POLTAVA STATE MEDICAL UNIVERSITY
THERAPEUTIC STOMATOLOGY PROPAEDEUTICS CHAIR

ANESTHESIA
USING FOR TREATMENT OF CARIES, PULPITIS, PERIODONTITIS

Lecture for 3-rd year students
of international faculty

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The plan

1. The problem of painless treatment.
2. Psychological preparing of the patients.
3. Premedication by pharmacological remedies.
4. Kinds of anaesthesia.
5. Local anesthetics, applied in therapeutic stomatology.
6. Anaesthesia using for treatment of pulpitis and periodontitis.

- The problem of painless treatment of a teeth, despite the big achievements in anesthesiology, still remains one of the most actual.
- The big number dental procedures, which were carried out without anaesthesia before, now is been required.
- On the one hand, it is caused by arising of "delicacy" of the population, losing endurance to a pain and demanding more and more comfort. On the other hand, commercial stomatology began to "impose" anaesthesia in any occasion. According to modern researches (to K.F.Bizljaev, 1989) 74% patients need various kinds of anaesthesia.

The preparing for forthcoming treatment is not simply desirable, but is obligatory for the majority of stomatological patients.

Psychopreparing includes an explanation, belief or rebelief, conversation for suggestion of expediency of carrying out stomatological intervention and conviction in painless forthcoming interventions.

- It is possible only on condition:

- Creation of a guarding conditions in stomatological consulting room;
- The observation of ethics and deontology by the doctor.

«Platsebo - effect"

- Except psychological preparing probably application of indifferent medical substances. Their application is connected with simultaneous psychological influence the patient and provides using of medicinal forms of inactive substances with suggestion to the patient of anaesthetizing and sedative efficiency of these remedies. It, so-called, «platsebo - effect"

In such cases apply:

- Calcium gluconatis,
- Calcium glicerophosphatis
- glucose in tabl.,
- Vitamin C

Premedication

is an application of remedy, which can actively correct infringe-ments of a psychoemotional condition before the stomatological intervention.

Tranquilizers

- ✓ meprobomatum - 0,2-0,4 g
- ✓ Gidazepam IC - 0,05 g
- ✓ triocksazinum - 0,3
- ✓ mesapamum - 0,005 g
- ✓ seducksenum - 0,005 g

Analgetic

- ✓ sodium salicylatis - 0,025-0,5 g
- ✓ aspirinum - 0,5 g
- ✓ salicylamidum- 0,5 g
- ✓ analginum - 0,5 g
- ✓ butadionum - 0,15-0,3 g
- ✓ fenacitinum - 0,25-0,5 g
- paracetamolum - 0,2 g

Sedative means

- ✓ Tincture of valerianum,
- ✓ Tinct. of peony.

Somnolent remedies:

- ✓ Barbitalum - 0,25 g
- ✓ Luminalum - 0,05 g
- ✓ Nembutalum- 0,05 g

The most rational following combinations:

Seducsenum 0,005g +

Closepinum,025 g (before sleeping)

Butadionum 0,15g +

Fenacitinum 0,25g

The official combined remedy “tempalginum” has appeared, one tab. contains 0,02 g tempidonum (tranquilizer) and 0,5 g analginum

Regimen of preparation

Painless preparation can be achieved by application of a regimen of preparation.

Regimen of preparation are protective measures, allowing to exclude the adverse factors, which are causes of painful sensations:

1) vibration;

2) pressure on hard tissues of tooth;

3) overheat or cooling of hard tissues of tooth.

The cause of vibration is unsteadily fixed burs in handpiece, let out bush. Pressure arises if working slowly-rotating blunt tool (repeatedly sterilized steel burs) .

The work by usual stomatological handpieces with rate of 10-30 thousand per minute renders pressure on hard tissues of tooth about 1000 g. Turbine hand pieces (rate of 300-500 thousand per minute) put pressure about 10 g.

Preparing rules:

1) acute burs with high cutting ability (an enamel-diamond burs, dentin-hard-alloy);

2) not vibratable handpieces where burs are densely fixed;

3) on very high speed;

4) intermittent comma-shaped movements;

5) to apply water cooling;

6) in deep c\c to avoid cooling and trauma of a pulp it is better to apply middle-sized burs on low rate.

Kinds of anaesthesia

To decrease or full exclusion of painful sensations during treatment had to be applied anaesthesia.

- *Distinguish two kinds of anaesthesia:*

- Local

- General

Local anaesthesia

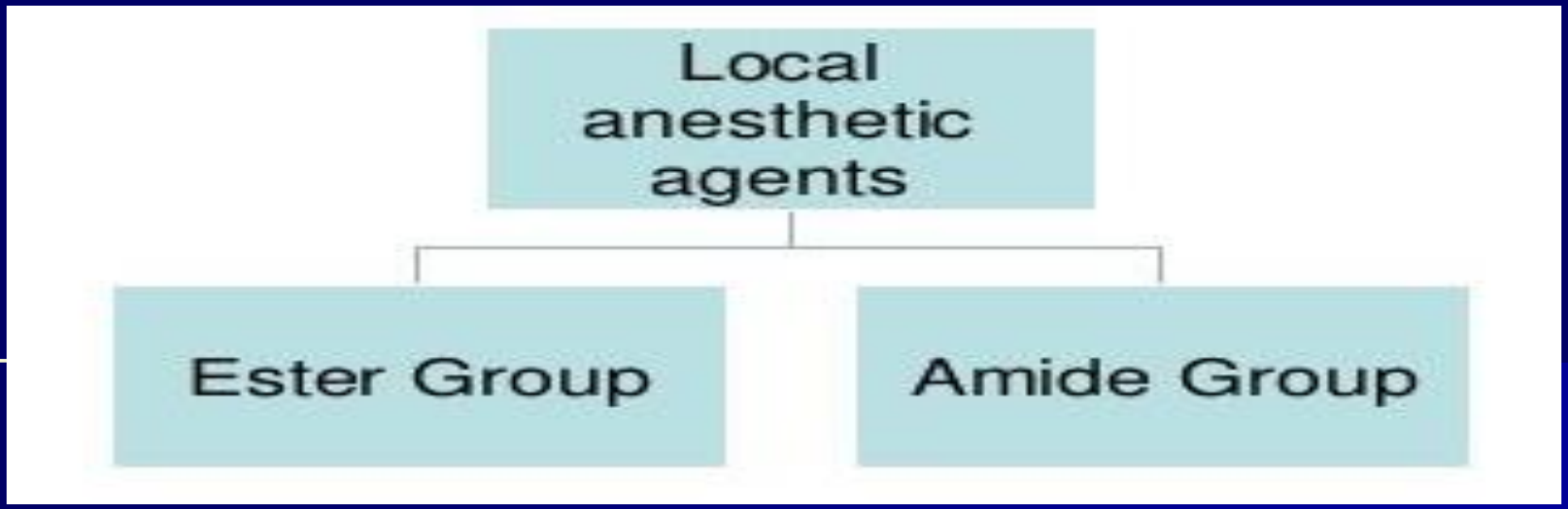
- means termination of conducting of impulses on sensitive nervous fibers or blockade of receptors.

- **Indications to local anaesthesia:**

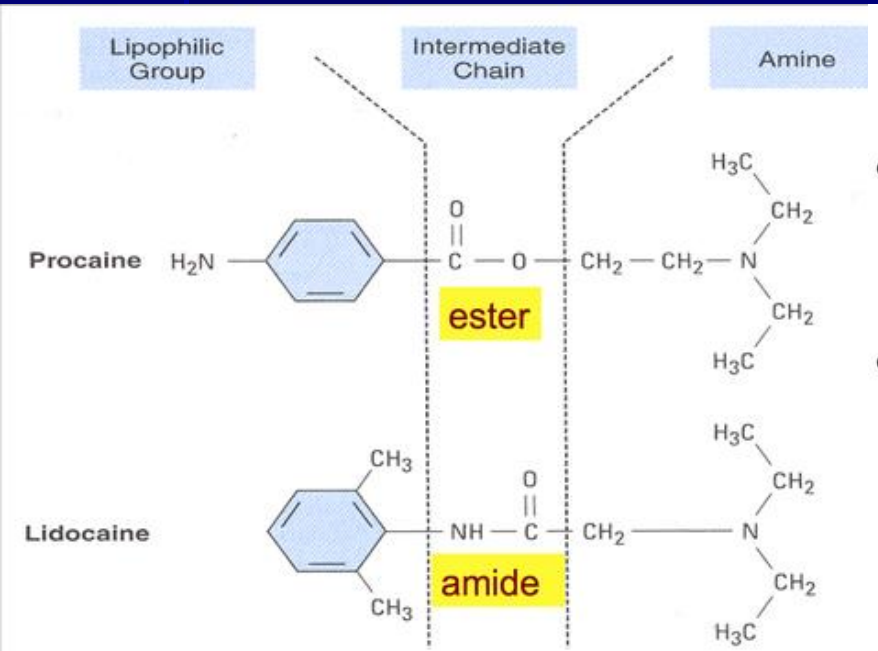
1. Local hyperesthesia of hard tissues of tooth with infringement or without it.
2. Functional frustration of the nervous system, the expressed fear of forthcoming medical interventions.
3. All forms complicated of caries (pulpitis, periodontitis).
4. Tooth extraction.
5. Surgical manipulations at periodontal diseases and mucous.

Contra-indications:

1. Allergic reactions to local anesthetics.
2. The expressed cardiovascular insufficiency.
3. Infringement of function of a liver and kidneys with the phenomena of decompensation (a cirrhosis, a nefrozo-nephritis).
4. Organic diseases CNS (a schizophrenia, olygophrenia).
5. Refusal of the patient of a local injection.

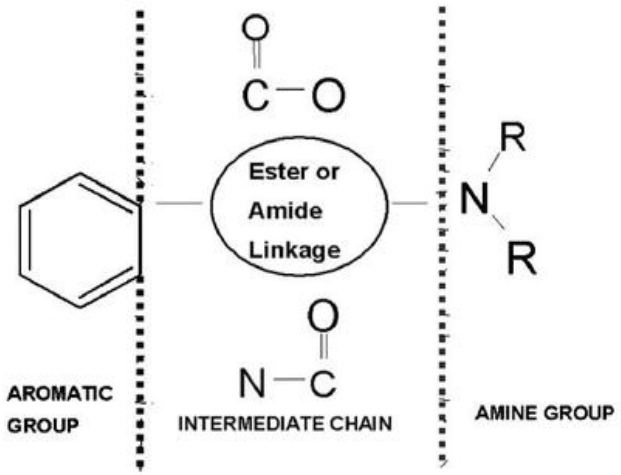


Amino amides have an amide link between the intermediate chain and the aromatic end, whereas amino esters have an ester link between the intermediate chain and the aromatic end.



The Local Anesthetic Molecule

- Local anesthetics consist of an aromatic ring and an amine, separated by a hydrocarbon chain
- Two types of local anesthetics based on the hydrocarbon chain linkage
  - Esters have [-CO-O-] linkage
  - Amides have [-HN-CO-C-] linkage



Local anesthetic solutions for injection typically consist of:

- The local anesthetic agent itself
- A vehicle, which is usually water-based or just sterile water
- Vasoconstrictor possibly
- Reducing agent (antioxidant), e.g. if epinephrine is used, then sodium metabisulfite is used as a reducing agent
- Preservative, e.g. methylparaben
- Buffer

Choosing the type of anesthesia and anesthetic

- The success of injection anaesthesies depends on a correct choice of anesthetics.
- For choosing local anesthetics, it is necessary to consider:
- Efficiency,
- Safety,
- Specific features of the patient,
- Presence sensibilization to remedies,
- Duration of medical manipulation.

Comparative characteristics of local anesthetics

Active ingredient	Efficacy	Toxicity	Duration	Max dose	Vasodilatory properties	Vasoconstrictor concentration
Novocaini	1	1	30	500	++++	Adr.1:50000
Lidocaini	4	2	60	300	+++	Adr.1:50000
Trymecaini	3	1,5	50	500	+++	Adr.1:50000
Mepivocaini	4	2	50	400	+/-	Adr.1:2000000
Prilocaini	4	2	45	400	+	Oksapressine 1:18500000
Articaini	5-6	1,5	30	500	+	Adr.1:200000
Bupivocaini	8	8	To 4 h.	175	++	Adr.1:200000

Local anesthetic cartridge color codes

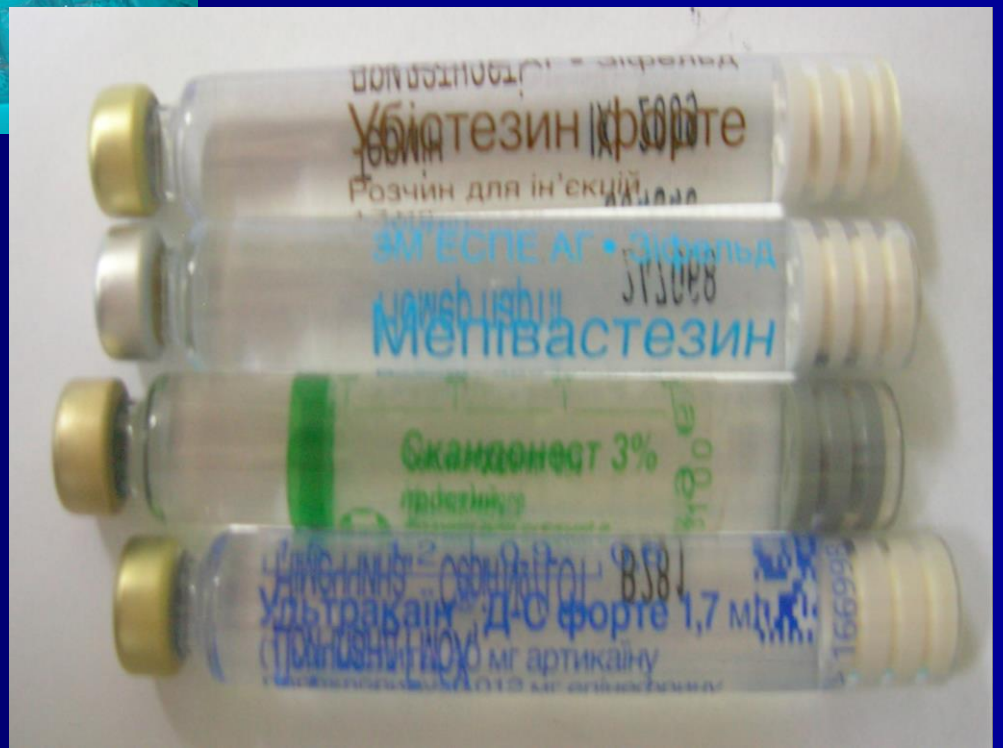
Newly mandated uniform system for local anesthetic cartridges bearing the ADA Seal of Acceptance.*

PRODUCT	COLOR
Lidocaine 2 percent with epinephrine 1:100,000	
Lidocaine 2 percent with epinephrine 1:50,000	
Lidocaine plain	
Mepivacaine 2 percent with levonordefrin 1:20,000	
Mepivacaine 3 percent plain	
Prilocaine 4 percent with epinephrine 1:200,000	
Prilocaine 4 percent plain	
Bupivacaine 1.5 percent with epinephrine	
Articaine 4 percent with epinephrine 1:100,000	

The name of anaesthetic	The main acting substance	Firm	Vasoconstrictor	Acting begins after:	Duration of anaes-thesia
Alphacain	Articaini	SPAD	Adrenalinum	1-2	60-120
Deltazin		A.T.O. Zizine	Only 4 % s-n without vazo-konstriktor	1-2	60-90-120
Primacaine		Piere Rolland	Adrenalinum	1-2	60-100
Septanest		Septodon	Adrenalinum	1-2	60-120
Ubestezine		ESPE	Adrenalinum	1-2	60-120
Ultracain		Hoechst	Adrenalinum	1-2	60-120
Bucanest		Biodica	Only 4 % s-n without vazo-konstriktor		60-100

Xylonor	Lidocainum	Septodont	Noradrena-linum	2-3	90
Xylorolland		Piere Rolland	Without vazo-konstriktor	2-3	90
Xylocaine		Dentoria (Astra)	Only 4 % s-n without vazo-konstriktor	2-3	90
Prissicaine		SPAD	A - Without vazokonstriktor N -Noradrena-linum	1-3	60-90
Citanest	Xylorolland	Dentoria(Astra)	adrenalinum	2-4	90
Pradicain	Xylocaine	Piere Rolland	Without vazo-konstriktor	1-2	60-90
Scandikane	Prissicaine	Septodont	3 % p-p without vazo-konstriktor	1-2	90

Anesthetics for local anaesthesia



The equipment for anaesthesia

Kinds of syringes:
dental, disposable

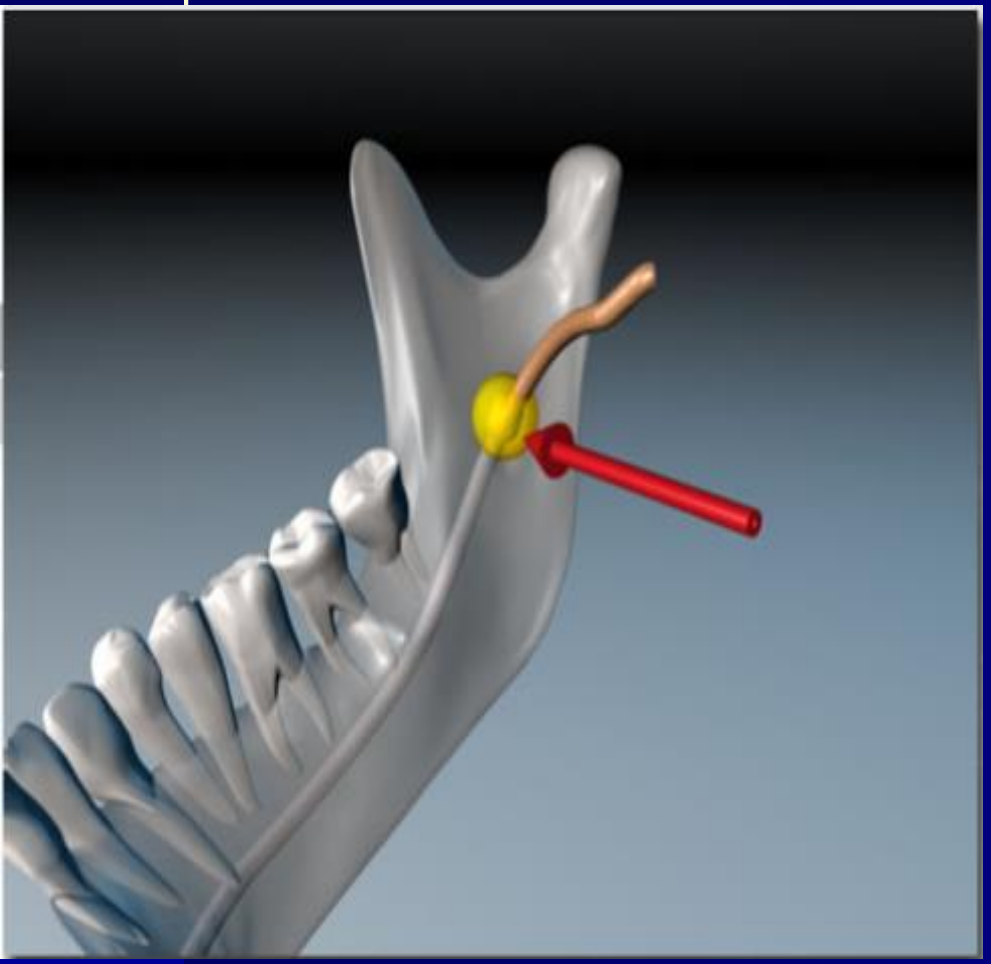
Among injectional anaesthesias distinguish :

Conduction anaesthesia	**Infiltration** anaesthesia
For teeth of the mandibular ➢ **Mandibular** ➢ **Torusal** ➢ **The mental** For teeth of the maxilla ➢ Tuberal ➢ Infraorbital ➢ Incisive ➢ Palatinal	➢intraligament ➢Intrapulpal ➢Intraosseous ➢ Subperiosteal

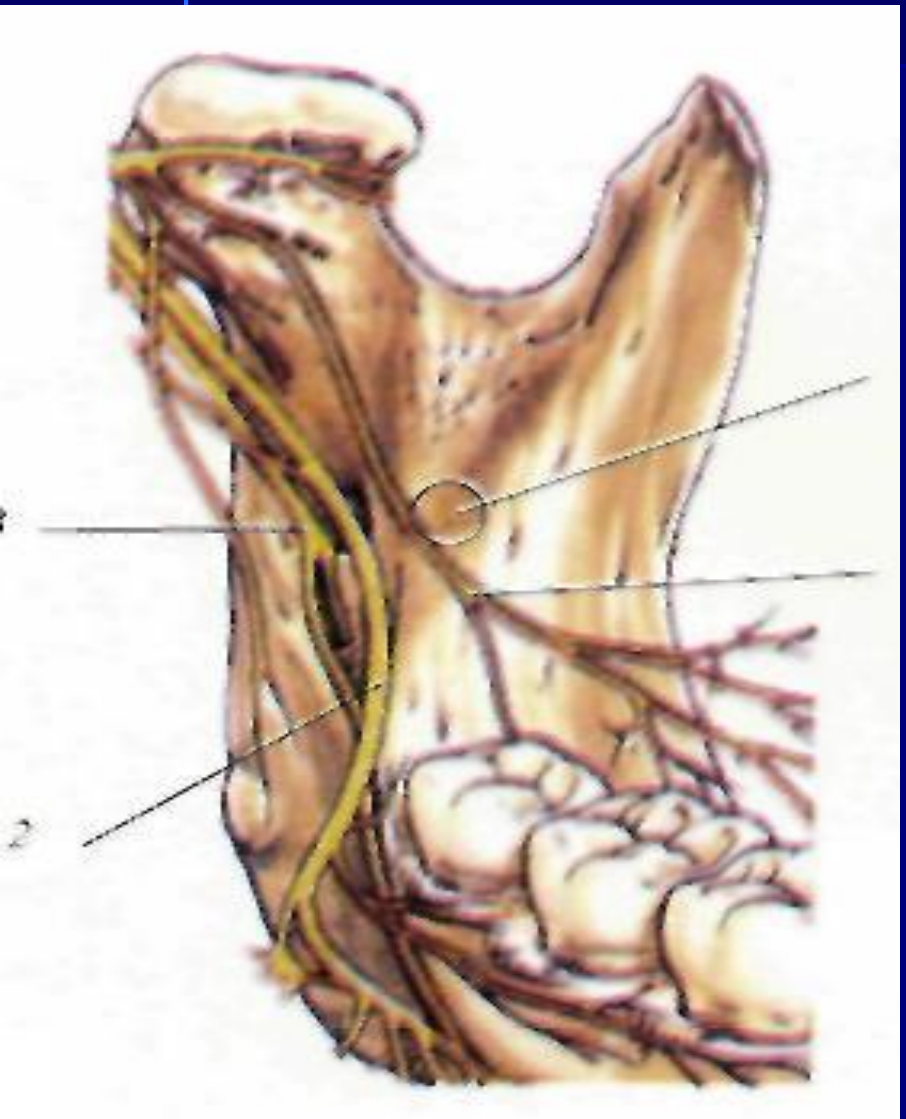
Tuberal anaesthesia

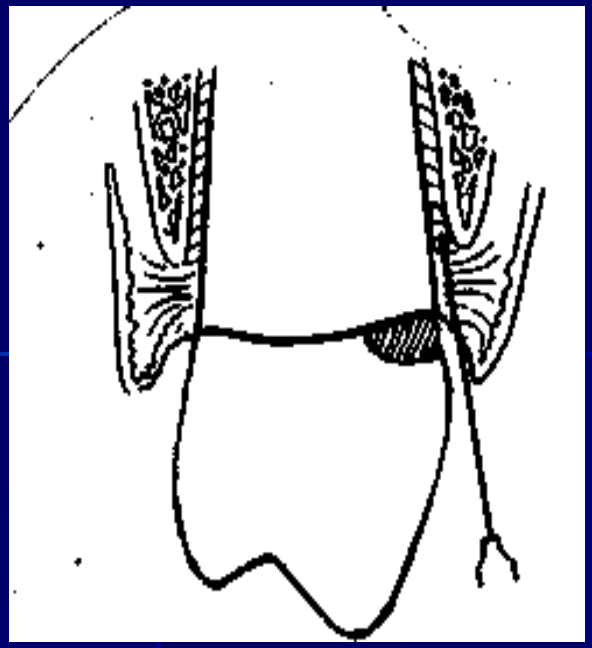
Infraorbital anaesthesia

Mandibular anaesthesia

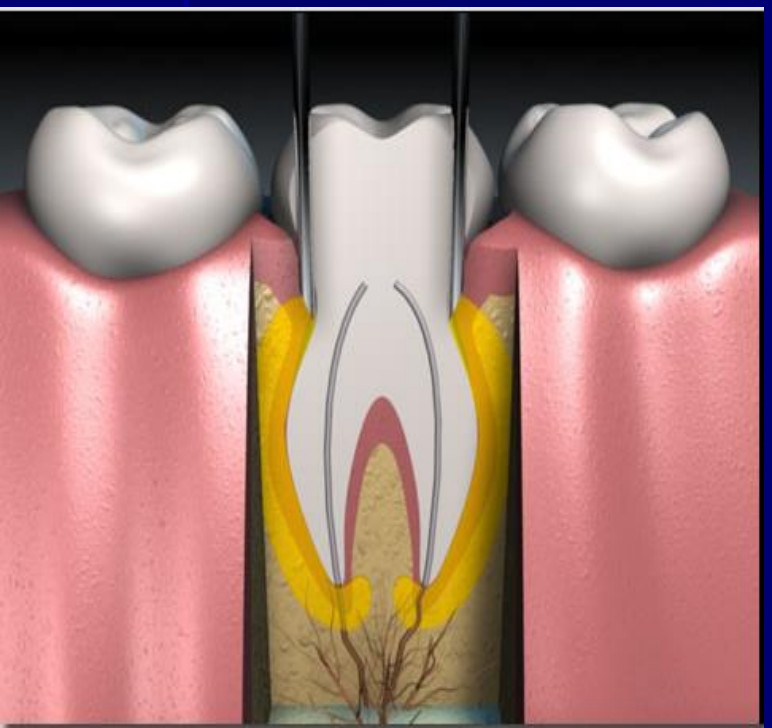


Torusal anaesthesia





Intraligamental anaesthesia



- - is a version of infiltration anaesthesia. It is carried out by injection of 0,1-0,2 ml anesthetic in healthy circular periodontal ligament.

Advantages of anaesthesia:

- a small dose of anesthetic - 0,1-0,2 ml
- absence of such complications, as hematomas, bleeding, allergic reactions, hit of anesthetic in the vessels
- instant approach of anaesthesia - in 10 seconds
- anaesthesia lasts during 15-20 minutes

Contra-indications:

- sharp inflamation processes in a periodontium
- presence parodontal pockets

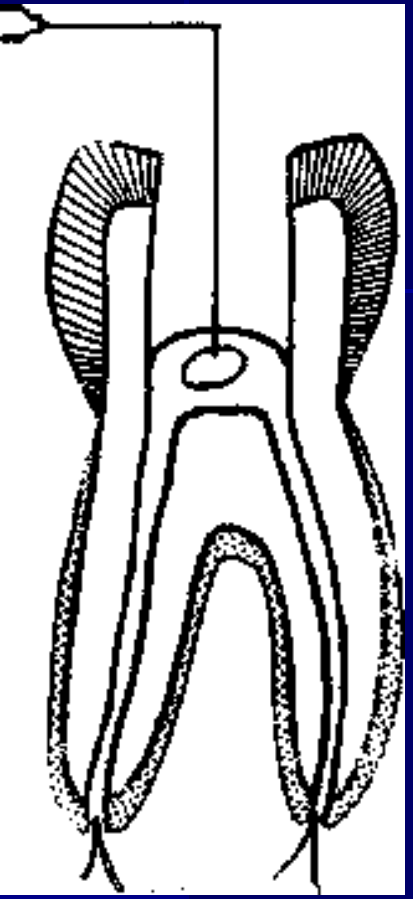
Intraosseous anaesthesia

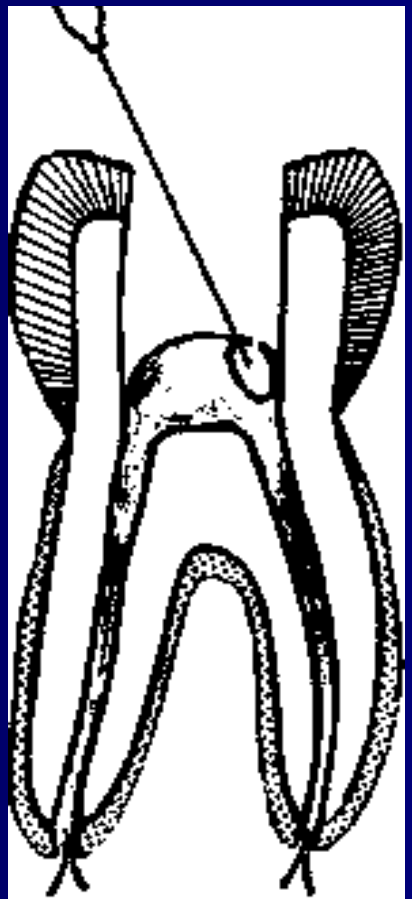
– is carried out by intrabone injection through cortical plate of alveolar process of anesthetic remedies with syringe. As result we can reach deep anaesthesia of a pulp and surrounding near tooth tissues.

- The effect is caused by extra vascular distribution of anesthetic in spongy substance of a bone and influence on passing here nervous plexus, and also its penetration through arterioveins system in a periodontium and a tooth pulp.

The injection had to be done into basis of gingival papilla.

Intrapulpal anaesthesia





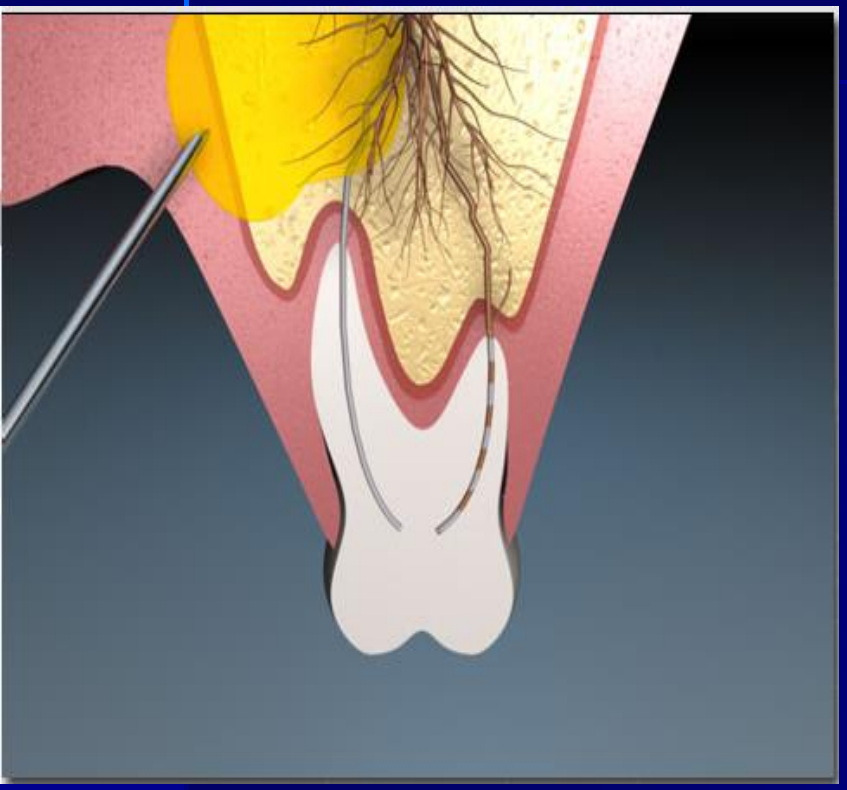
is applied as additional anaesthesia of a pulp at conservative-surgical or surgical treatment of a pulpitis. For this purpose we enter 0,1-0,2 ml of anaesthetizing substance through perforation aperture arch of pulp chamber with thin needle.

Contra-indications:

acute purulent pulpitis,

chronic gangrenous pulpitis, because it is possible to push contents of the root canal (debris) through root apex.

Infiltration anaesthesia



It is the blocking of peripheral and small nervous fibers by **infiltration** surrounding tissues with solutions of anesthetic.

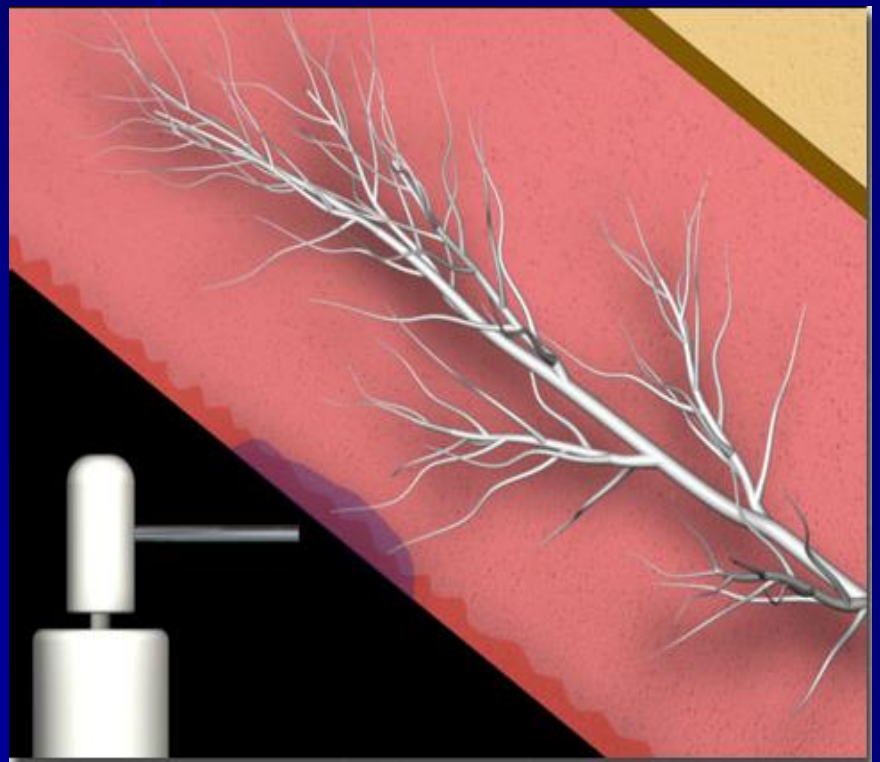
At pulpitis two-stages injection of anesthetic should be expedientive (V.I.Lukjanenko, 1974).

The dosage is usual, interval between injection about 15 minutes. First injection of solution of the remedy (0,8-1мl) eliminates parabiotic oppression of pulp nervous receptors, second - (0,8-1мl) - causes "true" anaesthesia.

Applicational anaesthesia

It is used for:

1. Anaesthezation of the injectional place;
2. Rubbing in hard tissues of teeth;
3. As additional anaesthesia



To this group is concerned:

- Platonov's liquid (№ 1 and № 2)
- Shinkarevsky's liquid (benzocainum, dicainum, menthol, ether, chloroform)
- Hartman's liquid (timolum, ether, sp. aethilicus)
- Groshicov's liquid (dicainum, lidocainum, menthol, chloroform, phenolum)
- 2-5 % sol. of dicainum
- 4-20 % sol. of propolis
- 10 % sol. of lidocainum
- solution "Falicainum"
- Powder of anaesthesinum
- Pastes: of trimecainum 70 %
  acetylsalicylicum
  medipalginum

Thanks for attention