



## NEW TECHNOLOGIES IN DENTAL TREATMENT

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### ABSTRACT

Modern visits to the dental clinic have long ceased to be associated with fear and pain. This has become possible due to the constant improvement of techniques and the search for new effective methods of pain relief.

**KEYWORDS:** Innovations, innovative technologies, dentistry, innovative dentistry, clinic, digital technologies.

### INTRODUCTION

Today, caries can be treated without using a drill, using the most gentle approaches that are a manifestation of the high skill of the doctor, the amazing capabilities of modern technology, and also provide comfort and safety for the patient.

**Chemical-mechanical technique.** One of the new methods of treating caries, which is actively used today, is called the chemical-mechanical technique. It allows painlessly and silently eliminating lesions of dental tissues, without affecting or damaging healthy areas of dentin. Here is how this process occurs in practice:

A special gel containing sodium hypochlorite and a mixture of three different amino acids is applied to the problem area of the tooth. The carious cavity is treated using special instruments that remove the affected dentin. As a result of such treatment, the tooth "cavity" becomes significantly smaller than with traditional drilling, and less filling material is required. It is noteworthy that anesthesia is not required, since only dead tissue is removed, and the patient does not feel pain.

**Air-kinetic technique.** The air-kinetic technique is successfully used to treat superficial caries. This technology involves the high-pressure supply of a mixture of water, air and abrasive powder. During the high-pressure dental treatment, diseased tissues are washed out, the carious cavity is completely cleaned, and damage to healthy dental tissues is excluded. The possibility of infection of healthy tissues is also excluded, which is always a risk when instruments come into contact with teeth. The air-kinetic method is effective in the initial stages of carious lesions of dentin, as well as in the development of secondary caries, which can occur under a filling. **Laser treatment.** Dental treatment using a laser is a modern method that allows you to avoid drilling. The laser selectively affects diseased and healthy tooth tissues, using the properties of light radiation. Carious areas of the tooth have special characteristics, such as a large amount of mineral salts and a smaller amount of water. Due to these distinctive properties, the laser can point and effectively affect carious areas, penetrating them and "evaporating" the infected tissue. The process of laser tooth treatment is as follows:

The doctor applies a special gel to the diseased area of the tooth, which contains certain substances that increase the effectiveness of the laser effect. A laser beam, tuned to a certain wavelength, activates the gel and is directed to the carious areas of the tooth. Under the influence of laser radiation, a photochemical reaction occurs in the carious tissue, as a result of which the infected tissue evaporates and is disinfected. It is important to note that laser treatment makes the "hole" in the tooth much smaller than traditional drilling methods. This allows you to preserve most of the healthy tissue and minimize the amount of filling material. Laser tooth treatment is usually painless and anesthetic-free, as the procedure is aimed at removing only the affected tissue, without affecting healthy areas.

Laser dental treatment is an innovative and effective approach that allows patients to avoid the discomfort and pain associated with traditional dental drilling. It also helps preserve healthy tooth tissue, ensuring patient comfort and safety during the caries treatment procedure.

**Ozone therapy.** Ozone therapy is another effective method of painless and gentle caries treatment, which is especially suitable for baby teeth. This method also does not use a drill, which makes it more comfortable for the patient. Based on the bactericidal properties of ozone, this technique was developed in Germany and has many advantages. Ozone is a powerful oxidizer that can effectively destroy bacteria and microorganisms that cause caries, without the need for anesthesia or drilling. The ozone therapy process is as follows:

The doctor uses a special soft silicone cup, which is not like a drill, to deliver ozone to the affected tooth. Ozone is supplied under high pressure as a gas, mixing with air or oxygen, and creates an antimicrobial environment in the oral cavity. The ozone therapy process lasts only 20-40 seconds, during which ozone penetrates the affected areas of the tooth and destroys bacteria. After that, the tooth is treated with a special composition that strengthens the dental tissue and promotes its regeneration. Ozone therapy can be used to treat the initial stages of caries, as well as for secondary caries that occurs under the filling.

Ozone therapy is not only effective in combating caries, but also helps preserve healthy dental tissue, since it is aimed only at destroying infected tissue. Due to the absence of pain, noise and vibration, ozone therapy is a comfortable procedure, especially for children. Treatment of caries using ozone therapy is an innovative approach that ensures safety, efficiency and minimal discomfort for the patient. **Machine endodontics.** To treat complex cases, such as periodontitis and pulpitis, when widening and filling of dental canals is required, an innovative method known as machine orthodontics is used. This technology is based on the use of a special endodontic tip and rotating instruments made of nickel-titanium (Ni-Ti) alloy. These instruments, called profiles, have special properties that allow widening and treatment of canals of any shape without the risk of damaging dental tissue. The process of machine orthodontics is as follows:

After conducting diagnostics and determining the need for root canal treatment, the doctor uses a special endodontic tip, which is connected to a specialized dental machine. Rotating nickel-titanium instruments are carefully inserted into the root canal and begin to gently and smoothly expand it. Due to the special properties of the nickel-titanium alloy, the profiles provide flexibility and precision when working in narrow and curved canals, which allows you to effectively clean the canal from infected tissue and microorganisms. After the canal is widened, it is filled with a special material to prevent re-infection and ensure the stability and health of the tooth. Machine orthodontics is a modern and reliable method of treating complex cases of

dental diseases that require root canal treatment. This method allows doctors to accurately and effectively treat problem teeth, minimizing the risk of damage to surrounding tissues. In the dental clinic, caries treatment is carried out using the most effective modern methods. Sign up for an initial free consultation with us.

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