Electroodontodiagnostics (EDD) is a method of studying teeth based on determining the threshold excitation of pain and tactile receptors in the dental pulp when an electric current passes through it.

The process of studying the electrical excitability of teeth is called electroodontometry (EOM).

It is important to note that EDI makes it possible to study not so much the state of the dental pulp itself, but characterizes its nervous system and its condition. During various pathological processes in tooth tissues, in addition to changes in the histological structure, dystrophic processes occur in the nervous tissue of the pulp, which is reflected in changes in threshold electrical excitability. It is also necessary to remember that EDI data may change due to various pathological processes in the periodontal tissues and nerves of the maxillofacial area.

The electrical excitability of intact teeth with formed roots is 2-6 μA. When performing electroodontometry, pulp sensitivity indicators for dentin caries are recorded in the range from 2 to 10 μA.

• K04.00 Pulpitis. Initial (hyperemia) - Threshold sensitivity during EDI is reduced to 10 μA.

• K04.01 Pulpitis. Acute - Threshold sensitivity for EDI is reduced to 20 - 25 µA.

• K04.02 Pulpitis. Purulent [pulp abscess] - Threshold sensitivity for EDI is reduced to 60 - 80 µA.

• K04.03 Pulpitis. Chronic - Threshold sensitivity for EDI is reduced to 50 μA.

• K04.04 Pulpitis. Chronic ulcerative - Threshold sensitivity for EDI is reduced to 60 μA.

• K04.05 Pulpitis. Chronic hyperplastic [pulp polyp] - Threshold sensitivity for EDI is reduced to 50 - 60 μA.

• K04.4 Acute apical periodontitis of pulpal origin - Threshold sensitivity for EDI is reduced to 200 μA.

• K04.5 Chronic apical periodontitis - Threshold sensitivity for EDI is reduced to 100 - 160 µA.

• K04.6 Periapical abscess with fistula - Threshold sensitivity for EDI is reduced to 100 - 160 μA.

• K04.7 Periapical abscess without fistula - Threshold sensitivity for EDI is reduced to 160 - 200 µA.

• K04.8 Root cyst - Threshold sensitivity for EDI is reduced to 100 - 160 µA.

• K04.80 Root cyst. Apical and lateral - Threshold sensitivity for EDI is reduced to 100 - 160 µA.

Methodology for conducting electroodontometry.

The tooth is isolated from saliva and thoroughly dried with cotton balls. The passive electrode is placed in the patient's hand. When examining intact teeth, as well as teeth covered with fillings, the active electrode is placed on sensitive points of the tooth:

• On the front teeth - the middle of the cutting edge;

• In premolars - the apex of the buccal cusp;

• In molars - the apex of the anterior buccal cusp;

• In carious teeth, the active electrode is placed at the bottom of the carious cavity.

Electroodontodiagnostics is widely used in dentistry. According to the works of Professor L.R. Ruby on the teeth there are sensitive points from which irritation is caused by the lowest current:

On the frontal teeth, these points are located in the middle of the cutting edge, on the chewing teeth - on the top of the anterior buccal tubercle. EDI is performed by applying a conductive medium to a pre-dried tooth and placing the tip of the electrical pulp tester probe on the surface of the tooth closest to the pulp horn. Then the patient needs to pass the end of the conducting probe to complete the circuit and agree that he releases it (in some devices presses a button) when he feels a tingling sensation. The use of this type of test is not advisable for patients with pacemakers. Caution should be used when using the electrical pulp test on a tooth adjacent to metal restorations, as they may create electrical conductivity and produce false negative results.

In the presence of pronounced periapical changes (periodontitis, radicular cyst), electrical excitability may be completely absent.