use of cofferdam.

1. Presence of braces or bridges that prevent the placement of the cofferdam. 2. A history of epilepsy and Alzheimer's disease, as well as neurological disorders and mental instability. 3.
3. Respiratory diseases that interfere with nasal breathing (rhinitis of any nature, maxillary sinusitis), and asthma.
4. acute inflammatory process in the gums and root caries.

In rare cases, the latex veil cannot be applied because of the anatomical structure of the jaw.

Areas of application.

According to current requirements for dental procedures, the cofferdam is recommended for the following manipulations:
1. endodontic treatment (any intrusion into the root canals must exclude the ingress of saliva or blood, otherwise there is a high risk of infection and poor quality sanitation). On the other hand, the delicate mucosa in the patient's mouth can be damaged by the strong antiseptics used during treatment. Both of these problems are perfectly counteracted by the use of a cofferdam;
2. adhesive dentistry (this has higher requirements for the bonding of restorative materials to the tooth);
3. filling or restoration of teeth with light-curing materials (cofferdam allows to work with a dry surface of the tooth and protects the gum from irradiation by the lamp);
4. bleaching of tooth enamel (cofferdam in this case plays the role of a protector of lips and mouth of the patient from the high temperature effects of bleaching lamps).

Latex wipes make the work of the dentist easier and can be used in most situations. However, cofferdam placement most often involves working in four hands, so the doctor needs an assistant. In its absence, the technique is rarely used.
Cofferdams are also unnecessary for small amounts of work and in most cases in pediatric dentistry.

7 - Text

THE INFLUENCE OF BAD HABITS IN CHILDREN ON THE DEVELOPMENT OF THE DENTOALVEOLAR SYSTEM

One of the causes of the occurrence and development of dentoalveolar anomalies and deformities of the facial skeleton are bad habits and disorders of swallowing and lip-clamping functions. In a number of children, these problems arise due to various concomitant diseases, in particular, ENT-pathology, as well as some neurological disorders.
The following types of bad habits are distinguished:
- Finger sucking;

- Sucking foreign objects;
- prolonged use of a pacifier;
- biting the lips, cheeks;
- Putting the tongue between the teeth during swallowing, speech, etc.

The untimely detection and correction of the above-mentioned disorders leads to the development of dento-alveolar anomalies already in the early preschool age, and only gets worse with the years, complicating the ways of their elimination.
Special mention should be made of such a risk factor as disorders of swallowing, nasal breathing, chewing, and speech. This is often seen in children exposed to frequent colds, unable to breathe through the nose and walk with closed lips.

Normally, when swallowing, the tongue rests against the hard palate. When it is disturbed, the tongue protrudes forward, causing a deformity of the teeth.

Bite anomaly caused by impaired swallowing function with the tongue slipping between the teeth.


Bad habit of biting the lower lip.

The patient likes to suck on the TV remote. As a consequence, there is underdevelopment of the lower dentition and an increase in the size of the upper dentition.

Impaired nasal breathing and lip-clamping result in a narrowing of the dentition and a lack of space for permanent teeth.

Weak tone of the tongue and lip muscles - mouth type of breathing is the result of adenoid hypertrophy.

Пример так называемого «аденоидного лица»: губы несомкнуты, с уголков рта стекает слюна, отмечается вялый, инфантильный тип глотания.

So how can we prevent the development of these and other similar dental anomalies? The answer is simple: a healthy person is a beautiful person. Hardening the body, exercise, proper balanced diet - the main way to prevent bad habits and dysfunctions.

No less important is the psychological microclimate in the family. A child surrounded by the attention and care of the parents is not prone to neurosis and bad habits associated with them (finger sucking, nibbling, etc.), and therefore less likely to develop jaw deformities.

Also essential for prevention is regular visits to the dentist (at least twice a year).

8 -TextRADIOLOGICAL EXAMINATION

Radiography, zono- and tomography

In the diagnosis of diseases of the maxillofacial region, a wide range of X-ray diagnostic techniques is used: intraoral radiography; extraoral and panoramic radiography of the jaws; radiography, linear and panoramic (orthopantomography) tomo- and zonography of the facial skull.

INTRAORAL RADIOGRAPHS.

To determine the condition of the roots of the teeth and surrounding bone tissue, intraoral radiography is performed on dental X-ray units (Fig. 1.1), carried out in four imaging modes: periapical (contact), parallel beams from increased skin-focus distance, interproximal and in bite.

Periapical radiography developed in 1906 by A. Cieszynski is widely used for diagnostics of periapical tissues pathology. Its principle is to direct the X-ray beam perpendicularly to the bisector of the angle formed by the long axis of the tooth and the film plane (Fig. 1.2, a). For each group of teeth there is a certain angle of inclination of the X-ray tube (Table 1.1).

Fig. 1.1. Appearance of the dental X-ray unit

Table 1.1. X-ray tube inclination angles in intraoral periapical radiography according to S.L. Kopelman and L.G. Berman

The main task of the study is to obtain a clear image of periapical tissues, that is why the beam is centered on the projection of the root tips of different groups of teeth (Fig. 1.2, b). When interpreting the image it should be taken into account that shadows of periapical destruction zones often overlap the tooth roots contours, projectionally decreasing in size. Carious cavities in the crowns of all teeth are displayed in oblique projection. Unreliable transfer of interalveolar septum height does not allow to judge about the extent of periodontal bone changes. Errors in the inclination of the X-ray tube, the alignment of the radiation beam and the position of the film in the patient's mouth can cause a significant deformation of the image.

Currently, the problem of inflammation remains one of the most pressing issues in dentistry. The number of inflammatory diseases in the maxillofacial region is increasing.

Therefore careful and complex examination of the patient is very important for successful diagnosis, which is the key to timely and effective treatment.

Examination of the patient consists of:

- collection of anamnesis;

- Clinical and instrumental examination;
- laboratory examination;
- Radial examination.

The anamnesis collection and clinical examination require great care and knowledge of the case. It is necessary to patiently listen to the patient's complaints and study the symptoms in detail. During the examination, it is necessary to pay attention not only to the patient's complaints, but also to carefully examine all oral cavity formations, necessarily considering the condition of the whole body. It is known that clinical, radiological symptoms of many pathological processes, the cause of which are both diseases of local character and complications of diseases of other internal organs or systemic processes, have the same picture. That is why a painstaking clinical and radiological examination of patients admitted to the dental clinic with suspicion of inflammatory and degenerative-dystrophic processes of the teeth and jaws is required to establish the diagnosis and determine the cause of the disease.

Inflammatory diseases are pathological conditions that arise under the influence of an infectious origin that has entered the body. In response, exudative, productive and destructive reactions develop at the site of localization of pathological changes in the bone. The presence of these three components is obligatory for all inflammatory processes, but in each disease they are expressed in a different degree.

9 - TextCLASSIFICATION

Oxidizing agents (potassium permanganate and hydrogen peroxide).
Halogen-containing preparations (iodine, iodinol, iodoform, solution of
Ligol solution, povidone iodine, chloramine B, chlorhexidine).
Acids and alkalis (boric acid, sodium tetraborate).
Heavy metal compounds (silver nitrate, collargol, silver proteinate,
zinc oxide).
Aldehydes and alcohols (formaldehyde solution, ethanol).
Detergents (miramistine, benzalkonium chloride, cerigel).
Group of phenol and its derivatives (phenol, resorcinol, thymol, polycresulene,
birch tar).
Dyes (brilliant green, methylthioninium chloride, ethacridine).
Nitrofurans (nitrofural (furacilin), nifuratel).
Preparations of plant origin (marigold flower,
sanguiritrin, chlorophyllipt, eucalymin).

rugs of animal origin (lysozyme).
MECHANISM OF ACTION AND PHARMACOLOGICAL EFFECTS
Antiseptics
- Broad spectrum antimicrobials that affect bacteria, fungi, protozoa and some viruses.

The mechanism of action
of different groups of drugs is not the same. They can affect the permeability of cytoplasmic membranes and inhibit the activity of enzymes that are important for the vital functions of
microorganisms enzymes, cause protein denaturation.
Applications:
Antiseptics are general cellular poisons; they are used only externally to disinfect skin, mucous membranes, dental tissues, and wound surfaces. When absorbed
into the blood they have a toxic effect on the cells of the macroorganism.
Oxidizing agents
(potassium permanganate and hydrogen peroxide)
MECHANISM OF ACTION:
Are capable of detaching atomic oxygen.
INDICATIONS:
Antiseptic treatment of the oral mucosa, gums, periodontal pockets,
Carious cavities and root canals;
Stopping capillary bleeding lunate, from the stump of the pulp of the tooth, surface wounds;
Bleaching of dental hard tissues after trauma, for fluorosis, discoloritis
Depulpated teeth (hydrogen peroxide).
CONTRAINDICATION:
Hypersensitivity.
SIDE EFFECTS:
Side effects are rare with proper use:
allergic reactions, mucous membrane burns (concentrated solutions).
INTERACTION:
Hydrogen peroxide is incompatible with alkalis, heavy metal salts, some
heavy metals, some oxidants.
Potassium permanganate is incompatible with alkaloids, quinine, activated carbon, sugar,
tannin, easily oxidizing agents. When it reacts with sulfur, sodium thiosulfate,
Reduced iron form explosive mixtures. When interacting with bromides,
Iodides, chlorides, free halogens are liberated.
Oxidizing agents
(potassium permanganate and hydrogen peroxide)
MECHANISM OF ACTION:
Are capable of detaching atomic oxygen.
INDICATIONS:
Antiseptic treatment of the oral mucosa, gums, periodontal pockets,
Carious cavities and root canals;
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Oxidizing agents
(potassium permanganate and hydrogen peroxide).

Potassium permanganate
in contact with tissues decomposes to form: atomic oxygen, which has antiseptic and deodorizing effect; manganese dioxide, which in low concentrations (0.05-0.1%) has astringent, anti-inflammatory, and in high (2-5%) - cauterizing effect. Potassium permanganum has superior antiseptic effect to hydrogen peroxide.

Hydrogen peroxide has the effect of:

local antiseptic,

astringent

anti-inflammatory,

cauterizing,

deodorizing,

hemostatic and bleaching.

In tissues under the influence of peroxidase it decomposes with the formation of atomic oxygen, and in the presence of protein it is destroyed by catalase with the formation of molecular oxygen. The resulting foam cleans surfaces of pus, blood, tissue detritus, but the antimicrobial activity of molecular oxygen.

HALOGEN-CONTAINING PREPARATIONS
(preparations containing or releasing chlorine or iodine)

MECHANISM OF ACTION:
Act on the basic enzyme systems of microorganisms, cause protein denaturation,

oxidize organic compounds, have bactericidal and deodorizing effect.
INDICATIONS:
Halogen-containing preparations are used for antiseptic treatment of microinjuries, in the treatment of
pyo-inflammatory processes of the mucous membranes of the mouth and gums, for processing poorly permeable root
root canals at pulpitis and periodontitis.
CONTRAINDICATIONS:
Hypersensitivity, dermatitis, tendency to allergic reactions.
Contraindications to the use of iodine preparations: hyperthyroidism, adenoma of the thyroid gland, herpetiform
Duhring's herpetiform dermatitis, renal insufficiency, pregnancy, breastfeeding, breastfeeding age.
SIDE EFFECTS:
With hypersensitivity and prolonged use of iodine preparations, iodine phenomena (swelling
tissues, runny nose, salivation and lacrimation, maxillary sinusitis, frontitis, Quincke's edema, etc.).
Chlorhexidine may cause dry and itchy skin, dermatitis, sticky hands for 3-5 minutes, staining of teeth,
dentures, tartar buildup, taste disorders (when treating gingivitis), allergic reactions,
skin photosensitization, epithelial desquamation, salivary gland enlargement.
INTERACTION:
Iodine preparations are not recommended to be combined with antiseptic and disinfectant preparations containing
mercury, enzymes, oxidants and alkalis. Iodine is pharmaceutically incompatible with essential oils and solutions of
ammonia solutions.
Simultaneous use of chlorhexidine and iodine preparations is not recommended.
Chlorhexidine is pharmaceutically incompatible with soaps, bases and other anionic detergents. Chlorhexidine increases the sensitivity of microorganisms to cephalosporins, levomycetin, aminoglycosides, is compatible with drugs containing cationic group (benzalkonium chloride).
Iodine preparations
(alcohol iodine solution, iodinol, iodoform, Lugol solution, povidone iodine)

Characteristics:

Iodine is a crystalline substance, poorly soluble in water, well
It is very soluble in alcohol and potassium iodide. Iodine is a micronutrient required for the synthesis
thyroid hormone. It increases metabolism, increases tissue permeability,
promotes the resorption of inflammatory infiltrates. In the excretory tract, iodine has
Irritating effect and reflexively increases secretion of salivary and bronchial glands.

Action at local application:

Antiseptic (antimicrobial, antifungal and antiprotozoal);

deodorizing;

anti-inflammatory;

irritant;

styptic;

cauterizing.

Iodinol and povidone-iodine have a longer action, their irritating effect is less pronounced than that of iodine alcohol solution.

10 - Questions on the topic

Text

Unlike general anesthesia, in which the patient sinks into a deep drug-induced sleep and does not react to external stimuli in any way, local anesthesia is a method of anesthesia by blocking the innervation at the site of surgical intervention. This type of anesthesia is used in dentistry for treatment, prosthetics, treatment of gum diseases.

The peculiarity of local anesthesia is that it eliminates 100% of pain sensations, but retains sensory perception. That is, the patient can feel tremors, vibrations, and pressure. In some cases, tactile sensations are perceived by patients as unpleasant. The dentist's job is to use the optimal anesthesia method that will protect the patient not only from pain but also from discomfort and stress during treatment.

The use of anesthesia in dentistry

Treatment in dentistry in most cases involves minimally invasive and invasive manipulations, which can be painful for the patient. The use of local anesthesia in dentistry solves this problem. Local anesthesia has made treatment comfortable for the patient and has simplified the doctor's work.

Local anesthesia in dentistry is used:
- in the treatment of caries and its complications (pulpitis, periodontitis), non-carious dental lesions;
- surgical treatment of periodontitis (curettage, the removal of gum recession, gingivoplasty, guided tissue regeneration);
- dental prosthetics;
- tooth extraction;
- osteoplasty, implantation;
- Tooth-preserving surgical procedures (root amputation, hemisection, resection of the root apex);
- removal of tumors, cysts, resection of tissues in the treatment of periostitis, pericoronitis, abscess opening.

Methods of local anesthesia

At the moment, there are the following types of anesthesia in dentistry:
- applicative;
- infiltration;
- conductive;
- intraligamentary;
- stem anesthesia.

Applicative local anesthesia is used for superficial anesthesia (gingiva, mucosa). Applicative anesthetics are available as a gel, spray based on benzocaine, lidocaine.

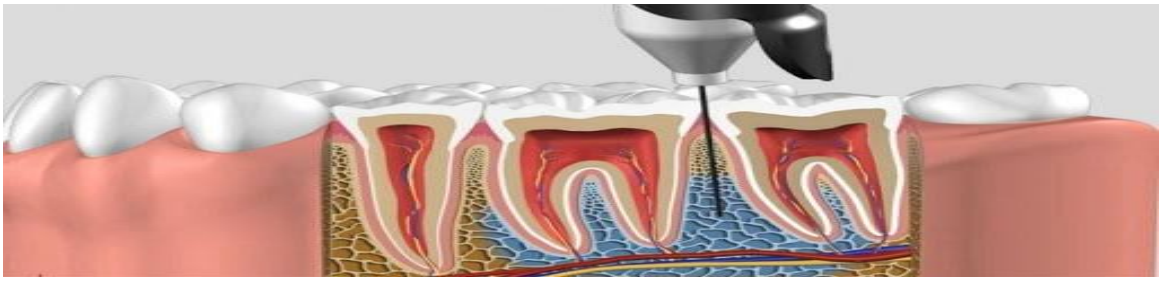
When treating caries, pulpitis, a number of operations in the mouth is used infiltration anesthesia in dentistry - several injections of anesthetic in the gum tissue, under the skin in the intervention area. It is ineffective in the treatment of chewing teeth of the lower jaw, where it is preferable to use conductive or intraligamentary anesthesia.

For complex surgical procedures on the lower jaw, guided anesthesia in dentistry is used - an injection of a drug into the area where the nerve is located, allowing a small dose of anesthetic to pain a large area.

Intraligamentary anesthesia is an injection into the circular ligament of the tooth.

The rarest method of local anesthesia is stem anesthesia, in which the drug is injected into the base of the skull, whereby all the nerve endings belonging to the trigeminal nerve are blocked. This method is used in the hospital in exceptional cases (neuralgia, high pain sensitivity in the patient, etc.).

Local anesthesia: materials and methods



In dentistry, drugs of the amide and ester series are used for local anesthesia. Let us consider the most common drugs.

Use of Ultracaine

Ultracaine is a low-toxic anesthetic based on typhene. The effectiveness of the drug is 2 times higher than lidocaine, 6 times higher than novocaine, while ultracaine is safe in 99.4% of cases, reduces blood pressure. It does not contain parabens, which can have toxic effects and cause allergic reactions. Ultracaine contains adrenaline, which promotes constriction of blood vessels, prolonging the effect of the anesthetic, as well as antioxidants that prevent its oxidation.

The half-life of the drug - 22 minutes, and after 44 minutes anesthetic is completely disintegrated, after which it is completely eliminated from the body. Ultracaine DS is the safest anesthetic in dentistry, which is suitable for anesthesia in pregnancy (it does not cross the blood-placental barrier, so it has no adverse effect on the fetus).

Advantages:

- A strong fast-acting anesthetic agent of medium-low toxicity;
- Prolonged action - 1.5-2 hours or 5-6 hours (depending on the technique of anesthesia);
- possibility of use in the treatment of children of preschool age (over 4 years) and pregnancy;
- good tolerance of the drug components (allergic reactions are extremely rare - 1 per 100 thousand cases, toxic reactions to adrenaline and sodium disulfate present in the drug - in 4.3% of cases).

Ultracaine is quite a strong anesthetic, and its variant Ultracaine DC is used in dentistry as a reserve anesthetic for complicated cases:

- Highly traumatic surgical procedures;
- anesthesia of lower molars for therapeutic, endodontic treatment;
- treatment of inflammatory processes - periostitis, osteomyelitis;
- Treatment of patients with high pain sensitivity.

Use of Scandoneast

Scandonest is an anesthetic drug that is used in the treatment of patients with a contraindication to the use of vasoconstrictor drugs. It has a vasoconstrictor effect, does not contain adrenaline and is suitable for anesthesia in patients with cardiovascular disease. The absence of adrenaline in the composition means that scandoneast contains no sulfites, which means it is safe for patients with bronchial asthma, allergic (in the latter case, it is used after an allergic test).

The anesthetic scandoneast belongs to the category of medium potency drugs, depending on the zone of intervention it blocks the pain sensitivity for 20-90 minutes.

Ubistezil application

Ubistesin is a drug based on articaine and epinephrine. It is injected into the mucous membrane, is low-toxic, gives a prolonged effect (anesthesia of the pulp for 45 minutes, gums, mucous membranes, soft tissues - for 2-4 hours). Ubistesin is used for infiltration, conduction anesthesia for small surgical interventions, preparation/treatment of teeth (caries treatment, mucosal surgery, suturing, stump preparation for crown/prosthesis, endotherapy).

Advantages:

- fast action (pain in the soft tissues is blocked as early as 1-3 minutes after injection);
- the drug disintegrates in the body, and its breakdown products are eliminated through the kidneys and liver;
- has a minimum of contraindications associated with sensitivity to anesthetic components, has a weak effect on the cardiovascular system due to the low concentration of adrenaline;
- suitable for use during pregnancy and lactation, as the drug components do not cross the blood-placenta barrier and do not penetrate into the breast milk;
- It is suitable for use practically for any type of dental treatment.

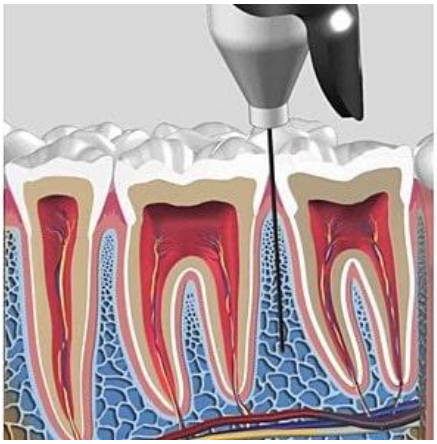
The drug ubistezine is not recommended for complex, lengthy surgeries.

Use of Septanest

Septanest is an articaine-based local anesthetic. It is indicated for simple tooth extraction (single, adjacent, multiple, retained), preparation of teeth, simple operations. When using Septanet, there is rapid anesthesia of the teeth with prolonged action due to the presence of adrenaline in the drug. Septanet is intended for administration under the mucous membrane, for infiltration and conduction anesthesia.

The rate of onset of reaction is 1-3 minutes and the time of action is 30-45 minutes. Additional doses of the drug shall be administered in the course of treatment if prolongation of the anesthetic effect is required. It is used with caution in patients with cardiovascular diseases, central nervous system diseases and allergies. It is not recommended for use during pregnancy, as septanest crosses the placental barrier.

Innovative methods of anesthesia




The most unpleasant thing about the anesthesia procedure is the anesthesia shot in dentistry, which can be quite painful. To eliminate the psychological factor (fear of needles) and any unpleasant feelings from the introduction of anesthetics allowed the local anesthesia system STA.

It is a new computerized system that consists of a microprocessor, a light and comfortable handpiece with an integrated needle. The system for anesthesia in dentistry allows for different types of local anesthesia, automatically and accurately calculates the dosage of the drug and the optimal place for injection, provides an optimal speed of the drug administration.

Advantages of computer anesthesia:
- painless injection due to a targeted, uniform delivery of the anesthetic;
- elimination of the risk of tissue trauma;
- control of dosing (reduction in the dose of the administered drug, reduction in the time of drug action after treatment);
- possibility of point anesthesia (of one tooth without numbness of half of the jaw);
- absence of unpleasant feeling of numbness of half of the face;
- the possibility of anesthesia for people in risk groups (with hypertension, in pregnancy);
- the possibility of safe, painless and psychologically comfortable anesthesia in children.

Alternative methods of anesthesia

In cases when a patient is contraindicated to local anesthesia, when the patient is highly psycho-emotional susceptible, or in the case of prolonged treatment, which can be very tiring and uncomfortable for the patient, the dentist can apply an alternative method - treatment in sedation (medicalization of sleep).

Sedation should not be confused with general anesthesia. General sedation in dentistry is very rarely used (in maxillofacial surgery) and only in inpatient care. Sedation is a sedative that helps the patient to relax. The advantages of sedation are:
- Can be used in early childhood, in the treatment of the elderly, patients with cerebral palsy, autism and other CNS disorders;
- the ability to perform a large volume of work during a single visit to the clinic (treatment of multiple caries, comfortable removal and one-stage implantation, while the patient is asleep);
- eliminating the psychological discomfort factor in the patient (fear, anxiety);
- the ability to perform quality treatment (when the patient is asleep, he does not resist, not nervous, so nothing distracts the doctor from his work).

Peculiarities of local anesthesia in children

The use of anesthesia in pediatric dentistry involves a high risk of allergic or toxic reactions. Therefore, when treating children it is necessary to do allergy tests, carefully calculate the dosage of the drug and monitor the speed of anesthesia administration. The safest, most comfortable anesthesia for a child in pediatric dentistry is computer anesthesia.

All of the medications used today in dentistry for anesthesia have been clinically tested in the treatment of patients as young as 4 years old. For children under 4 years of age, the issue of anesthesia is acute, because there are no safe and effective drugs approved for use in this age group yet. However, the need for local anesthesia in the treatment of patients under 4 years of age occurs quite often. When local anesthesia is not possible, sedation is used in dentistry.

Allergy testing

Allergy testing for anesthetics in dentistry is recommended:

- In the presence of an allergy to medications;
- In bronchial asthma;
- In atopic dermatitis;
- In case of blood eosinophilia;
- If the patient is often ill with acute respiratory viral infections;
- in the absence of data on the reaction of the body to anesthetics (to the patient for the first time applied local anesthesia).

It is especially important to perform allergy testing at a child's age, as children are increasingly likely to have a history of hypersensitivity to various food and drug components.

Allergy testing allows the physician to select and use the safest anesthetic for the treatment of the patient, eliminating the risk of complications.

Contraindications to anesthesia

Modern drugs for anesthesia in dentistry are low-toxic, safe. Many of them are recommended for use in pediatric dentistry, but for different groups of anesthetics there are restrictions on their use:

- hepatic insufficiency;
- decompensated cardiovascular pathologies (postinfarction, post-stroke period, hypertensive crisis, angina pectoris);
- hypertrichosis;
- epilepsy;
- bronchial asthma;
- allergy, sensitivity to the components of the drug;
- blood clotting disorder;
- hemorrhagic diathesis;
- diabetes mellitus, etc.

When selecting an anesthetic specialist must eliminate the contraindications to its use in the patient's history to avoid adverse effects.

Complications of local anesthesia

Local anesthesia in dentistry - local consequences associated with violations of the technology of administration of the drug:

- breakage of the injection needle;
- painful sensations during injection (when using a thick needle, the rapid introduction of the drug, exceeding the allowable amount of injected anesthetic, due to tissue irritation, trauma periosteum, muscular tissue, introduction by mistake not anesthetic, and another solution)

- paresthesia due to the use of a highly concentrated anesthetic, damage to the nerve trunk by the needle during the injection;
- tricism is the result of needle injury to muscle tissue or a myotoxic reaction to the anesthetic;
- hematoma - the consequence of needle damage to a blood vessel (the risk of damage is high if the patient has blood clotting disorders, arterial hypertension, vascular disease);
- infection - a consequence of poor aseptic/antiseptic treatment of the oral cavity;
- tissue necrosis - rapid administration of a large dose of a drug containing a vasoconstrictor;
- facial nerve palsy - the result of violations of the technology of local anesthesia.

Systemic complications after anesthesia in dentistry:

1. Psychogenic - occurs against the background of decompensated psychoneurological or somatic pathology, with strong emotional tension (anxiety, fear of pain, fear of any medical manipulations). 2.

Allergic - are the result of administering a drug containing components to which the patient is hypersensitive (individual intolerance). 3.

Toxic - are manifested by rapid introduction of anesthetic into the blood vessel, the use of high doses of anesthetic, due to violations in the body of the processes of biotransformation, excretion of the drug A few recommendations from the experts

The effectiveness and safety of anesthesia in dentistry depends half on the patient's psychological state of mind and health, and half on the choice of anesthesia drug and technique. Most modern anesthetics are highly effective and low-toxic, so it is easy for a specialist to choose a good anesthetic for pregnancy, for treating children, for people with a history of various chronic diseases.

The task of the specialist is to provide 100% pain-free treatment without any complications. To exclude the risks of complications associated with the use of anesthesia, it is necessary to:

- carefully examine the clinical situation, exclude all possible contraindications and restrictions for the use of anesthetics;
- if necessary, test for allergies to anesthesia;
- when selecting a method, technique, dosage of anesthesia take into account individual anatomical features of the patient and the overall clinical picture;
- comply with the technology of drug administration.

In addition to anesthesia in the treatment, restoration of teeth, bleaching is recommended to use a cofferdam (what is cofferdam in dentistry, you can read on our website). It provides additional protection against the development of allergic reactions to medications and dental materials, comfort, maximum cleanliness and dryness in the area of preparation, increases the quality of specialist's work.

11 - Text

A dental exam for a baby under 8 months of age is usually not too difficult. During the examination, he is in the arms of his mother and needs to talk to him, using vocal modulations, facial expressions, affectionate bodily touches. At the age

of 8 to 14-24 months, the baby becomes less sociable with strangers, so a normally developing child at this age will resist examination: at first he/she needs to "explore" the new situation and make sure it is safe, and only then will he/she behave calmly. The peculiarities of mental and physical development of children from 0 to 3 years old are explained in detail in the educational and methodological manual "Organization of Dental Care for Children of Various Age" by T.N. Terekhova, N.V. Kovalchuk, M.A. Shilova - Minsk: Belarusian State Medical University, 2012-c.5-7. The system of small presents after examination or necessary manipulations works very well during this period. Dental examination in the period from 1 to 3 years of age can be difficult. The child shows negativism and lack of contact. During the examination, the child is in the arms of the parents in the dental chair and each of his or her actions should be voiced by the doctor. It is also important to use different voice modulation, facial expressions, gestures. Try to distract from what is happening. Do not expect that a child of this age will be happy to make contact and let himself be examined, especially if he is coming for the first time. A child needs to examine and touch the object in order to understand its purpose. Up to the age of three, a child is only accepted in the arms of one of the parents. By the age of three, babies will feel more confident if there is a mutual understanding between parents and the doctor. It is important to explain to parents that the parents' deepest love for the child is not expressed in full compliance with the baby's requirements. Therefore, it is very important that parents understand that in this age period it is necessary to give up night feedings. Teach your baby to brush his/her teeth regularly. It is important to use verbal and non-verbal means to stimulate positive behavior of the toddler (and not so young either) at the dental appointment: - respect the child; - demonstrate genuine interest in the child; - communicate on their level; - focus on positive things; - praise and encouragement; - use the "show - tell - do" principle; - demonstrate ethical and cultural sensitivity towards the child. The period up to the age of three is very important in terms of forming a positive attitude toward a child's visit to the dentist. As a rule, those babies whose parents have started at an early age to regularly (at least 3-4 times a year) take their children to the dentist, have no problems with their subsequent dental treatment.

Rules of work of the dentist with "problem" children:

1. distract and switch attention: ask an unexpected question, make a joke, repeat his action.
2. Do not forbid anything in categorical form.
3. Listen to the child attentively.
4. Not to order, but to ask, but not to ingratiate.
5. Repeat the request in a neutral tone many times.
6. Take a picture of the child during the caprice or show his reflection in the mirror.
7. Do not lecture or compare with other children.
8. Praise at the slightest success.

Preventive care for children under 3 years of age should be primarily aimed at the prevention of early childhood caries. Therefore, the practicing dentist needs a

simple and accessible method for determining the risk of ECD for daily work. Based on the literature and our own clinical observations, we recommend the use of a risk assessment table taking into account risk factors for the development of ECD. The large number of risk factors for the development of ECD does not mean that all of them are causal or can serve to predict caries. No single risk factor has by itself the predictive power to accurately identify a child,
susceptible to RCD. Only a combination of several caries risk factors can serve to predict caries development. The factors that have the strongest influence on the occurrence of caries are such as early infections of SM children, a large amount of plaque, children's eating habits and the level of caries resistance of dental tissues. The combination of the first four risk factors with any factor from items 5-9 may indicate a high risk of a child developing RDC. It is convenient to determine the caries intensity in preschool children with a temporary bite using the formula proposed by P. A. Leus (1990) (UIC). This calculation will result in 4 levels of intensity. The presence of at least one affected tooth in children of the first or second year of life leads to their automatic enrollment in the group of high and very high risk of caries intensity. Consequently, low intensity levels are not typical for children under 3 years of age, while children 2-3 years of age may have medium intensity levels. Therefore, only children with intact dentition may have a low risk of developing caries. And children with moderate to high UIC may have a moderate to high risk of developing caries. Each group of children should have its own treatment and prevention program.


Determination of the child's general condition.

Secondary complaints are patient's sensations indicating only the presence of disease without specificity, or complaints that are related to a concomitant disease. Complaints depending on the predominant oral lesions:

- no complaints - asymptomatic course is characteristic of some stages of caries and chronic apical periodontitis in remission;
- changes in the position, size, shape and color of teeth are characteristic of non-carious dental hard tissue lesions;

- discomfort associated with chewing - getting food in the interdental spaces, with the presence of defects in fillings or artificial crowns, tooth dystopia in their mobility;
- tooth pain: 14 - pain from temperature (cold, hot), chemical (sour, sweet) and mechanical irritants, passing after their elimination (characteristic of dental caries);
- pain in the tooth from any stimuli, which persists after their elimination, spontaneous pain, fits at a certain time of day, with irradiation along the trigeminal nerve branches or without it - pulp inflammation, neuralgia; - pain in the tooth of varying intensity, arising or increasing with mechanical stress - inflammation of the periodontium, periodontitis;
- bleeding gums - periodontal inflammation of varying severity;
- tooth mobility - inflammatory periodontal disease, a symptom of hypo- and avitaminosis, diabetes, trauma, diseases of the hematopoietic organs;
- pain in the mouth, inability to eat - diseases of the oral mucosa; - dry mouth - diseases of the salivary glands, Sjögren's syndrome, Kosten's syndrome;
- hypersalivation - true hypersalivation (foot-and-mouth disease, copper salt intoxication), false hypersalivation - feeling of excess saliva when swallowing is difficult;
- bad breath - halitosis, appears with inflammation of the gingival margin, the presence of purulent discharge from periodontal pockets, diseases of the oral mucosa, a large number of destroyed teeth, poor oral hygiene, general diseases and the presence of a chronic focus of infection: chronic inflammation of the tonsils, diseases of the upper respiratory tract (ozenna, decay of malignancies of the lungs), diseases of the gastrointestinal tract, metabolic disorders (diabetes mellitus, scurvy);
- taste disorder - reduction, absence or perversion of taste sensation (consequence of lesions of the central nervous system or changes in the receptor apparatus). For diagnosis it is important to know when the symptoms of the disease appeared, its first manifestations, what the beginning of the disease is associated with, the possible causes of its occurrence; how the disease proceeded before the moment of examination: strengthening, weakening or disappearance of previously appeared or appearance of new symptoms, whether the patient previously went to a doctor for treatment, its results. When describing the history of the disease, you should not use phrases that are admissible

12 - THE USE OF STANDARD CROWNS

The use of standard crowns in pediatric dentistry dates back to the 50s of last century, but in Ukraine this trend has started to develop actively only recently.
They are called "standard crowns" because they are made in advance and there are variations of sizes of such crowns (photo 1). This allows pediatric dentist to choose the right option of dental crown without making impressions (as in adult dentistry) and laboratory steps (photo 2). This crown can be placed on a child's tooth immediately during dental treatment at the clinic.

Photo 1 Standard metal dental crowns are used to restore lost hard tissue in the lateral teeth. They come in 6 sizes, allowing you to choose the right crown for each clinical situation

Photo 2 Standard aesthetic dental crowns come in a variety of sizes to help achieve proper tooth function and high aesthetics

While standard metal crowns have been used to treat dental caries and its complications in the past, the use of standard aesthetic dental crowns in pediatric dentistry has only begun to develop in the last few years.


Metal dental crown. The shape and size of metal crowns are chosen so that you can quickly select and install the desired crown.

The most common aesthetic standard crowns include metal crowns covered with composite (strong and durable material), zirconia and composite crowns. The dentists in our pediatric department are always going out of their way to provide expert care to our young visitors, so we couldn't avoid this important topic.

Metal-composite dental crowns have a metal base, externally covered by composite material

In the pediatric department of Dubnova Clinic STOMATOLOGY we actively use both standard metal crowns and standard aesthetic crowns to treat the consequences of caries in children and to preserve children's teeth. We also actively share our experience on this topic and conduct training seminars and practical master classes on this topic for pediatric dentists from all over Ukraine

Zirconia dental crown is made of zirconium dioxide - a very durable and aesthetic material

Crowns in children? Yes!

Many parents, when it comes to the use of dental crowns for dental treatment of their child, are genuinely surprised, because they do not even realize that its use is possible in children. Firstly, parents think that crowns - is the prerogative of adults only, and secondly, they honestly believe that the child does not need a crown at all, because baby teeth will fall out and therefore it is a waste of time, money and efforts of parents and children. But is this true?

Dental crowns are successfully used for dental treatment not only for adults, but also for children.

They help preserve decayed baby teeth until permanent teeth emerge. After all, a temporary tooth is supposed to function in the mouth for 5 to 10 years, providing chewing, speech formation, aesthetics, and saving space for the permanent tooth

A dental crown that has functioned successfully for more than 5 years

Why is a crown better than a filling? Why a crown? Why can't I just get a filling?

There are indications for both a dental crown and a filling (restoration). However, due to the fact that for a long time crowns were difficult to obtain in Ukraine, pediatric dentists had to put fillings where there were indications for crowns long ago. Because both fillings and dental crowns are good when used as indicated, there are indications for the use of crowns.

Crowns are recommended in the following situations:

- When more than 50% of the tooth's hard tissue has been lost. In this case, the size of the filling by volume exceeds the amount of their own tooth tissue, which significantly increases the likelihood of chipping or total loss of such a filling.
- When several surfaces of the tooth are affected by decay. In this situation, too, a crown restoration is indicated, because it is difficult or impossible to isolate the tooth from saliva for a good filling

A tooth affected by decay

Tooth condition after preparation of infected tissues

Tooth condition before treatment

Condition of the tooth after removal of carious tissues, partial removal of the pulp due to inflammation (most of the hard tissues of the tooth are lost). Isolation of the working field is carried out with the "cofferdam" system

Restoration of lost dental hard tissue with a zirconia crown (adjacent tooth restored with composite material)

- In cases of poor oral hygiene. There are situations when a child or parents cannot have their teeth cleaned properly. This can be due to objective factors (difficulty opening the mouth, etc.) and subjective factors (child's behavior,

inability to properly focus, etc.). It can also be difficult to clean certain areas of the tooth(s). Materials used for fillings quickly lose their ability to bond to the tooth in areas of poor hygiene, causing secondary caries. A crown, on the other hand, overlaps the tooth completely, so the chances of secondary caries are negligible. Especially in children with special needs, where personal hygiene is not always possible, the use of dental crowns is especially important.

Aesthetic zirconia crowns for anterior teeth

Before treatment: 1.8 year old child, front teeth significantly decayed, one tooth broke off due to decay weakening, hygiene was difficult (significant amount of plaque). Due to the significant amount of treatment, young age of the patient and lack of cooperation, the treatment took place under medically assisted sleep

Condition of teeth after preparation of infected tissues and filling root canals due to pulp inflammation

Immediately after the placement of dental crowns (gums slightly traumatized)

After 2 weeks at checkup - excellent condition of dental crowns and gums

Covering teeth with crowns is recommended for dental malformations of the hard tissues, when restoring teeth with fillings is problematic.
Use of metal dental crowns for dental hard tissue malformations

Imperfect amelodentinogenesis (Stayton-Cappepon syndrome) is an inherited genetic lesion of dental hard tissue. The hard tissues of the teeth wear away and chip away much faster than normal


Restoration of the lateral group of teeth with metal crowns (front teeth restored with composite materials). Without proper treatment, these teeth wear down to the gums in 1-2 years, and thanks to the covering with crowns will function successfully until the physiological change to permanent teeth

The advantage of using a standard crown in pediatric dentistry over restorations/ fillings is that after restoring one surface with a filling, decay may occur on the other four surfaces of the tooth, and each surface will need to be filled again. However, when a crown is placed, it once and for all covers all surfaces of the tooth and makes it impossible for germs to access the tooth tissue, thus blocking the further possibility of decay in that tooth.

Do I have to grind down my neighboring teeth to have a crown placed?

Crowns in pediatric dentistry are only placed on the damaged tooth and do not affect the neighboring teeth in any way. Therefore, it is not necessary to grind down the neighboring teeth.

How will a tooth with a crown fall out?

A standard crown when placed only covers the outer, crowned part of the tooth, not touching the root of the tooth, so it does not affect the root of the tooth in any way and the natural change of teeth. Thus, the root of the temporary tooth dissolves under the influence of the rudiment of the permanent tooth, which fits, and the crown falls out along with the part of the tooth that remains. Therefore, the crowned tooth falls out like any temporary tooth.


Dental crown in the mouth


A tooth crown that has fallen out

Permanent tooth in place of a crown

Can the crown fall out (uncemented)? What should I do in this situation?

Uncemented crowns are very rare. The reasons are the difficult conditions under which the crown is placed, e.g. difficult isolation of the tooth before placing the crown, considerable loss of hard tissue, etc. In such cases, the dentist must create the conditions for a secure fit and re-cement the dental crown.

In the practice of our pediatric dentistry there have been isolated cases (2 in 7 years) of uncemented crowns. In both cases it was caused by a severely damaged tooth, when we had no possibility to fill it and had to choose between a crown or extraction. After the individualization (correction of the crown with special instruments) and re-fixation of such crowns, they continued to perform their functions successfully, and thus we were able to avoid the removal of teeth that should have lasted more than 4 years.

Can a dental crown break and what to do in such a situation?

Metal crowns cannot break. Chipping may occur in aesthetic crowns if influenced by factors of significant force, such as trauma. In such a situation, the dentist can correct the crown with restorative materials or replace it.

Can decay develop under the crown?

If the tooth is properly prepared, correctly fitted and mounted, the development of tooth decay under the crown is impossible.

How should I clean my teeth after the crown?

Dental care after the crown is not much different from ordinary dental care. However, it is important to remember that decay does not occur on the crown, but it can occur on the neighboring teeth. With insufficient hygiene, plaque can accumulate on the crown like on your own teeth, it will not affect the tooth under the crown, but will provoke inflammation in the gums. Therefore, proper brushing twice a day is mandatory!

Is it possible for a child to have discomfort after the crown?

When preparing a tooth for a crown, it is necessary to treat the tooth at the gumline or (to a small depth) under the gumline. This preparation is usually done under local anesthesia, so after the local anesthetic wears off, there may be some discomfort in the area, which fully subsides in 1-2 days. Another area of temporary discomfort may be the occlusion of the teeth. Because the crown is a standard crown and is not bite-corrected, it may be uncomfortable for your child's teeth to clench at first. But depending on the number of crowns fitted, the situation will normalize within one to a few days.

Can a crown be placed without anesthesia (medication sleep)?

Dental crowns can be placed both under medically assisted sleep (under anesthesia) and under local anesthesia.
Use of four metal composite dental crowns without the use of medically assisted sleep, only under local anesthesia


Before treatment: 3-year-old child, teeth almost completely decayed


Restoration of teeth with metal-composite crowns (external composite coating)


Internal surface of metal composite dental crowns


Excellent condition of dental crowns and surrounding gums at the control examination after 14 days

However, when we work in medically assisted sleep, we more often opt for crowns, because we more often treat children whose teeth are significantly destroyed by decay or have significant difficulty with individual hygiene (or both) in sleep. And when a crown is placed, the likelihood of a tooth chipping or decay reoccurring in it is minimized. At the same time, decay can occur on other tooth surfaces in the filled teeth, and this sometimes happens so quickly that by then we

can't work on the child with only local anesthesia and have to re-treat them in their sleep.

Which crowns are better aesthetic or metal? What material are crowns made of?

Each dental crown has its own indications. Metal crowns are definitely not indicated in the aesthetic area (smile zone) because they can significantly affect the aesthetics of a child's smile and self-esteem.

Metal crowns are made from a chrome-nickel alloy that is commonly used in dentistry for a variety of designs. They are cheaper and take less time to prepare the tooth. Metal crowns are contraindicated if you are allergic to its components (nickel or chrome). However, nickel allergy rate is less than 0.1% and in the time of using dental crowns in our clinic there has not been a single case of allergy to the crown material.

Aesthetic crowns, besides the advantages inherent to the metal, have a better aesthetic appearance (in fact, they are not visually different from a normal tooth), and can be used both in the lateral and in the frontal area to restore the lost hard tissue. In addition, the aesthetic crowns that we mostly use in our dental clinic are made of zirconium dioxide, a special material that has one of the highest degrees of biocompatibility and minimal possibility of plaque accumulation on the crown today. However, they are more expensive than metal crowns.

13 - Text

Why it's important to prepare your child psychologically for dental treatment

- Your child will be ready to go to the dentist in the future without fear
- He/she will learn what the treatment may feel like and will not be afraid of the unknown
- The doctor will make friends with the little patient and find a common language
- Your child will get to know the dental unit, instruments and materials beforehand, and how they work
- The treatment will take place in an already familiar environment with the doctor as a friend

What the child will get at the adaptation appointment

1. Understand what will happen in his/her mouth: will it be wet, cool, buzzing, etc.
2. He/she will see the difference between what was "dirty" and what was "clean".
3. He will get acquainted with a kind doctor who speaks in understandable children's language without abstruse phrases.

A playroom for quiet waiting
With modern toys

Cartoons during treatment,
that the baby can choose for himself or herself

Sensitive doctors,
specially trained to work with children

A gift after the reception,
To make your child leave in a good mood

How to prepare your baby for dental treatment at home:

- Talk about a visit to the dentist as an interesting but ordinary event.
- Call the dentist by name, and explain that he is a friend who makes teeth beautiful.
- Make the encouragement small, but valuable to the child. This way you will reinforce the positive emotions after the visit to the doctor.
- To keep your child calm, talk to him or her in a positive mood ("everything will be fine"), use words without the particle "not".
- Don't tell your child what he or she is going to do. Trust the doctor, the doctor will determine what the child is ready to hear, and what it is better not to say. Be ready to play along with the doctor and encourage dialogue with your child.

It is best for your child to visit the doctor nourished, but not overfed and with plenty of sleep. For the first visit to the clinic, and for impressionable children, we recommend choosing the morning time, so the child is not thinking about the upcoming visit all day long.

When a child visits the dentist, the biggest fear is the drill. Dental interventions are associated with pain and other unpleasant feelings more than others. Therefore, the problem of premedication is especially relevant in pediatric dental practice. Psychological and Pharmacotherapeutic interventions for anxious children with heightened emotional reactions relieve excessive tension.

Premedication is broadly defined as the administration of any medication as part of dental treatment. It would be incorrect to assume that the sole purpose of medication preparation is to alleviate fear of treatment. This task, although important, is far from being the only one. The field of activity of premedication is

much broader. In some cases, it is used to reduce tension and fear; in other cases, it is used to lower the threshold of susceptibility to pain and also to ensure an undisturbed course of treatment by suppressing the gag reflex or reducing salivation (premedication). A similarly important task of premedication should be considered to ensure a smooth postoperative course, the possibility of restful sleep, eating, etc.
(post-medication). In the vast majority of cases, premedication is intended to address several disruptive influences simultaneously.
In the fight against fear, on the contrary, premedication always plays only an auxiliary role, with psychoprophylaxis and psychotherapy remaining the main means here and in the future. Even the best medical preparation cannot compensate for lack of psychological knowledge and sparing treatment of the child.
Drug preparation is based in pediatric dentistry on two main indications: first, it is used to ensure a smooth course of treatment for long and serious interventions, and second, to improve conditions for treating children who are not cooperating with the doctor. For premedication, small tranquilizers - sibasone and mebicar in an age-appropriate dosage 30-40 minutes before treatment is prescribed. For younger children, it is preferable to
use sibasone, and to achieve a stronger tranquilizing effect - a combination of sibasone and mebicar.
Premedication is carried out taking into account the type and degree of severity of the psychoemotional reaction. The use of tranquilizer 0.05 seduksen, 0.3 g trioxazine, diazepam 0.3 g, non-narcotic analgesic - analgin; antispasmodic - baralgin in combination with 0.02 g relanyum (in solution) - 15 min before the treatment; cholineolytic atropine (v/m); Corvalol, Valocardine C0 drops); Valerian drops, motherwort D0 drops) in the out-patient department is effective.
You can use 20-25 minutes before the therapeutic manipulations 1% dimedrol, suprastin, tavegil, pipolfen (in solution).
Application of these drugs allows to eliminate emotional and vegetative components of pain (reduction of anxiety, fear, restlessness, elimination of psycho-vegetative complications manifested by tachycardia, hypertension, hyperglycemia, asthma attack, syncope or collapse), as well as to reduce the frequency of general complications, which are more associated with psycho-emotional tension of the patient, significantly improve the anesthesia effect and potentiate local anesthesia.
Various methods of anesthesia are used to anesthetize the pulp: infiltration, conduction, application, intraligamentary, reflexoanalgesia, electrical anesthesia, as well as anesthesia: mask, intubation, intravenous.
What should be done to keep a child's teeth healthy?

Firstly, a checkup of the child's mouth by a pediatric dentist is required, who will check the baby's oral cavity, identify the initial processes of tooth decay, provide preventive and necessary treatment procedures, give advice, and teach how to properly care for the teeth. You have to go to the dentist at least 2 times a year!

Secondly, follow the recommendations written in the handout below, and then your child's teeth will stay healthy for a long time.
To keep teeth healthy, you must:

1. brush them thoroughly 2 times a day: in the morning after breakfast and in the evening after dinner - before going to bed.

Very often parents ask the question: at what age should care for teeth begin? The answer is easy - from the time the baby's first teeth appear, i.e. from about 6 months of age. For this purpose it is necessary to use water-soaked sterile gauze wipes or special disposable wipes for brushing teeth, which you can buy at the drugstore (for example, Spiffes). Wrap the wipe around your index finger and gently wipe all sides of your teeth, as well as your gums, palate and tongue. Alternatively, you can use a special silicone fingerstall, which is also placed on the index finger and moistened with water.

When the child gets used to carrying out any manipulations in the mouth (from one year) it is necessary to buy a toothbrush. It should be selected according to their age. The working part of the toothbrush should not be big, but small, so it can reach the farthest teeth. You should replace the toothbrush at least once every 3 months, or more often, depending on its quality. Toothpaste we recommend to use from one year, it should also be chosen according to the age, to put a toothpaste on a toothbrush should be as small as a pea. Toothpaste should be bought from the drugstore, well-known companies (R.O.C.S, Elmex, Colgate, Blend-a-med, Lacalut, etc.).

From the age of 1.5 to 2, teach your child to rinse their mouth.

For children under two years of age it is best to use fluoride-free toothpastes (First teeth, R.O.C.S. baby) or low-fluoride toothpastes (Elmex Kinder-Zahnpasta, Colgate Kids, Kids Pearl Complex).

For children over the age of two, children's toothpastes containing fluoride are recommended (Stages Oral B, R.O.C.S. Kids, Carimed Kids).

When all 20 baby teeth will have erupted (about 2 1/2 years) and there will be tight interdental contacts between them, the toothbrush cannot completely clean food debris and plaque between the teeth, so start brushing daily with floss or irrigators. This procedure should be done by the parents until the child learns to floss on their own.

Brushing should take from 3 to 5 minutes, depending on the number of teeth and the child's bite.

The upper jaw should be brushed first, then the lower jaw, successively, from right to left, or left to right, sweeping from the gum to the edge of the tooth ("pink to white") - on the front (lips) surfaces and the back (palatal and lingual) surfaces, and reciprocating movements ("forward to back") - on the chewing surfaces. Finally, massage the gums in a circular motion with the brush, grasping the teeth and gums with the jaws closed. And do not forget to brush the tongue using the brush bristles or the special surface on the back of the brush, because the back of the tongue has a large number of filiform papillae, between which accumulates a significant amount of plaque.

It is believed that parents should always help children brush their teeth before school age because of poorly developed fine motor skills, and sometimes the parents' help is necessary even at an older age.

If necessary, carry out control of the brushing of teeth. You should use special tablets or solutions that stain plaque (e.g., Dinal, President).
2. Rinse your mouth after each meal with water or special solutions, tooth elixirs, rinses that prevent plaque formation. In addition, at home once a week you can do rinses with 2% soda solution (alkalizing effect, neutralizing acids) and 2% table salt solution (reduces the pathogenic microflora of the mouth and increases the resistance of enamel to caries factors).
Chewing gum with calcium ("Orbit for children with calcium") is used in children from 4 years for 10-15 minutes after meals, but not as a substitute for toothbrush and toothpaste.
Limit the number of snacks during the day. Frequent snacking can cause plaque buildup. If you can't give up
snacks - eat fruits and vegetables, cheese, cottage cheese, nuts, wash down with water or unsweetened tea.
4. Limit intake of sweet, floury, starchy, soft and sticky food (cookies, breadcrumbs, rusks, chips, popcorn, rolls, chocolate, cakes, ice cream, sucking candies, toffees, candies, caramel, dried fruits, honey), canned and refined food, Sour foods (lemon), pickles, as well as sweetened carbonated drinks (lemonades, kvass, Coca-Cola), juices, including freshly squeezed juices, especially those consumed through a tube (apple, citrus, grape, etc.), because they contain a high content of sour milk. The most important thing to remember is not the amount of juice you drink, but the amount of juice you drink. Remember - the main thing is not the amount of carbohydrates, but the frequency and duration of their consumption! For example, it is better to eat a whole bar of chocolate at once (and then go and brush your teeth or eat alkaline products), than to eat this bar in a piece every day, or it is better to eat a piece of chocolate than to keep a lingering cheek to chew a chupa-chup! Feel the difference?
5. Eat healthy foods: Fruit (apples, pears), vegetables (carrots, cabbage, topinambour), dairy products (milk, cottage cheese, hard cheese), sugar-free sour milk products (kefir), buckwheat and oatmeal (no sugar), seafood (calamari, shrimp, crabs, fish), meat, eggs, greens (parsley, dill, spinach, green onions), garlic, nuts (hazelnuts, almonds, walnuts), poppy seeds, sesame seeds, legumes (beans, peas), dark bread with crust (baked, rye). It is better to replace the harmful drinks listed above with plain water or green tea.
6. And of course don't forget to go for a preventive check-up with your dentist twice a year! He or she will brush your child's teeth with a special toothbrush and toothpaste, treat them with special products to make them stronger, and seal new chewing teeth by covering their cavities with a protective material.
The doctor will certainly draw the parents' attention to the particularities of the child's bite, i.e. the occlusion of the upper and lower teeth. It is important to identify bite anomalies and correct them in time. In particular, it is necessary to eliminate bad habits - long pacifier sucking, finger sucking, tongue sucking, cheek sucking, etc. It is also important to notice the difficulty in breathing. This happens with diseases of the nose and sinuses.

Thus, the preventive reception is a set of measures.

Many years of experience in preventive measures for children shows that a child whose parents have started to monitor the health of his oral cavity in time and conduct preventive procedures, does not know pain, trusts the dentist and is happy to go for preventive check-ups.

14 - Text CLASSIFICATION OF METHODS OF ANESTHESIA IN DENTISTRY

Local anesthesia is a set of methods of prevention of conduction or blockade of afferent impulses from a limited area of tissues at the level of the peripheral nervous system. Its implementation is shown in the anesthesia of relatively short-term, low and moderately traumatic interventions, carried out in patients without severe comorbidities, patients with an uncomplicated allergy history to local anesthetics. The combination of methods of pain sensitivity blockade at the CNS level is called general anesthesia. General anesthesia is indicated in patients with overwhelming anxiety and fear before treatment, with allergies to local anesthetics, when planning a long and traumatic treatment manipulations, patients with co-morbidities that require postoperative treatment or monitoring. The simultaneous use of methods of local and general anesthesia is called combined anesthesia. Such a combination is used to reduce the total dose of drugs, to reduce their toxic effects on the body and is shown to weakened patients in a state of intoxication and with liver disease. The use of different means or methods of anesthesia within a single method (general or local) of anesthesia is called combined anesthesia. For example: the simultaneous or sequential use of cold and local anesthetic in local anesthesia or intravenous and inhalation anesthesia in general anesthesia, to reduce the risk of general anesthesia, to smooth out the undesirable stage of anesthesia arousal. 30 The use of different agents in one method of anesthesia is called multicomponent anesthesia. For example: the use of several general anesthetics in intravenous anesthesia, which reduces the dose and thus the toxic effects on the body of each of them. Depending on the nature of the anesthetic agents there are: physical (mechanical, electrical, electromagnetic, acoustic, optical), chemical (local and general anesthetics) and mixed (physical and chemical) methods. Depending on the route of administration of anesthetic substances there are: non-injection (not accompanied by damage to the skin and mucous membranes), injection (accompanied by skin damage or mucous membranes), inhalation, based on the introduction of anesthetic gas or vapor through the lungs, intravenous, intramuscular, based on injecting anesthetic directly into the bloodstream or into the muscle, where it creates a deposit, oral and rectal anesthesia techniques. Methods of local anesthesia depending on the level of blockade of sensitive impulses are divided into: superficial (blockade of sensitive receptors), infiltration, based on impregnation of tissues with anesthetic (blockade of nerve plexuses and small branches), and regional or conductive (blockade of nerve branches and trunks). Superficial local anesthesia can be performed using physical (pressure, cooling, electrical anesthesia); chemical (application, application of anesthetic in the form of a solution, cream, gel); physical and chemical (electro-, ultraphono-, magnetophoresis of anesthetic) methods and is designed to anesthetize short-term

and minor traumatic interventions (needle puncture, superficial incision). For infiltration anesthesia is used:

injection (intraosseous and intradermal, submucosal and subcutaneous, indirect and direct, layer-by-layer, case 31 fascial, subperiosteal, intraosseous, intraligamentary, intrapulpalpal) and physicochemical methods (electro, ultraphono or magnetophoresis). Injection infiltration anesthesia is indicated to anesthetize a small area of tissue within the zone of its impregnation. The indication for the physico-chemical method of anesthesia is a chronic pain syndrome in nerve diseases, musculo-articular pain. For conduction anesthesia in the maxillofacial area using the injection method, by which the depot of anesthetic creates in the area of one or more major branches of the trigeminal nerve, performing their blockade. Conductive methods of anesthesia are named according to which branches they block (suborbital, palatal, incisal, mandibular, chin, maxillary, mandibular), or in which place the anesthetic is applied (tuberal, torusal). Conducted anesthesia is indicated in cases where infiltration anesthesia cannot be effective (the body and branch of the lower jaw), if the area of the intended anesthetic is contraindicated needle puncture due to inflammation or for cosmetic reasons, with large volume of interventions. Methods of general anesthesia, depending on the level and mechanism of action on the CNS are divided into: anesthesia, which causes complete unconsciousness; neuroleptanalgesia, based on the administration to the patient of a neuroleptic that induces a state of indifference and detachment in combination with a central analgesic that reduces pain syndrome; ataralgesia, the combined use of a tranquilizer that eliminates fear and anxiety, with a central or non-narcotic analgesic electroanalgesia, which inhibits cortical activity and is represented by combined electronarcosis, percutaneous electroneurostimulation, analgesia using direct electric current of certain parameters, electrosleep; reflexoanalgesia, which starts the antinociceptive system and includes electropuncture, acupuncture, auriculopuncture, laser puncture. There are the following types of anesthesia according to the method of application: inhalation (mask, nasopharyngeal, endotracheal, endobronchial, through tracheostoma); noninhalation (intravenous, intramuscular, oral, rectal); combined and multicomponent. A separate position is occupied by hypnosis - anesthesia through suggestion of necessary information to the patient, introduced into a state of altered consciousness, which is characterized by concentration of attention on the idea being suggested. It should be noted that electric anesthesia and reflex analgesia are not widely used in dentistry, as they give a low percentage of successful and complete cases of anesthesia, require special training of the doctor.

Requirements for local anesthetics
The ideal anesthetic should:
1) Be highly selective. 2) Have minimal general resorptive effects. 3) Do not irritate tissue at the site of application. 4) Have

fast action, sufficient depth and duration of anesthetic effect. 5) Well soluble in water and not destroyed by sterilization.

INSTRUMENTS AND DEVICES FOR LOCAL ANESTHESIA. TYPES OF INJECTORS, NEEDLES. CARPULES .

An important step in the development of local anesthesia was the use of injectable methods of anesthesia, which became possible after the invention of the syringe and the hollow needle. Designs that allow the injection of therapeutic liquids into the tissues through the needle, having undergone evolution in development, are now represented mainly by disposable and carpel syringes. To a lesser extent, the needleless injector and even more rarely the computer syringe are used in local anesthesia in domestic dentistry. For many years in Soviet dental practice, reusable glass syringes of 2 and 5 ml capacity with needles 30-80 mm long and 0.5-0.8 mm in diameter were used. These syringes were sterilized by boiling in metal cuvettes along with needles, with mandrels inserted into the lumen to maintain needle permeability. Reusable syringes quickly became unusable, needles became blunt. Therefore, they are not currently used. Disposable plastic syringes used in dentistry have a number of advantages over reusable ones: they do not require sterilization, are easy to use, always contain a set of sharp needles with a smaller diameter than reusable ones, leak less often, damage soft tissue less. 1 and 2 ml syringes should be used because they allow you to dose the amount of anesthetic injected more accurately. Each syringe has a cylinder with volume markings, a piston, and a removable or non-removable needle. The syringe is sterilized with ethylene oxide and sealed in a paper-polyethylene or polyethylene bag. The cylinder of the 1 ml insulin syringe is marked in insulin units, four units contain 0.1 ml of solution. On the cylinder of the syringe of 2 ml are marked with divisions

GENERAL ANESTHESIA. DEFINITION, TYPES, INDICATIONS, CONTRAINDICATIONS STAGE OF ANESTHESIA

Anesthesiology owes its development largely to maxillofacial surgery, which is due to the peculiarities of operations in this area and the difficulties in their anesthesiological support. It is no coincidence that the first (officially recognized in medical history) anesthesia was performed during surgery in the maxillofacial region. In the operating room of the Massachusetts General Hospital in Boston, USA, on October 16, 1846, William Morton administered his first ether anesthesia to a patient who had a lateral cyst of the neck (according to other reports, it was a vascular tumor of the submandibular region) removed by surgeon John C. Warren. Interestingly, two years before this event, Horace Wells had made his first unsuccessful public demonstration of nitrous oxide anesthesia in a tooth extraction in the same operating room. The endotracheal technique of general anesthesia also began to emerge in maxillofacial surgery. A few months after the discovery of ether anesthesia, N.I. Pirogov, one of the first in

Russia who tested ether sedation in clinic and experiment, wrote: "... In operations carried out in the mouth and especially over a pharynx, difficulties appear because of spastic compression of jaws because in such a case it is difficult to attach properly an ether device and to clear mouth from blood and saliva, which separation is usually amplified owing to ether inhalation". N.I. Pirogov. Notes on

medical sciences. Narcosis (Greek νάρκωσις - numbness, stupor); synonyms: general anesthesia, general anesthesia - artificially induced reversible state of central nervous system inhibition, which causes sleep, loss of consciousness and memory (amnesia), relaxation of skeletal muscles, decrease or disabling of some reflexes, as well as pain sensitivity loss (general anesthesia). All this occurs with the introduction of one or more general anesthetics, the optimal dose and combination of which is chosen by the anesthesiologist based on the individual characteristics of the patient and the type of medical procedure. Anesthesiological maintenance of operations in maxillofacial surgery has a number of features: - the anesthesiologist's area of interest is adjacent to the operating field. There is no usual for most anesthesiologists arc on the operating table, which separates the immediate zone of anesthesiologist's "interest" - the patient's head and the operating field zone - the torso or limbs; - ensuring sealing of airways from blood, saliva, mucus, broken teeth, bones, etc. The presence of wounds, defects in the mouth or nose area or localization of neoplasms in this area it is not always possible the usual ventilation through the face mask, even during the introduction anesthesia; - anatomical and physiological features of the maxillofacial area: high vascularization of tissues, on the surface area of 9% of the entire body all sensory organs are concentrated, 12 pairs of cranial nerves exit; the digestive tract and airways begin; - the maxillofacial region, having anatomical features, is a powerful reflexogenic zone, oral cavity tissues are highly sensitive; - during anesthesia, there is no possibility of monitoring the patient's condition and the depth of anesthesia by the usual signs (pupillary and ciliary reflexes, the color of the lips and mucous membranes of the mouth, reflexes in the head and neck), since the patient's face and neck during surgery are hidden by sterile sheets; - it is impossible to constantly monitor the position of the endotracheal tube, the laryngeal mask. Restoration of muscle tone, especially muscles of the tongue and oropharynx, as well as independent breathing in dental patients is crucial and determines the condition airways. The peculiarities of anesthesia in maxillofacial surgery lead to a constant search for new methods that meet the requirements of safety and comfort for the patient and convenience for the operating surgeon.

15 - Text

Almost everyone goes to the dentist at least once. And special attention should be paid to children's teeth. Many young children already have tooth decay at an early age. And children with disabilities are the most vulnerable in this regard. Unfortunately, not every doctor will treat a child with diagnoses such as epilepsy, cerebral palsy, Down syndrome, autism, etc. which are directly connected with the central nervous system. Such patients require a special approach and professionalism so as not to harm or aggravate the underlying disease. That is why the clinic "New Century" offers to take advantage of professional dental services and get qualified dentist help for children with disabilities.

Difficulties in treatment: Until recently, such a concept as "disability" caused nothing but indifference or mild sympathy. After all, not every family faces such a problem. But it is not only the disabled people themselves, but also their relatives, who suffer from this. And the worst thing is when the mother learns about the child's terrible diagnosis and cannot do anything to help him or her. Today, relief funds and treatment and rehabilitation programs for disabled children have been established all over the world, and modern society no longer looks past the problem, but is ready to help and support.

Down syndrome is a form of chromosomal abnormality in which the karyotype is represented by 47 chromosomes instead of the normal 46; the 21st chromosome is found not in two (normal) but in three variants. Down syndrome is the most common genetic abnormality, with an average of 1:850 newborns, and the incidence is independent of the gender of the child. The occurrence of Down syndrome does not depend on the lifestyle of the parents, but there is a proven link between the incidence of the syndrome and the age of the mother. If the mother is 20 to 24 years old, the probability is 1:1562, up to 30 years old - 1:1000, 35 to 39 years old - 1:214, over 45 - 1:19.

Unfortunately, the "sunny" children are very susceptible to childhood illnesses, especially ENT-organ disorders, which is associated with disorders of metabolic processes (thyroid dysfunction). Because of this early childhood caries develops very quickly, which is characterized by almost sudden course. Very quickly the

caries process destroys a milk tooth, affecting the nerve, and then the inflammation penetrates the bone tissue, damaging the rudiments of permanent teeth.

You should also take into account the peculiarities of the oral structure of children with Down syndrome:

- High, narrow arch-shaped palate, so sounds are more nasal (occurs in 58% of cases)
-Teething habits: teeth appear later, usually not in the same order as in normal children, and are often missing the rudiments of one or more permanent teeth (65% of cases)
- Small, narrow upper jaw, so the teeth grow too closely together, making it difficult to perform good oral hygiene and increasing the risk of tooth decay.
- Open bite: In this type of bite, the upper and lower jaw teeth do not meet at the front.
- Relatively large, furrowed tongue (occurs in 50% of cases)
- Low sensitivity of the oral receptors, which is why sunny children prefer soft food and therefore don't naturally clean their teeth
- weak muscles in the temporomandibular joint
- Predominantly mouth breathing

Because of these characteristics, children with Down syndrome have a high incidence of oral disease. And the incidence of carious lesions is not inferior to diseases of the oral mucosa. Stomatitis and gingivitis are common, which already in adolescence develop into chronic periodontal disease. These children need to undergo preventive dental check-ups in a timely manner and receive timely treatment.

The best thing for a child with Down syndrome is strict and rigorous compliance with the individual preventive dental care program developed by the pediatric dentist supervising the child. After all, it is very rare that a child successfully adapts to dental treatment under local anesthesia. But, unfortunately, parents encounter problems in the development of their

The dentist is not the only one who has to treat other diseases of the organ systems, and they overlook dental health. And they come to the dentist's office with acute pain. Even a cursory examination reveals, as a rule, multiple carious lesions, which in itself is very difficult to treat. Generally, if there are no direct contraindications, the treatment is performed under general anesthesia, using the latest generation of Sevoran inhalation anesthetic.

This is the only way to perform a high quality and stress-free treatment of the oral cavity for a child and to treat a large volume of cases at once. In this situation, only anesthesia treatment can solve the specific problem and allow the child with Down syndrome to adapt to preventive procedures in the future.

16 - Text

Deformity of a baby tooth is not as harmless as it may seem at first sight. In addition to the aesthetic defect and inconvenience of chewing thoroughly, babies are at an increased risk of poor diction and a significant increase in pressure on neighboring teeth, which leads to an incorrect bite. Furthermore, only a properly shaped tooth will last long before being replaced by a permanent tooth, so if you don't give your child a tooth restoration in time, you run the risk of losing a baby tooth.

Milk tooth restoration is a partial or complete restoration of a tooth. Depending on the degree of damage, the restoration can be made with a composite or a baby crown can be used. Milk tooth restoration is prescribed by the dentist when there is severe carious decay or when it is necessary to restore the integrity of the traumatized tissue - a part of the tooth has chipped away. This procedure is necessary even if the child is not ill, because only the correct shape of the tooth ensures the formation of a normal bite and an aesthetic smile.

During the restoration of deciduous teeth the dentist's aim is not only to restore the masticatory function of the tooth, but also to achieve maximum aesthetic effect - the restored tooth should look like a real tooth, i.e. it should have anatomic shape and the same color, which is especially important in the treatment of front teeth.

Indications for dental restorations

Restorations of deciduous teeth in children are carried out in the following cases:

- The tooth enamel is chipped or the dentin is damaged due to mechanical impact;
- The tooth is more than 40% decayed, or 1-2 of the tooth walls have already been damaged due to advanced dental caries;
- Insufficient aesthetics, for example, the enamel has acquired a dark color.

There are no contraindications to restorations of deciduous teeth, depending on the clinical case, the pediatric dentist selects the appropriate method of dental restoration.

Methods of restoration

During the consultation, the dentist chooses the method of restoring the deciduous teeth based on the clinical picture.

Dental restoration can be done in two ways:

Restoration with composite materials. Direct aesthetic restoration with composite material is used in cases of superficial enamel damage. The main advantage of this approach is the ability to select the shade of the material so that the restored tooth does not differ from the natural tooth.

The hard tissue is prepared, the composite is matched to the natural tooth enamel color and then the composite is layer-by-layer applied to the dental material and UV-exposed. The final step is the grinding and polishing of the restored element.

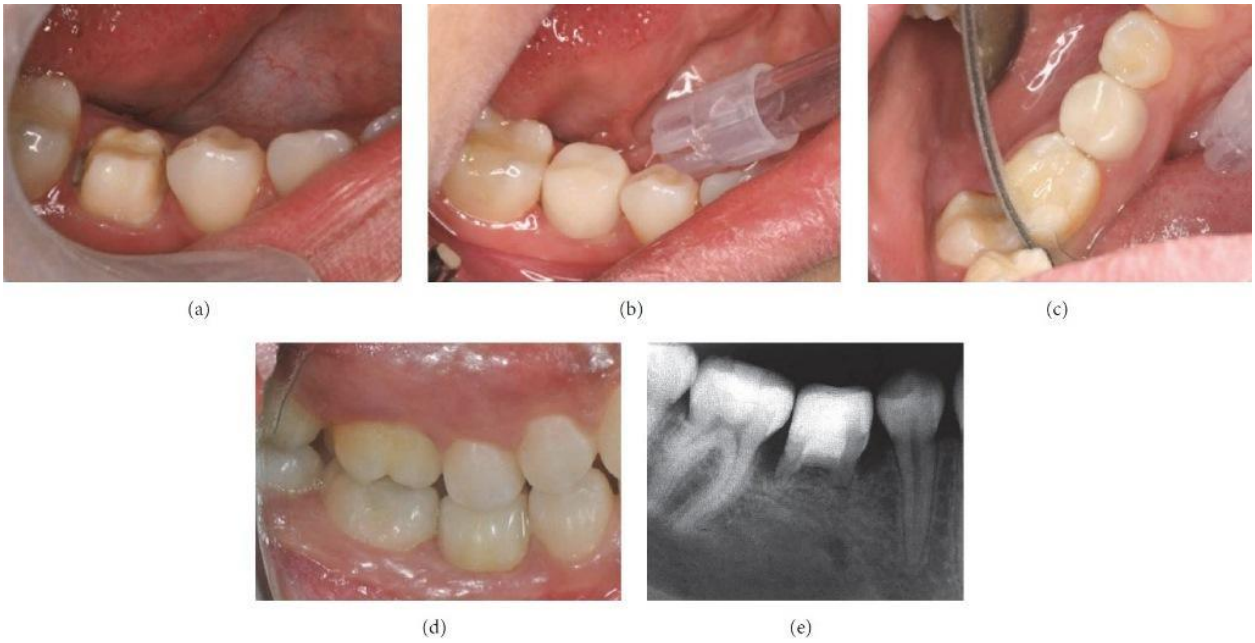
Crown restorations. If a tooth is more than 50% decayed and two or more of its walls are damaged by decay, a crown must be used to restore the tooth. In pediatric dentistry, metal or metal-composite crowns are used. They fall out with the tooth when it is time to replace it with a permanent tooth.

A crown is a "cap" placed on a prepared tooth and secured with a special cement. Metal composite crowns are used in the treatment of frontal teeth for maximum aesthetics, and metal crowns are used in the treatment of masticatory teeth.

The need for restorations

The restoration of deciduous teeth solves a number of problems at once:

- The functionality of the baby tooth is fully preserved until its natural replacement;
- the child can chew food normally and thus not provoke gastrointestinal problems;
- It is easier for the child to practice speech skills;
- bite problems are prevented;
- The child will be confident and able to smile boldly, which is especially important at a young age.



17 - Text

Dental enamel (or simply enamel) is the outer protective shell of the crown part of human teeth.

Enamel is the hardest tissue in the human body, which can be explained by the high content of inorganic substances - up to 97%. There is less water in dental enamel than in other organs, 2-3%. The hardness reaches 397.6 kg/mm² (250-800 according to Vickers). Thickness of enamel layer differs in different parts of crown part of tooth and can reach 2.0 mm, but vanishes to nothing in the cervical part of tooth.

Chemical composition

The hardness of tooth enamel is determined by its high content of inorganic substances (up to 97%), mainly crystals of hydroxyapatite - $Ca10(PO4)6(OH)2$, modified by the presence of magnesium, fluorine, carbon and some other elements. Healthy enamel contains 2-3% free water and 1-2% organic substances (proteins, lipids, carbohydrates). Water occupies the free space between the crystals and in the organic base.

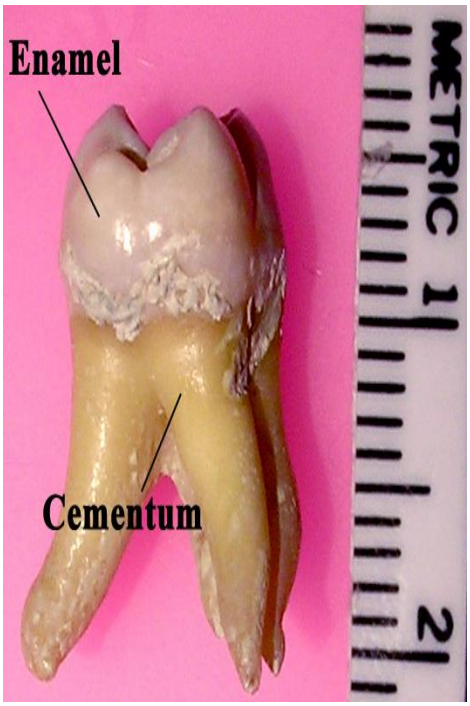
Hydroxyapatites are very susceptible to acids and begin to break down markedly at pH < 4.5 (saliva has a pH of 5.6 to 7.6).

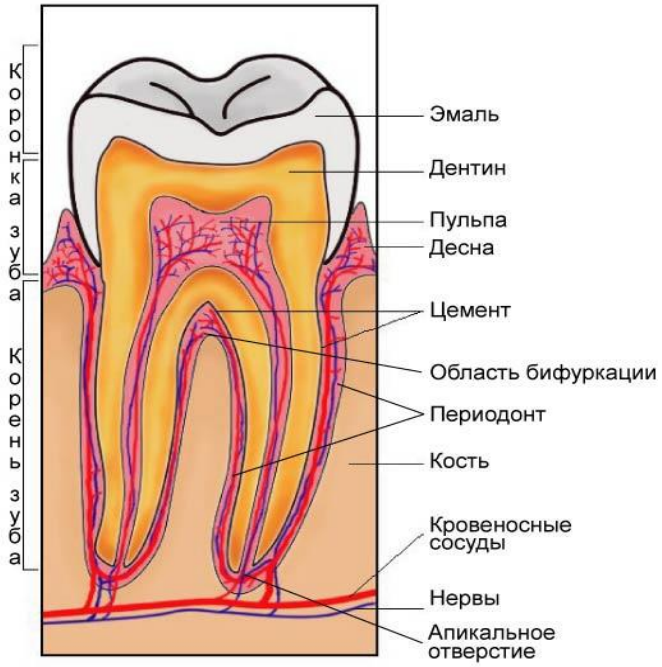
Anatomic and histologic structure

The main structural formation of enamel is the enamel prism (4-6 μm in diameter), consisting of hydroxyapatite crystals. The interprism of enamel consists of the same crystals as the prism, but they differ in orientation. The outer layer of enamel and the inner layer at the dentin-enamel boundary do not contain prisms (prism-free enamel). These layers contain small crystals and larger lamellar crystals.

There are also enamel plates (lamellae) and bundles in the enamel that represent the insufficiently mineralized interprismal substance. They run through the entire thickness of the enamel.

The next structural element of enamel is the enamel spindles - bulb-like thickenings of odontoblasts that penetrate the dentine-enamel junction.





Caries susceptibility of tooth enamel.

Caries susceptibility, or tooth surface resistance, depends on the following factors:

1. The anatomic surface of the tooth: natural fissures and spaces between teeth provide favorable conditions for long-term plaque retention.
2. The saturation of tooth enamel with fluoride: the resulting fluorapatite is more resistant to acids.
3. oral hygiene: the timely removal of plaque prevents further decay.
4. Dietary Factor: A soft, carbohydrate-rich diet promotes plaque build-up. The amount of vitamins and trace elements also affects the overall condition of the body and especially saliva.
5. Quality and quantity of saliva: Low levels of viscous saliva promote bacterial attachment to the pellicle and plaque formation (see Tooth Plaque). The buffering properties of saliva to maintain a normal pH, and the amount of immunoglobulins and other protective factors in saliva have a very important influence on enamel caries resistance.

6. Genetic factor.
7. General condition of the body.

Personal hygiene.

Because the natural environment of the mouth is alkaline, dental enamel also needs to maintain an alkaline balance. An alkaline environment is compromised after each meal when carbohydrates are broken down by a variety of acid-producing bacteria which process leftovers. The acid corrodes the enamel and causes tooth decay, which can lead to irreversible damage requiring fillings.

In order to prevent caries it is necessary to rinse your mouth after each meal with water or, even better, with a special mouthwash, brush your teeth or at least chew gum without sugar.

Dentin

Structure of the tooth

Dentin (dentinum, LNH; Latin dens, dentis - tooth) is the hard tissue of the tooth that makes up its main part. The crown part is covered with enamel, the root part of the dentin is covered with cement. It consists mainly of hydroxyapatite (70 % by weight), organic material (20 %) and water (10 %)[1], permeated by dentinal tubules and collagen fibers.

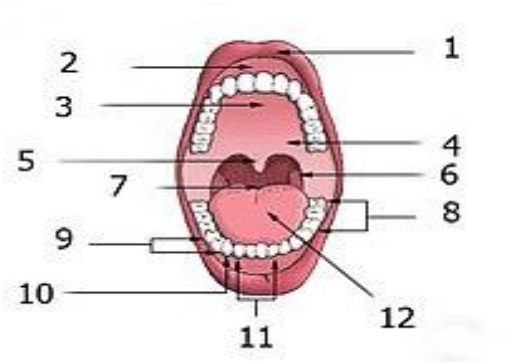
It serves as the base of the tooth and supports dental enamel. The dentin layer is 2 to 6 mm thick. The hardness of dentin reaches 58.9 kgf/mm².

A distinction is made between pericarp (inner) and capillary (outer) dentin. Collagen fibers are predominantly located tangentially in the peri-pulpal dentin and are called Ebner fibers. In capillary dentin, collagen fibers are arranged radially and are called Korff fibers.

Dentin is divided into primary, secondary (replacement) and tertiary (irregular) dentin. Primary dentin is formed during the development of the tooth, before it erupts (the first tissue that forms during histogenesis)[2]. Secondary (replacement) dentin is formed throughout a person's life. It differs from primary dentin in its slower rate of development, less systematic arrangement of dentinal tubes, more

erythroglobular spaces, more organic substances, higher permeability and lower mineralization. Tertiary dentin (irregular) is formed by dental trauma, tooth preparation, carious and other pathological processes, as a response to external irritation.

Mouth cavity



Oral cavity:
1. Upper lip (lat. Labium superius)
2. Gingiva (lat. Gingiva)
Hard palate (lat. Palatum durum)
4. Soft palate (lat. Palatum molle)
5. Uvula (lat. Uvula palatina)
6. The palatine tonsil (lat. Tonsilla palatina)
7. Isthmus pharynx (lat. Isthmus faucium)
8. Large molar teeth (lat. Dentates molares)
9. Small molars (lat. Dentates premolares)
10. Fang(s) (lat. Dentes canini)
11. Incisors (lat. Dentes incisivi)
12. Tongue (lat. Lingua)

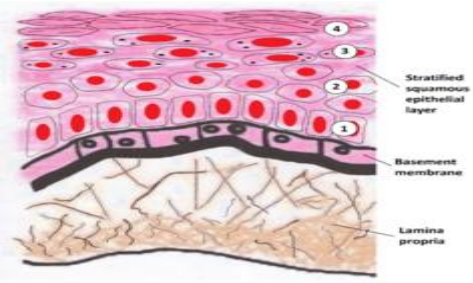
Mouth cavity (lat. cavum oris) is the initial part of the anterior part of the human digestive system (for the animal oral system, see the article Mouth). The mouth is used for ingestion and primary processing of food (including the mechanical grinding through chewing and the initial stage of digestion during which the polysaccharides in the food are broken down by amylase and maltase in saliva). This produces a food lump that enters the esophagus through the pharynx.
The oral cavity is also involved in the processes of breathing and speech communication.

Anatomical Structure

The oral cavity is divided into two divisions: the vestibulum (lat. vestibulum oris) and the oral cavity proper (lat. cavum oris proprium)[1].
The vestibulum is bounded on the outside by the inner surfaces of the lips and cheeks, and on the inside by the outer surfaces of the teeth and gums. The vestibule of the mouth (and with it the entire oral cavity) communicates with the external environment through the oral cavity (lat. rima oris). The vestibule communicates with the oral cavity through the gaps between the teeth and the gap between the last molar and the mandibular branch. It is into the vestibule of the mouth (usually

at the level of the second upper molar) that the discharge ducts of the parotid salivary glands (right and left) open.
The inside of the mouth is limited by the hard and soft palate (forms the roof of the mouth), the teeth and gums on the front and sides, and the diaphragm (floor) of the mouth on the bottom.

The mucous membrane



Structure of the keratinized mucosa of the oral cavity (from bottom to top): muscular plate, basal membrane of epithelium, 4 layers of epithelium

The mucous membrane of the oral cavity (lat. tunica mucosa oris) protects the underlying tissues both from mechanical damage and from the penetration of microorganisms and toxic substances into them. Characteristic features of the mucous membrane of oral cavity: the presence on the majority of its sections of multilayered flat neohoring epithelium with thickness of 180-600 microns, absence (or weak development) of muscular plate (lat. lamina muscularis), as well as absence of submucosa in some areas; in such cases mucosa lies directly on bone (in the gums and hard palate) or on muscles (in the tongue and soft palate) and is firmly fused with underlying tissues. The pink color of the mucosa is due to the presence of a large number of capillaries, which are translucent through the epithelium.
Differences in the structure of the mucous membrane of the oral cavity in its different parts are caused primarily by adaptation to different mechanical requirements. On those areas (gums, hard palate: about 25% of the total surface of the oral mucosa), mechanical loads on which are significant (due to their active role in chewing), the epithelium is keratinized. Other areas (60% of the total surface), where tissues require more flexibility, are covered with non-keratinized epithelium. Finally, the back of the tongue (15% of the surface) is covered by specialized epithelium, which resembles a mosaic of keratinous and non-keratinous epithelium[2].
In all cases epithelium of oral mucosa contains four layers. In the case of the keratinous epithelium, these are: the basal layer (lat. stratum basale; number 1 in the figure to the left), the spiky layer (lat. stratum spinosum; number 2), the granular layer (lat. stratum granulosum; number 3), and the horny layer (lat. stratum corneum; number 4). In the case of non-keratinous epithelium, the intermediate layer (lat. stratum intermedium) is referred to instead of the granular layer, and the surface layer (lat. stratum superficiale) takes the place of the horny layer.

On the mucous membrane of the oral cavity (as well as the pharynx and epiglottis) there are taste buds - human organs of taste. The cells that make up the taste bud are modified epithelial cells; some of them, which lie on top of the bud, are taste receptors. Food particles dissolved in saliva come into contact with taste receptors, passing through small holes in the epithelium of the mucous membrane - taste pores.

Muscles

Several muscles are responsible for the movement of the lower jaw. The chewing muscles lift the lower jaw and bring it closer to the upper jaw, the masseter muscle itself, the temporalis muscle and the medial pterygoid muscle. The lateral pterygoid muscle is responsible for simultaneous contraction of the right and left side muscles to move the lower jaw forward and in unilateral contraction to move it in the opposite direction. The lowering of the lower jaw is ensured by the M. mandibularis, the M. mandibularis and the anterior belly of the biceps muscle.

In the thickness of the lips lie the tufts of fibers of the circular muscle of the mouth (lat. musculus orbicularis oris), which is responsible for closing the mouth and pushing the lips forward. In the walls of the cheeks are the cheek muscles, which are responsible for pulling the corners of the mouth apart and pressing the cheeks against the teeth.

Several muscles are present in the soft palate at once; they raise, lower and tense the palatine curtain transversely, as well as raise and shorten the uvula. Likewise, the tongue has several muscles; they are collectively responsible for its various movements during chewing, swallowing, and speech articulation[13].

The chewing apparatus

Mechanical processing of food in the oral cavity is provided by the act of chewing, which is based on periodic movements of the lower jaw relative to the upper jaw. The chewing apparatus, consisting of the jaws with their rows of teeth and the muscles that set the lower jaw in motion, is responsible for the chewing process. The tongue is also actively involved in this process.

During chewing, food is crushed and mixed with saliva, resulting in a food clump that is then passed down the throat into the esophagus. Coordination of the muscles during chewing is provided by the chewing center, the main part of which is localized in the medulla oblongata.

In addition to chewing, the chewing apparatus performs a number of other functions: gripping and holding food, guiding the food ball into the pharynx and esophagus, articulating speech sounds, participating in breathing and producing mimic movements; thus, it is a polymodal biomechanical system[16].

Speech apparatus

In the oral cavity is located most of the constituent part of the human speech apparatus pronouncing organs - organs that directly participate in the formation of speech sounds, creating a variety of obstacles to the stream of exhaled air and providing due to this phonologically significant differences between the articulated sounds. These organs include: lips, teeth, alveoli, tongue, hard palate, soft palate (palatine curtain), uvula (only the vocal cords lie outside the oral cavity - in the

larynx). Most of these organs are active organs of speech (they perform the movements necessary for the formation of the sound of speech) and the teeth, alveoli and hard palate are passive organs of speech (they remain immobile, serving only as a "support" for the corresponding active organ). The oral cavity itself plays (along with the nasal cavity and pharyngeal cavity) the role of a resonator, which during the speech process changes its volume and shape, affecting the timbre of articulated sounds.

Microflora

The composition of the normal microflora of the human oral cavity is dominated by bacteria, while viruses, protozoa and microscopic fungi are represented by a much smaller number of species. The overwhelming number of microorganisms present in the oral cavity do no visible harm to the host, being commensals. Among the bacteria of the mouth dominate streptococci (from 30 to 60% of the entire microflora, in 1 ml of saliva detected up to 100 or more streptococci), and lactobacilli, acting for many of its inhabitants non-permanent antagonists. However, under various violations of the physiological state of the oral cavity representatives of non-permanent flora, including pathogenic species, may be retained and multiply there, which may lead to the occurrence of various diseases. In 40-50% of cases in the mouth of healthy people there are fungi of the genus Candida (mainly C. albicans), which usually do not cause any harm, but with increased reproduction (for example, with uncontrolled use of antibiotics) can cause candidiasis or dysbacteriosis. There are also protozoa in the oral microflora: representatives of the genera Entamoeba, Trichomonas, etc.

18 - Text PRINCIPLES OF CLASSIFICATION OF COMPOSITE MATERIALS

The systematization of composite materials is a difficult task because their assortment is very wide and is constantly being updated. The main classification principles are given below:

By chemical composition:

1. traditional composite materials.
2. ormoceramics (organically modified ceramics).

By consistency:

1. Low-density composite materials (liquid, fluid).
2. Medium density composite materials.
3. High-density composite materials (packable).

According to the type of filler:

1. Macrophilic composite materials.
2. Microphilic composite materials.
3. Hybrid composite materials.
4. Nanocomposite materials.
5. Hyomers.
6. Keromers.

According to the indications for use:

1. Universal composite materials.

2. Composite materials for anterior tooth restoration. 3. Composite materials for restorations of posterior teeth.
According to the method of polymerization:
1. Light-cured composites.
2. chemically cured composites.
By form of release:
1. Paste-paste in individual jars (chemocomposites).
2. Paste or gel in syringes.
3. Paste or gel in capsules.

INDICATIONS AND CONTRAINDICATIONS FOR THE USE OF COMPOSITE MATERIALS

Clinical indications:
1. Direct restorations of small, medium and large Black Class I-VI carious cavities in permanent teeth.
2. Direct restorations of various defects of non-carious genesis.
The following are the most common types of dental restorations. 3.
4. Direct restoration in the oral cavity of old fillings made of composite, amalgam, ceramic, metal-ceramic, metal-acrylic, plastic crowns. 5.
5. Correction or modification of shape, color, and size of teeth.
6. Indirect fabrication of inlays, veneers with light box polymerization.
7. Teeth splinting in combination with reinforcing tapes.
Clinical contraindications:
1. Allergy to any of the components of the composite material in the dentist or patient.
2. Inability to isolate the working field from saliva.
3. Poor oral hygiene of the patient.
4. Bruxism.

PROPERTIES OF COMPOSITE MATERIALS

The choice of one or another material is determined by a set of characteristics that depend on the combination of the main components. It is impossible to change the parameters laid down by the manufacturer, but knowing them
allows you to choose the most suitable material in a specific clinical situation.

The main physical properties of composite materials
are compressive and tensile strength, wear resistance, optical effects (opacity, transparency, fluorescence, opalescence), radiopacity, polymerization shrinkage, density and thixotropy, coefficient of thermal expansion, elastic modulus.
The ability of the material to withstand vertical and horizontal
loads is measured in MPa or kg/cm2. The compressive strength varies
220 MPa for flowable composites to 450 MPa for packable composites.
Polymerization shrinkage is one of the most important in clinical practice
properties. The minimum possible shrinkage today
is 1.6 % and the maximum shrinkage is 5.5 %. Most materials have a shrinkage in the range 2-3%. The shrinkage of a material
Most materials have a shrinkage rate of 2-3 %, depending primarily on their fill level.

pourable materials have the highest average shrinkage of 3.5-5% and the highest average shrinkage of packed composites and shellacs is 1.7-2%. The presence of a certain shrinkage dictates the necessity of layer-by-layer application of composite materials.
The modulus of elasticity is a physical value that characterizes the stiffness of the material and is measured in GPa. The higher the modulus, the stiffer or less elastic the material is.
the stiffer or less elastic the material is. All composite
materials have a higher modulus of elasticity than dental hard tissue.
tooth hard tissue. Fluid materials and microfill composites have the lowest modulus of elasticity, so although shrinkage in these materials is high, it is softer than in hybrid composites. That is why
Fluid and microfill composites are recommended for Class V cavity restorations.
The radiopacity of a material depends on the type and amount of the filler. It is measured as a percentage of the contrast of
of a 1 mm thick aluminum taken as a reference. The radiopacity
of enamel is equivalent to 230% of the standard and dentin to 150%. The values for this
The range is from 130% for flowable composites to 350% for dentin shades of nanocomposites [7]. The higher the radiopacity of the material, the easier it is to visualize in the radiographs, which allows for the assessment of
the quality of the restorations and allows for dynamic monitoring.
The main chemical properties include the type of organic
matrix, resistance to light, type of filler and filling material by weight and volume, speed and depth of polymerization.
11
The combination of methacrylates that make up the organic matrix
affects parameters such as durability, color stability, and strength of the restoration.
The minimum fill level for flowable materials is
55-70% by weight and 30-40% by volume. Other materials have a fill rate of 70-88% by weight and 45-69% by volume. Packable composites and nanocomposites contain the greatest amount of filler.
The biological properties of the composite materials are characterized primarily by the amount of residual monomer, the threshold
level of which is regulated by ISO standard [12]. As of today
There is no material that is 100% polymerized and does not contain
residual monomer. The tolerance (toxicity) of the material in relation to the SOPR and dental pulp depends on both the quality of the material, and the conditions, timing of storage and correct polymerization in the
clinic. Chemo-cured materials have a higher amount of residual monomer than light-cured materials. Ormocers have the lowest level of residual monomer release. All modern composite materials are non-toxic after adequate polymerization.
The performance of any restorative material consists of

of such parameters as convenience and speed in work, durability, versatility, economy and aesthetics. A wide range of composite materials meets the demands of the most demanding dentist.

Ease of use depends on a number of factors (material prepackaging, material consistency) and is characterized by the fact that the material is easy to introduce to the carious cavity, distribute and model. The working time of chemo-curing materials is limited, usually 2-3 minutes. Light-curing materials, applied in layers, have a wider range of modeling options. However, keep in mind that working time with each layer of photocuring material may be limited by the sensitivity to natural light or the reflector light on the dental unit.

The working time under such light for different materials varies from 35-200 s, more often about 2 min.

Speed in working with composite materials is an important factor and depends primarily on the maximum possible thickness of the layer and its polymerization time. The speed of work significantly

The speed of work increases significantly with those materials, in which a thicker layer cures in less time. For flowable materials the maximum layer thickness layer thickness is 1 mm, for packable composites - up to 5 mm, and for all others the layer thickness of 1.5-2 mm is recommended. The time of light polymerization depends on a huge number of parameters: the type and power of the light source, depth and access to the carious cavity, etc. Most existing materials have a polymerization time of 10-20 s for enamel and 30-40 s for dentin shades.

The strength of materials plays a major role in the restoration of medium to large Black Class I, II and IV dental hard tissue defects.

In such cases, hybrid composites, hyomers, ceromers, and oromers may be used. In the case of high-load class I-II restorations

The best choices are packable composites and Ormocers. Flowable materials, microfibers, having much lower strength, are better suited for Class III, V or minimally invasive restorations.

Versatility is a comprehensive indicator of the ability to apply the material in a variety of clinical situations. Hybrid composites and Ormocers are considered universal materials.

ERRORS AND COMPLICATIONS WHEN WORKING WITH COMPOSITE MATERIALS

Compared to other restorative materials, working with composites

Composites are a complex and time-consuming procedure, creating the conditions for the emergence of

This creates the conditions for the emergence of possible problems.

Most errors are due to faulty technique and can be made at any stage. The most common are incorrect color selection, inadequate isolation of the working field, poor adaptation of the material,

incomplete polymerization, and lack of a contact point. As a result of mistakes made, the strength, aesthetics, and
Durability of the filling is reduced, creating conditions for the development of complications in the
in the short and long term.
Immediate complications when using composite
The use of composite materials is quite rare and is mostly related to either the properties of the material itself (low-quality, poor-quality, poor-quality).
The material itself (poor-quality, outdated material), or due to patient characteristics (allergies to components), or due to gross violations of techniques (contamination of the working field, contact with
eugenol-containing materials). These manifest themselves as a local allergic reaction on the gingiva, mucosa and very rarely as a general allergic reaction (urticaria, etc.), toxic irritation
pulp, post-operative sensitivity, and loss of the filling.
Long-term complications are manifested by marginal abnormalities, discoloration, the development of secondary caries, loss of
filling, the death of the pulp.
Effective methods to prevent errors and complications are strict adherence to technique at all stages and continuous dynamic monitoring of restorations.

19 - Text

These are materials that are used by the dentist when it is clinically impractical or impossible to complete the treatment of caries and its complications in one session.
Temporary materials are also used to isolate medication pads left at the bottom of the cavity, in the pulp chamber or at the mouths of root canals. And also as a gasket for a permanent filling.
The requirements for temporary restorative materials are quite extensive, they must be plastic, easy to insert and remove from the carious cavity,
Do not inactivate drugs, be sufficiently strong and acyferrent to the dental pulp and SOPR, do not dissolve in oral fluid and provide a hermetic closure of the defect for the required period, but not less than 3 days. These requirements to some extent meet the materials used for temporary fillings.
Temporary restorative materials are mixed on the rough surface of the glass with a metal or plastic spatula. The materials are introduced into the cavity in one batch, smoothed with a cotton tampon, do not condense.
Artificial dentin (zinc-sulphate cement) is a white powder, consisting of 24 % zinc sulphate, 66 % zinc oxide, and 10 % kaolin. It is mixed with distilled water to the consistency of sour cream. When placing a temporary filling it is required to thoroughly dry the cavity, because in the presence of oral fluid the material does not harden. The life of this filling is 1-3 days.
2. Dentney paste. It consists of artificial dentin, aromatic substances and glycerin-vaseline base. The material has good adhesion, is able to harden in a humid environment, at oral temperature, for 8-10 hours. The service life of this filling is 7-10 days.

3. Vinoxol. It consists of a powder and a liquid, stored separately. The powder is white and contains 89% zinc oxide, 5% calcium sulfate, and 6% calcium carbonate. Liquid is polystyrene (5%) in guaiacol (95%). The material has good adhesion, does not irritate the pulp of the tooth. Has sufficient mechanical strength, which allows prolonging the life of the filling up to 6 months.
4. Zinc-eugenol cement (ZEC). It consists of zinc oxide and eugenol, stored separately. CEC is prepared prior to use and kneaded to a paste consistency on a rough glass surface. The material hardens in a humid environment at oral temperature for 8-12 hours. CEC is very popular in pediatric restorative dentistry, it is used as a therapeutic sealant in the treatment of deep cavities and pulpitis by the biological method, for root canal filling and temporary filling of teeth. This filling material has a mild sedative and analgesic effect, pronounced antiseptic and regenerative properties.
5. Polycarboxylate cement (PCC). It consists of a separately stored powder (zinc oxide) and a liquid (37% aqueous solution of polyacrylic acid). It is a modern restorative material that was invented as an alternative to phosphate cement PCC is able to provide a chemical bond with the tooth tissue, forming a strong bond between dissimilar surfaces. The material has high biocompatibility with the tooth tissues, it is impervious to acids and monomers released during the hardening of the filling. It is designed not only for the temporary filling of children's teeth, but also for root canal filling. Also PCC is used for fixation of orthopedic instruments and restorations of deciduous teeth. However, the low mechanical strength and poor chemical stability do not allow the use of PPC for the restoration of permanent teeth.
6. Simpat (manufacturer France) is well tolerated by the dental tissues; it quickly hardens in the cavity; it adheres to dentin; it provides a seal for the filling.
Simpat does not cause irritation. This paste can be used for deep carious cavities in children, it does not cause a reaction of the gingiva.Sympat is available in two types:
- pink color;
- white.
Simpatrost is applied over a cotton swab or directly into the tooth cavity.
Simpat white is more malleable than pink, it is designed for filling living teeth, it is usually applied on a tampon to prevent painful compression phenomena.

Insulating pads

This group of pads acts as a layer between the tooth substance and the restorative material, with the goal of protecting the tooth pulp from the toxic effects of the restorative material. All insulating pads must have a number of positive properties that meet the medical and technical requirements:
1. Do not irritate the pulp of the tooth.
2. be impervious to acids and monomers released during the curing of permanent fillings.
3. have low thermal conductivity.
4. Do not alter the geometry of a properly shaped cavity.
5. Have good adhesion.

6. Have a coefficient of expansion close to the hard tissues of the tooth.
7. Improve retention and marginal seating of the permanent filling.
8. Bear the static loading associated with redistribution of masticatory pressure.
9. Be radiopaque.
10. Do not change the color of the tooth.

Phosphate cement. It consists of separately stored powder and liquid, the powder is 90% zinc oxide, b% silicon oxide and 4% calcium oxide.

The liquid is a 35% aqueous solution of orthophosphoric acid, with zinc, aluminum and magnesium phosphates introduced to reduce the rate of chemical interaction between the liquid and the powder.

It is mixed on smooth surface of glass with metallic or plastic spatula, optimal ratio of powder to liquid is 4:1. Forming mass consistency is considered normal, if at a tear off a spatula from mass it does not pull behind it, and breaks, forming teeth of 1 mm in height.If the mass is received thick, then it is impossible to regulate its consistence, adding a liquid.Optimal time of setting the material is 4-8 minutes. Phosphate cement can also be used for filling milk teeth, fixation of orthopedic structures and filling root canals. The binding of the cement to the tooth tissues, metals and other restorative materials is due to the roughness of the surface.

Positive properties of phosphate cement

1) Does not irritate the pulp of the tooth, that is, the material is not chemically toxic. However, with deep caries can cause necrosis of the neurovascular bundle, so it is not recommended to use this material for the treatment of pulpitis by the biological method and deep caries without a therapeutic pad.
2) Has low thermal conductivity.
3) Impermeable to acids and ionomers released during hardening
permanent filling.
4) Does not change the geometry of a properly formed carious cavity
5) Radiopaque
6) Has a coefficient of thermal expansion, close to the hard tissues of the tooth.

Negative properties of phosphate cement:

1) The low mechanical strength of the material does not allow it to be used as a permanent restorative material for dental restorations.
2) Does not have anticaries and antiseptic action.
3) Dissolves when exposed to oral fluid.
4) Does not match the color of the dental hard tissues.

Phosphate cement with silver

Consists of separately stored powder and liquid. The powder consists of88.5% zinc oxide, 6% silicon oxide, 4.5% calcium oxide and 1.5% silver. The liquid is
37 % aqueous solution of orthophosphoric acid with zinc, aluminum and silicon phosphates introduced to reduce the rate of chemical interaction between the liquid and the powder.

Silver has a pronounced bactericidal effect, which greatly enriches the positive properties of the phosphate cement. However, this pad cannot be used in restorations of the frontal group of teeth, as it does not match the color of the

dental hard tissues, it shines through composite fillings, and silver stains the dental hard tissues with a gray color.

Vnsmuth Cement (Visfant)

Visfate Cement consists of separately stored powder and liquid. The powder contains 8% bismuth in the form of oxide in addition to zinc oxide, silicon oxide and calcium oxide. The liquid is a 37% aqueous solution of orthophosphoric acid.

Bismuth oxide allowed this filling material to acquire bactericidal and bacteriostatic properties, mechanical strength and chemical resistance compared with phosphate cement. However, it should be noted that this material cannot be used as an insulating sealant in the treatment of the frontal group of teeth, because bismuth can change the color of the dental hard tissue.

Polycarboxylic Cement (PCC)

This consists of a separately stored powder (zinc oxide) and a liquid (37% aqueous solution of polyacrylic acid). It is a modern filling material that was invented as an alternative to phosphate cement. PCC is able to provide a chemical bond with the tooth tissues, forming a strong bond between dissimilar surfaces. The material has high biocompatibility with the tooth tissues, it is impervious to acids and monomers released during the curing of permanent restorations. It is designed not only for temporary filling, root canal filling, but also for the insulating pad under the permanent filling. Also PCC is used for fixation of orthopedic structures and restoration of deciduous teeth. However, the low mechanical strength and poor chemical resistance do not allow the use of PPC for the restoration of permanent teeth.

Glass ionomer cements (GIC)

SICs have become very popular and widely supported by practitioners due to the clinical success associated with the prolonged release of fluoride that inhibits the development of dental caries. Chemical and light-cured SICs are widely used in practice. SIC consists of a powder (calcium-aluminum-glass with added fluorides) and a liquid (polyacrylic or padimalienic acid solution).

Contemporary dentistry uses SIC as insulating liners or for luting posts, orthopedic constructions, for filling milk teeth and, in extreme cases, permanent teeth, and for sealing fissures.

Filling materials in this group allow for ideal protection of the pulp and dental hard tissue from chemical and thermal stimuli. SIC bonds firmly to dentin and composite restoratives without pre-etching, have high biocompatibility with the dental hard tissue and pulp. The fluoride released from the glass ionomer mass dissociates into the dental tissue and thus increases the resistance of the tooth to demineralization. The bonding of the restorative material with the enamel and dentin occurs due to the negligible bonding of the carboxylate groups of the polymeric acid molecule with the calcium of the dental hard tissue. Today, SICs are replacing phosphate, silicone-phosphate and polycarboxylate cements.

The positive properties of SIC are:

1. High chemical adhesion to the tooth structure.
2. good biocompatibility with dental hard tissues, pulp and SOPR due to the complete absence of antigenic properties. 3.

3. the presence of anti-carious effect.
4. Low polymerization shrinkage.
5. The coefficient of thermal expansion of the restorative material is close to the coefficient of thermal expansion of the tooth tissues.

Negative properties:

1. Insufficient mechanical strength.
2. Satisfactory aesthetic and cosmetic properties, which does not allow to use SIC for filling cavities grades 2 and 4 BLECA.

Insulating varnishes.

These are thin-layer spacers (liners). The varnish consists of a filler (zinc oxide), a solvent (acetone or chloroform), a polymer resin (polyurethane) and a medication (sodium fluoride, calcium hydroxide). Isolating varnish is applied to the cavity with a brush, evenly distributed on the walls and the bottom, dried with a stream of air. It is recommended to apply 2-3 layers of varnish in series to avoid nicks and cracks in the lining. The main role of insulating varnish is to protect the pulp of the tooth from the toxic effects of the filling material.

The positive properties of varnishes are:

1) Stimulate odontoblast activity.
2) Have a pronounced bactericidal and bacteriostatic effect.
3) Possess high chemical resistance and moisture resistance.
4) Reduce marginal permeability.

Negative properties:

1) Insufficient thermal insulating effect, which prevents the application of insulating varnish to the bottom of a deep carious cavity.

20 - Text

Dental cements

Dental cements must be:

- be sufficiently resistant to the intraoral environment;
- provide a strong bond to the dental tissues through mechanical bonding
mechanical bonding and adhesion;
- have high tensile, shear and compression strength;
- have sufficient working and curing time to perform satisfactorily
sufficient curing time for satisfactory performance;
- must be biologically compatible with dental hard tissues;
- have a low toxicity to the dental pulp;
- have good radiopacity.

As a result of research over the past 10 years, four basic types of cements have been proposed, which are classified according to the type of binder in the matrix and has certain indications for use.

Classification of cements

I. Phosphate
1) zinc-phosphate
2) silicate
3) silicophosphate
II. Phenolate

1) zinc-eugenol
a) polymeric
b) containing EVA (orthoethoxybenzoic acid)
c) alumina
2) calcium salicylate hydroxide
III. Polycarboxylate
1) zinc-polycarboxylate
2) glass ionomer
IV. Acrylates
1) polymethylacrylate
2) dimethylacrylate
a) filled
b) unfilled
Phosphate based cements
1. Zinc-phosphate cements
Application.
Zinc-phosphate cements (ZPC) have a wide range of applications from cementation or fixation of orthopedic fixed alloy and porcelain structures and orthodontic devices to their use as liners to protect the pulp from the toxic effects of permanent fillings.
Composition and curing.
The powder consists of 75-90% zinc oxide with the addition of magnesium oxide, silicon oxide and aluminum oxide. The liquid is an aqueous solution of phosphoric acid, containing H3P04 from 45 to 64%. The liquid also contains 2-3% aluminum and 0-9% zinc. Aluminum is necessary for the reaction of cement formation, while zinc is a retarder of the reaction between the powder and the liquid, which provides sufficient time to work.
Some cements have a modified composition. They may contain silver ions, sodium fluoride, calcium hydroxide, copper oxide, etc. as additives. Curing of CFZ proceeds according to the scheme: zinc oxide + phosphoric acid amorphous zinc phosphate. The formed zinc phosphate binds together unreacted zinc oxide and other cement components. The structure of hardened cement contains particles of unreacted zinc oxide, surrounded by a phosphate matrix.
Application method and properties.
Precise dosage of components and observance of mixing times are required for sustained success. The plate must be thoroughly dried. The powder is added to the liquid in small portions to achieve the desired consistency. Cement should not be touched until the curing time is complete. The cloudy liquid should not be used. Increasing the powder+liquid ratio makes the mixture more viscous, shortens the setting time, increases the strength, reduces the solubility and the amount of free acid.
At room temperature, the working time for most cements of this group is 3-6 min. and the hardening time is 5-14 min. Shorter curing times may be obtained by using a refrigerated mixing plate.

Freshly mixed CPP has high acidity: pH after mixing is 1-2, after hardening for 1 hour pH does not exceed 4, after 24 hours it usually reaches 6-7.
Advantages of CFC:
- ease of use,
- sufficient strength,
- radiopacity
Disadvantages of CFC:
- poor adhesion,
- solubility in intraoral fluid,
- Lack of antibacterial effect,
- irritating effect on the dental pulp,
- unaesthetic.
Representatives of CFCs are such domestic materials as phosphate cement, visfate, uniface, phoscine, silver-containing cement, etc.
Silicate cements
Application.
Silicate cements (SC) are used mainly for stopping cavities of III and V classes.
Composition and properties.
In addition to zinc oxide CZ powder contains silicon oxide (up to 47 %) and aluminum oxide (up to 35 %). Due to the content of silicon and aluminum these cements win in aesthetics, because it is possible to pick up under the color of tooth enamel, but lose in strength in comparison with CFC. The SC liquid is an aqueous solution of phosphoric acid, which remains partially unbound when mixed with the powder. The toxic effect on the tooth pulp is due to the residual acid.
The mixing of SC is done on a glass plate in the same way as for CFC.
Advantages of SC:
- ease of use,
-aesthetic appearance,
- poor solubility in the oral fluid.
Disadvantages of SC:
-fragility,
- poor adhesion,
- irritating effect on the tooth pulp.
Domestic representatives of this group of cements are Silicin, Silicin-R, Alumodent. Silicin is available in 7 colors, and alumodent in 4 colors.
In pediatric dentistry silicate filling materials are used with limited restrictions, because they cause frequent complications from the pulp, and also have a high solubility in oral liquids.
Fillings made of silicate materials are short-lived, with an average life of 4 years. One of the primary reasons for the limited use of silicate cements is the low initial concentration of hydrogen acids (pH - acidic), which even one month after filling is still below average. It is well known that the acidic components of silicate easily penetrate through the dentin and can have a harmful effect on the vital activity of the pulp, and sometimes (if insufficiently isolated) cause pulp necrosis. In children's teeth (with morphologically immature structure), where the dentinal

tubules are wide and low-mineralized, the harmful effects of acidic components are even worse. Even with strict adherence to the rules of application of cushioning material, especially in teeth with incomplete formation of the root system, the possibility of toxic effects of silicate materials on the pulp of the tooth is not excluded.

When treating caries of temporary teeth in children silicate materials can be used only in the pulpy tooth.

The use of silicate materials is contraindicated for children who breathe by mouth (diseases of the nose, throat), children with sharply protruding upper incisors, dental and maxillofacial anomalies), in which permanent contact of fillings with air, followed by excessive drying of the material is possible.

When drying, silicate material undergoes changes that lead to sharp shrinkage and softening, i.e. to the violation of the physical and mechanical properties of the silicate fillings.

Nowadays, silicate materials are widely recommended for use in adolescents (12-15 years), because these materials have anti-carious effect due to the fluoride compounds that are part of the powder.

Due to the toxicity of silicate materials, special attention should be paid to the application of the spacer material.

3. Silicophosphate cements

Silicophosphate cements (SFC) have been around for many years as a combination of CFC and SC, i.e., they combine the esthetics of silicates with the strength of phosphates.

Application.

SFC are used for cementation of fixed dentures and orthodontic appliances, as well as for filling of carious cavities of III and V classes.

Composition and hardening.

The powder is a mixture of 10-20 % zinc oxide (KFC powder) and silicate glass (SC powder), mixed mechanically or melted and regrind. Silicate glass usually contains up to 25% fluoride. The liquid consists of a concentrated solution of orthophosphoric acid, containing 45% water and 2 to 5% aluminum and zinc salts.

Solidified cement consists of unreacted particles of glass and zinc oxide, bound together by a matrix of aluminosilicate phosphate gel.

Application method and properties.

The mixing process is similar to that for CFZ. The mixture for sealing should be glossy and have dough-like consistency. Working time of SFC is 4 minutes, curing time - 5-7 minutes, but it can be increased by using a cooled plate. Due to the presence of glass, these cements are more transparent than SFC, so they are more aesthetic and can be used for cementing porcelain structures. SFCs are highly acidic (pH 4-5) after setting. Therefore, the pulp must be protected when restorations are placed on living teeth with these cements, just as with SFC.

The advantages of SFC, depending on their properties, are:

- ease of application;
- relatively high strength and wear resistance;
- relatively good adhesion to the tooth tissues;

- poor oral fluid solubility;
- aesthetics.

Disadvantages of SFC:

- irritating effect on the tooth pulp.

Typical representatives of this group of cements are Silidont-2 and Silidont-P.

21 - Text

Physical treatments in dentistry are used for many diseases for preventive and curative purposes. Dental disease is not a local process, the whole body suffers.

Physical methods of treatment, in addition to providing local action on the pathological process, are accompanied by the restoration of the normal course of the physiological process and contribute to the removal or reduction of pain, improve tissue nutrition, resorption of inflammation, normalization of metabolic processes, a better course of healing wounds of the oral mucosa and significantly accelerate the healing process.

In our clinic physiotherapeutic treatment is carried out with the following methods:

- UHF;
- UHF;
- Electrophoresis (of the teeth and gums);
- tube-quartz;
- laser therapy (apparatus "OPTODAN");
- Ultrasonic therapy (apparatus "UZT-1.02").

Treatment of children under 17 years old is free of charge.

Laser therapy

Optodan" apparatus. It is used for prevention and treatment of:

- dental caries: medium, deep, demineralization and chalk spot stages;
- Dental pulpitis and periodontitis;
- Diseases of the paradontium and the oral mucosa;
- alveolitis;
- periostitis;
- to accelerate the eruption of retained teeth;
- To reduce pain during tooth repositioning and accelerate orthodontic treatment.

2. Ultrasound therapy

Apparatus UZT -1.02.C. Used for the treatment of:

- periodontosis;
- glossalgia;
- arthritis of the temporomandibular joints;
- Anomalies of teeth position in orthodontics. 3.

3. apparatus for galvanization of oral cavity GR-2

It is used for the treatment of:

- chronic periodontitis;
- enamel hypoplasia;
- fractures of the jaws;
- Fluorosis. 4.

4. apparatus "Beam-2" (electromagnetic)
It is used for treatment of:
- periostitis;
- alveolitis;
- arthritis of temporomandibular joints;
- parotitis.
5. Apparatus UHF-80 (ultrahigh-frequency)
Used for treatment of:
- conditions after tooth extraction;
- alveolitis;
- periostitis;
- arthritis of the temporomandibular joints;
- lymphadenitis.
6. Ultraviolet irradiator UGN-1
Used for the treatment of:
- aphthous stomatitis;
- periodontitis;
- Chronic periodontitis.
Procedures are performed only by referral of a dentist.

The main criterion for the quality of a student's preparation is his rating, which is composed of the current assessment, assessment of interim control and assessment of the final control.
The 100 points for the discipline as a whole are distributed as follows:
Points are distributed by semester depending on the duration of the subject.

The criterion for evaluating practical classes is a current assessment, consisting of the control of the student's preparation for the class and assessment of the quality of the task.
Evaluation criteria for TC
Evaluation criteria of the CDS
Evaluation criteria PC
Evaluation criteria for IC
Evaluation criteria of practical skills

Information and methodical support

Topic: #1. Specific treatments for children with epilepsy.

Children with epilepsy often suffer tooth erasure (due to seizures) and have dental trauma (as a result of falls). Therefore, the need for dental restoration is the most common reason to see a pediatric dentist.
Before the treatment, the doctor will certainly find out in detail what can cause a child to have an attack. And will offer treatment options that take into account all the risk factors.

What anti-stress treatments do we use?
Methods of anesthesia: either local anesthesia, or in sleep (anesthesia) - the anesthesiologist-anesthesiologist will help make the right decision.
Dental treatment for children with epilepsy in anesthesia is possible if the little patient is on medication therapy and it is effective.

Topic: #2. Carrying out preventive measures in children with disabilities.

The peculiarity of dental care for children with disabilities is that they require special preparation before treatment. In addition, giving all their strength to fight the child's main disease, parents often delay going to the pediatric dentist, which results in the development of multiple complicated caries, a disease that requires complex treatment. Some pediatric dentists are unable to provide full dental care because their workplaces are not properly equipped. For example, to treat children with intellectual disabilities, in most cases it is only possible to provide skilled dental care under general anesthesia.

Topic: #3. The effect of changes in dental rudiments during pregnancy.

Although pregnancy is an excellent time when expectant mothers are waiting for the miracle, it is also a great strain on the body.
Calcium metabolism inevitably changes during pregnancy. Mommy's reserves go to build the baby's bone tissue. Deficiency of this trace element in the body of a pregnant woman is almost common. And if a woman also suffers from toxemia, the normal level of calcium in general can be forgotten: not only that with food in this case it is almost impossible to get, so often with toxemia washed out of the body and that was. In this case, the body of the pregnant woman begins to look for it in other places. And the first to suffer are the teeth. Indeed, after pregnancy, many women have serious problems with their teeth.
Also during pregnancy, there is a hormonal change in the body, which worsens blood supply and weakens the immune system. Pregnant women's saliva has a lower concentration of calcium and phosphorus, which makes tooth enamel more vulnerable and accessible to the development of cavities. Increased appetite during pregnancy leads to increased consumption of carbohydrates, which are a favorable environment for the development of bacteria.

Topic: #4. The structure of the cardiovascular system the importance of the child's oral cavity.

The structure of the mucous membrane of the oral cavity in the norm. The oral cavity is divided into 2 sections. The outer section, called the vestibule of the mouth, is limited to the cheeks and lips, and is separated from the oral cavity by the alveolar appendages with teeth and gums. The oral mucosa (MIO) is subject to frequent mechanical trauma from solid foods, temperature effects, biting, exposure to microorganisms, etc. As a consequence, one of the main functions of the oral mucosa is protective. It is provided to a large extent due to the constant renewal of multi-layer epithelium, its high ability to regenerate. The surface of the mucous membrane is moistened by saliva, which is produced by salivary glands. Saliva moistens and softens food, to a certain extent preventing mechanical damage to the mucosa. In addition, saliva contains antimicrobial substances, antibodies, nerve

growth factors, epidermal growth factor, etc. The mucous membrane is involved in the body's immune reactions.

Topic: #5. The importance of the respiratory system in the child's mouth.

The oral area has a close anatomical-physiological and functional relationship with the respiratory organs. In the oral cavity air is purified, warmed, humidified and decontaminated. Thus, the oral mucosa performs the initial stage of the respiratory function. Irritation of oral mucosa is accompanied by a number of reactions from the respiratory tract: intensification of lung ventilation, breathing rate, cough reflex, respiratory arrest.

There is also etiological and pathogenetic connection between chronic asepiphilic respiratory diseases and oral diseases. Chronic foci of infection in the mouth can provoke the emergence and worsen the course of a number of diseases of internal organs, including diseases of the bronchopulmonary apparatus. In addition, with respiratory system pathology the mucous membrane of the oral cavity reacts with the appearance of various kinds of disorders, and first of all trophic disorder. Especially clearly impaired trophism of oral mucosa is observed in children with acute pneumonia. Under conditions of disturbed metabolism there is overstrain of the nervous apparatus of the mucous membrane, which leads to consecutive functional exhaustion, dystrophy, necrobiosis and necrosis. Occurred structural disturbance of nervous structures inevitably leads to partial or complete denervation of separate areas of oral mucosa, which is further accompanied by disturbance of tissue trophism and development of inflammatory ulcerative neurodystrophic processes in them.

Topic: #6. The importance of the child's oral cavity in the work of the gastrointestinal tract.

The mouth is the bodily orifice in animals and humans through which food is taken and respiration is carried out. The mouth is where the teeth and tongue are located. Externally, the mouth can have different shapes. In humans, it is framed by the lips. The mouth is where food is mechanically ground and processed by salivary gland enzymes.

The average length of the alimentary canal of an adult male is 5 meters; it is divided into the following sections:

- The mouth, or oral cavity with teeth, tongue, and salivary glands.
- The pharynx.
- Esophagus.
- Stomach.
- The small intestine, including the subunits:

o duodenum,
o jejunum,
o ileum;

- Large intestine, including its subunits:

o cecum with its wormy appendix,
o colon with its sub-sections:
The ascending colon,

o Transverse colon,
the descending colon,
sigmoid colon,
o rectum with its broad part, the ampulla of the rectum, and the distal, lower part, the anus with the anal opening.

Topic: #7. The importance of the child's oral cavity in the endocrine structure.

Oral mucosa in diseases of the endocrine system. According to different authors, the frequency of SOPR lesions in endocrine disorders ranges from 2 to 80%. Diabetes mellitus (DM) is one of the most common endocrine pathologies in children. There is a tendency to "pomotivation" of diabetes. Its development most often occurs in 3 - 6 and 11 - 12 years. DM in children is usually severe, with mild forms and remissions being rare. Most characteristic of diabetes lesions of small vessels: arterioles, venules, capillaries (microangiopathies). Microcirculatory damage in diabetes leads to complications that can lead a child to disability at any age. Marginal periodontal disease in patients with diabetes is considered a local manifestation of diabetes-specific microangiopathy, causing dystrophic changes in periodontal tissues. Periodontal diseases in children with severe diabetes occur in 85% of cases. Their structure is represented by inflammatory processes: chronic gingivitis and chronic periodontitis of varying severity.

Topic: #8. The structure of the immune system in children The importance of the child's oral cavity.

The immune system includes organs and tissues in which the maturation (differentiation) of T- and B-lymphocytes occurs. Primary and secondary organs of the immune system are distinguished.

I. Primary organs of the immune system
1. thymus
2. Bone marrow
3. Squamous (multi-layered squamous) epithelia of covering tissues.

II. Secondary organs of the immune system
1. lymph nodes
2. white pulp of spleen
3. MALT structures
4. SALT structures
5. Facultative lymphoid structures.

MALT structures
1. Waldeyer-Pyrogov ring tonsils
2. The worm-like appendix of the cecum
3. Peyer's plaques
4. Solitary follicles.

The first stage of lymphocyte differentiation takes place in the primary (central) organs, before their interaction with antigen (antigen-independent differentiation stage). T-lymphocytes mature in the thymus (after the thymus involution its role is taken by multilayer squamous epithelium), B-lymphocytes - in red bone marrow.

Secondary (peripheral) organs provide subsequent maturation of T- and B-lymphocytes after their interaction with antigens (antigen-dependent differentiation

stage). Both T- and B-lymphocytes differentiate in the lymph nodes and in the lymphoid tissue of the spleen. In MALT structures and facultative lymphoid masses mainly B-lymphocytes mature, in SALT structures mainly T-lymphocytes mature.

Topic: #9. A visit to the dentist and a dental examination of the child with the parents.

Adaptation of the child is the key to quality treatment. If the little patient sits in the chair himself, he is comfortable and allows the doctor to perform all the necessary manipulations, then the treatment will be at the highest level and the risk of complications will be minimal.

In many cases, the right attitude of the child helps to avoid dental treatment under anesthesia (while sleeping). Local anesthesia, sometimes in combination with sedation (nitrous oxide) will be sufficient.

A child for whom an approach is found gets rid of fear of the dentist for life. This means that in adulthood he or she will go to the doctor on time and tolerate dental treatment easily.

Topic: #10. Examination of oral organs and tissues in children.

Methods of examining a dental patient. Getting acquainted with the child and parents, collecting complaints and anamnesis can be performed outside the dentist's chair. The clinical examination of the patient is aimed at making a diagnosis. It consists of identifying the patient's complaints, medical history, assessment of local status, and general symptoms. Interrogation or anamnesis, should be conducted taking into account the age of the child, many questions we do not address the children themselves, and their parents, regardless of the age of the child. Talking to the child should be done in an atmosphere that encourages him or her to talk frankly about everything that is bothering him or her. Gathering a medical history it is necessary to find out: when the first signs of illness appeared, whether you went to the doctor or did something at home, what tests were conducted, what treatment was prescribed, its effectiveness, respectively. Then begin with the identification of complaints at the time of treatment. In this case, find out the nature, duration, intensity of pain, the duration and cause of their occurrence. It must be remembered that small children are not able to express their feelings accurately, and parents are not always aware of what happened to their child during the day at the day care center, at their grandmother's or babysitter's. Preschoolers and schoolchildren may make up complaints or, on the contrary, hide them out of fear of the upcoming treatment. Therefore, the pediatric dentist often has to rely more on objective examination data than on information from children and their relatives. The medical history is the basic information about the child's life that is established by interviewing the child and his or her parents. Case histories help identify risk factors and causative factors for dental problems. The medical history may be aggravated or unaggravated. The anamnesis is considered aggravated when the factors that caused or contributed to the disease have been identified, genetic predisposition to the disease has been identified, other diseases

of the child have been identified, nutritional and living conditions of the child have been violated, etc.

Topic: #11. Determination of cariesogenic properties of dental caries.

Oral microbiology is one of the sections of medical microbiology. The subject of its study is the microbial flora adapted to the human body, its interaction with the body under physiological conditions, its role in autoinfectious and pathological processes. These processes differ from traditional infections in the fact that they are non-contagious, have no specific pathogen and are caused, as a rule, by the action not of individual microbial species, but of microbial associations. Oral microflora (syn. oral microbiocenosis) - a set of representatives of different taxonomic groups of microorganisms that inhabit the oral cavity as a kind of ecological niche of the human body, entering into biochemical, immunological and other interactions with the macroorganism and with each other. The constant microflora of the human mouth was formed as a result of

Topic: #12. Determination of saliva composition in children and its importance.

Saliva has a great influence on the maintenance of oral homeostasis. In the modern medical literature, there are many papers devoted to methods of diagnosing common diseases by analyzing the mineral composition and properties of saliva. Some indicators of saliva are sensitive indicators of serious systemic diseases and conditions of the body.

Saliva is a complex biological fluid, which is a complex secretion of large and small salivary glands. As a physiological "external" environment for the teeth and oral mucosa, saliva provides lubrication of oral organs and tissues, moistens dry food, participates in the digestive process, carries out trophic and protective functions [44]. This small volume secret plays a vital role in maintaining the normal functioning of all oral organs and tissues.

Topic: #13. To study the electrical conductivity of teeth in children and adolescents.

Patients of teenage dentists are the owners of the so-called changeable bite, that is, those children whose baby teeth have begun to change into permanent, or radical teeth. The essence of teenage dentistry is the treatment of permanent, on the one hand, and on the other hand, even children's teeth, which have some differences in structure from adult teeth. Firstly, the roots of permanent teeth in children are not fully formed, and the apical openings (the apexes of the tooth canals) are enlarged. Secondly, these teeth have a very wide and massive crown pulp, the horns of which are close to the hard tissues of the tooth - dentin and enamel.

Topic: #14. To study oral microflora in children.

Oral microbiology is one of the sections of medical microbiology. The subject of its study is the microbial flora adapted to the human body, its interaction with the body under physiological conditions, its role in autoinfectious and pathological processes. These processes differ from traditional infections in the fact that they are non-contagious, have no specific pathogen and are caused, as a rule, by the action not of individual microbial species, but of microbial associations. Oral microflora (syn. oral microbiocenosis) - a set of representatives of different

taxonomic groups of microorganisms that inhabit the oral cavity as a kind of ecological niche of the human body, entering into biochemical, immunological and other interactions with the macroorganism and with each other. The permanent microflora of the human mouth was formed as a result of

Topic: #15. Emotional accompaniment of the process of dental treatment in children.

To study features of parents' emotional response to the stress caused by hospitalization and surgery performed on a child, in order to identify risk factors for the loss of personal potential of family members. Participants and research methods. A total of 82 parents (15 fathers and 67 mothers) and 76 pre-school, primary school, and adolescent children participated in the empirical study. A package of methods consisting of an analysis of medical records, observation, a structured interview, a questionnaire to determine neuropsychological tension, the "incomplete sentences" technique, systematization of the results, and mathematical data processing methods was formed. A theoretical analysis of the problem of parents' emotional reaction to stressful situations related to the presence of congenital malformations in a child and the need for surgical intervention was performed. Results. It is shown that each member of the family, which is a unified system, is subjected to stress. Parents' reaction to the surgery performed on their child is determined by their personal peculiarities, the system of beliefs and attitudes in life. Conclusions. The emotional state of the parents influences the psychological state of the child and the efficacy of the treatment. Psychological support of the family at pre-operative and postoperative stages allows reducing the level of emotional discomfort of the child and parents.

Topic: #16. Study of the psychophysiological status in children when visiting the dentist.

In psychology - child and pedagogical, one of the central places is occupied by the problem of psychological features of younger schoolchildren. Knowledge and consideration of the psychological features of elementary school children will allow the correct organization of educational work in the classroom. Therefore everyone should know these features and take them into account in their work and when communicating with elementary school children.

Junior school age is the age of 6-11 year old children studying in grades 1-4 of elementary school. Boundaries of age and its psychological characteristics are defined by the system of education accepted for the given time interval, the theory of mental development, psychological age periodization (D.B. Elkonin, L.S. Vygotsky).

Currently there is no unified theory capable of providing a complete picture of the mental development of the child during different periods. Therefore, in order to get a complete picture of the development, behavior and upbringing of children, several theories that address the periodization of the elementary school age were analyzed.

Topic: #17. The use of translucent fillings in children.

A sharp increase in the number of dental diseases in children (therapeutic and surgical) and the number of dentoalveolar anomalies in childhood, adolescence and adolescence necessitates a search for modern methods of treatment, as well as their reliable prevention. In Russia, more than 80% of children and adolescents need oral health care. More than 60% of children, 30% of adolescents and 30% of adults need orthodontic care. Laser therapy is one of the methods that can improve the effectiveness of treatment of dental diseases and dental anomalies and reduce their duration. Research in the field of laser application in dentistry began in 1964 (Central Research Institute of Dentistry, prof. A.A. Prokhonchukov with a group of associates). "The therapeutic effect of laser light consists of its combined biological effect at all levels: subcellular, cellular, tissue, systemic and at the integral level of the whole organism. At the systemic level laser light has the most pronounced and effective effect on neuroendocrine and immune systems, blood formation and circulation, metabolism, trophism and regeneration.

Topic: #18. The use of automated and needle-free syringes in pediatric dentistry.

Injection injection of anesthetics has a number of disadvantages: painfulness at the time of anesthesia, the possibility of vascular trauma, needle breakage, transmission of infection through it. These disadvantages are absent in the needle-free method of injecting substances into body tissues.

The idea of a needle-free method of drug injection into the body appeared in 1866, when a Frenchman Beclard described an apparatus, which allowed injecting a substance into body tissues under high pressure (up to 300 atm) in a very thin stream. But only since 1947 thanks to R.A. Ningson's researches this method became of practical importance.

Subject: №19. Causes of oral halitosis in children.

Halitosis, or halitosis, is bad breath. It is not an independent disease, but only a symptom indicative of other pathologies. The underlying condition is not necessarily related to oral unhealthiness, but can be caused by various medical conditions that reproduce anaerobic microflora. The product of their activity is sulfurous volatile compounds, which have a characteristic unpleasant smell.

It should be remembered that masking the smell with mints or chewing gum is not the best solution. It is necessary to identify the exact causes in order to cope with the manifestation and not only eliminate the discomfort, but also prevent other complications of the disease.

CAUSES OF OCCURRENCE

Halitosis can be general or local. In the first case, it is associated with the dysfunction of internal organs, in the second - with the condition of the oral cavity. The main causes of local halitosis include:

- violation of oral hygiene rules, accumulation of bacterial plaque and the formation of hard dental deposits;
- single and multiple dental caries - superficial, medium, deep;
- Stomatitis, periodontitis and periodontal disease;
- Pulpitis, glossitis, cheilitis, gingivitis;
- Alveolitis, periimplantitis, pericoronitis, etc.

Topic: #20. Anomalies in the development of the rudiments of milk and permanent teeth in children.

Very rarely, but encountered is such an anomaly of the dental system as adentia, that is, the absence of milk teeth or even their rudiments. Adentia is determined not earlier than 12-15 months, by X-ray examination using an X-ray unit, and only after examination by a qualified dentist.

Our clinic has a more modern device, allowing adequate and high quality examination of the dentoalveolar system from any angle, completely safe for children: radiovisiograph.

Adentia is primary - when the rudiments of baby teeth are completely absent, and there is the absence of teeth in the oral cavity due to their retention in the jaw - retention. Teeth can be missing all (complete adentia) or only some (partial adentia). The absence of teeth is more often observed with permanent teeth - in adults, much less often with deciduous teeth.

The most common causes of adentia in children are health problems of the mother during pregnancy (genetic diseases, viral infections, poisoning, stress, etc.), smoking, treatment with strong medications, which prevent the formation of the tooth buds or their destruction at a later stage. With adentia, the jaws also develop poorly, the face becomes asymmetrical, and the bite becomes distorted. Partial adentia - the absence of individual teeth and the formation of large gaps between the available teeth - is more common during a deciduous bite. Treatment at an early age is aimed at the medical stimulation of the eruption of teeth and the development of the jaw. At older ages

removable dentures, which fill in the tooth row, can be made at an age. Non-removable dentures for children are not acceptable and are not recommended before the age of 21.

Independent work

Independent work No. 1

Specific treatments for children with epilepsy

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, booth and other views.

The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #2.

Carrying out preventive measures in children with disabilities

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work № 3.

The effect of changes in dental rudiments during pregnancy

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, booth and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #4.

The structure of the cardiovascular system the importance of the child's oral cavity

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work № 5

The importance of the respiratory system in the child's mouth

Independent forms to prepare for the work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referral, video, flash animation, stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #6.

The importance of the child's oral cavity in the gastrointestinal tract

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw,

Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #7

The importance of the child's oral cavity in the endocrine structure

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #8.

The structure of the immune system in children

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #9

A visit to the dentist and a dental examination of the child with the parents.

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, stand and other views.
The following sources are recommended for independent work: Internet resources, Dental Practice journal and other foreign journals, basic (1,2,3,4,5) and additional (1,2,3,4,12,14). , 17) Publications.

Independent work #10.

Examination of oral organs and tissues in children.

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, stand and other views.

The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work № 11

Determination of cariesogenic properties of dental caries.

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #12.

Determining the composition of saliva in children and its importance

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #13.

To study the electrical conductivity of teeth in children and adolescents

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, stand and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #14.

To study the microflora of the oral cavity in children.
Independent forms to prepare for the work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw,

Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referrer, video, flash animation, booth and other views.

The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work # 15.

Emotional accompaniment of the treatment process for children.

Independent forms to prepare for the work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
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Independent work #16.

The study of psychophysiological processes in children.

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, booth and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #17.

Application of folding filler with light in children

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, booth and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work № 18.

The use of automated and needle-free syringes

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.

The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #19.

Causes of halitosis of the oral cavity in children.

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referral, video, flash animation, booth and other views.
The following sources are recommended for independent work: online resources, Dental Practice magazine and other foreign journals, basic (1,2,3,4,5) and supplementary (1,2,3,4,12,14). , 17) Publications.

Independent work #20.

Causes of failure to develop rudiments of milk and permanent teeth in children

Independent forms to prepare for work: presentation (using MS PowerPoint, PromoSHOU, Impress, Kingsoft Presentation, ProShow Producer, SmartDraw, Prezi Classic Desktop, VideoScribe, Wink, SlideDog, Adobe Presenter, Hippani Animator), referer, video, flash animation, a stand and other views.
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GLOSSARY

ECD- Early childhood caries
Cerebral palsy - Infantile cerebral palsy.
AD- Down Syndrome
Antenatal- prenatal period.
Plaque- filling of teeth with food debris, pellicle
Halitosis- bad breath.
Vestibuloocclusion- a misalignment of the lower or upper dentition toward the cheek.
Hygiene-Hygiene (Greek hygienos - healing, bringing health) is a branch of medical science that studies the influence of environmental factors on a person and develops optimal requirements for the conditions of human activity.
SC- Silicate cement.
CC- Glass ionomer cement
Plaque - is a dense buildup of bacteria inside the matrix.
Tartar - causing plaque to calcify
Remineralization - enrichment of minerals
Caries prevalence - the ratio of the number of people who have at least one sign of tooth decay (decayed, filled, or extracted teeth) to the total number of people examined, expressed as a percentage
Remodent - made of bones and teeth of cattle, proposed by G.N. Pakhomov (1974) together with E.V. Borovsky.
Caries - a pathological process that appears after the eruption of teeth, in which there is demineralization and softening of the hard tissues of the tooth with the subsequent formation of a cavity.
Calcium Gluconate - used for remineralization.
Fluorosis - endemic disease due to fluoride intoxication resulting from drinking water with elevated fluoride content.
Postnatal - postnatal period
Prevention - Greek prophilactikos -prophylactic, in medicine, a set of measures aimed at preventing diseases and injuries, the elimination of risk factors for their development.
Pellicle - a soft dental plaque
Endogen - (endogenus; Greek endogens; endo - genesorogenic, arising) - arising, developing in the body of internal causes.
Exogen -- occurring or formed under the influence of external forces.
HE- Tooth enamel.

LITERATURE

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List of practical skills

1. individual hygienic measures are carried out?
2. dental examinations are performed with.
3. What is the shape of the teeth in the bite of deciduous teeth
4. Which baby tooth erupts first
5. At what age does the complete eruption of the baby teeth end?
6. How are the fourth and fifth baby teeth different from the fourth and fifth permanent

teeth?
7. By what substance of inflammation do the gums turn brown when Schiller-Pisarev solution staining them?
8. To which methods of examination does hygienic index determination refer?
9. The PMA index is used to determine
10. What does not stain on the PMA index
11.Where does palpation begin?
12. Percussion is
13. Carbohydrates that have the greatest cariogenic effect?
14. What does not contribute to the occurrence and progression of dental caries in children.
15. What hygiene products should be recommended for children 4 years old
16. Brushing the teeth of a child 3 years old helps
17. The most important role in the development of tooth decay plays?
18. It is recommended to keep the toothbrush
19.Oral hygiene involves brushing at least?
20. Who performs individual oral hygiene?
21. What is a basic oral hygiene product?
22. What does not belong to the stages of FONES brushing.
23. When a pellicle forms on the tooth surface
24. How can a pellicle be detected?
25.Saliva consists of
26. A decrease in saliva is called
27. The Green-Vermillion index is used to determine
28. In 3-year-old children, oral hygiene is assessed using the index:
29. The main source of ingestion of fluoride in the human body is
30. In what diseases do we prescribe vitofluoride?
31. In the enamel cells are not restored
32. For diagnosis of focal demineralization of enamel a solution is used
33. According to the localization of the lesion, a distinction is made between34. Why the surface layer of enamel undergoes changes in caries in the stain stage
35. When does demineralization occur?
36. What substance is not used for remineralizing therapy.
37. The amount of calcium salts in saliva.
38. Where is the center of salivary flow located?
39. Which trace element actively affects the metabolism of oral fluid?
40. Saliva in caries increases the activity of