**Local Analgesia in pediatric dentistry:**

Pain is the most important factor behind fear and anxiety in children.

* Fear: external due to sight, smell and sounds.
* Anxiety: internal threat, more difficult to control.
* Analgesia vs. anesthesia
* Anesthesia is the total loss of sensation.
* Analgesia is the effect of stabilization of the nerve ending.
* Allergy from local analgesia is rare due to the analgesic solution (ester or amide) but more due to the preservatives (bisulfate or met sulfate)
* **Types of LA:**
1. Amide types:
* more commonly used than ester.
* Lidocaine, mepivacaine, prilocaine, bupivacaine, and levo-bupivacaine.
* less allergic, more potent than ester type.
* Heat stable, long shelf life, slower onset and long duration
* Contra indicated in **malignant hyperpyrexia**.
1. Ester type:
* not used as much
* procaine (the most common in its category), cocaine, benzocaine, and tetracaine.
* Unstable in solution, fast acting, more allergic, less potent.
* Contraindicated in **choline esterase enzyme deficiency**, since the ester is metabolized in the liver by choline esterase.
1. Non-ester, non-amide type: dyclonine it’s a ketone used when patients are allergic to both previously mentioned.
* **Topical analgesia:**
* Most commonly used are: **lidocaine and benzocaine**.
* Topical analgesics are commonly misused, the dose of topical analgesia should be added to the whole dose of the analgesia given.

\*\*the general guidelines of application:

* The area of application should be **dry**.
* Only a **lentil seed size**, on the area of the **needle prick**.
* The taste of the topical analgesic isn’t tasty so children don’t like it.
* Should be left for at least **2 minutes**.

Notes:

* 1/3 cartridge is enough to anaesthetize a child if the technique is correct.
* Toxicity in anesthesia is irreversible, there’s no antidote but only caring for ABCs
* The larger the gauge the smaller the diameter of the needle.
* The bevel of the needle should be parallel with the periosteum.
* **Four mistakes are the most common made by dentists when attempting to anaesthetize a child or through the procedure:**
1. Waving the needle in front of the child.
2. Not getting firm control of the patient head and hands.
3. The use of long or short needle, a short needle could be used only in IANB. Always use an **ultra/very short needle**.
4. The use of inappropriate doses for children.
* **How to administer**:
1. **Good retraction**: to **lower** the number of nerve endings touched by the needle (less pain), and to **lower** the stress against the needle.
2. Infiltration in the upper and lower arch except **for lower 2nd primary molar.**
3. Don’t go very deep in the sulcus and touch bone. Give few drops once in tissue then give another injection that could touch the bone without any pain.
4. Slow injection.
5. Any ballooning during anesthesia is a failure of anesthesia.
* **Problems that might prove harmful to the patient**:
1. Bubbles in the cartridge due to a loose stopper.
2. Extended stopper.
3. Burning sensation upon injection.
4. Rust in the cap, or expired cartridge.
5. Leakage during injection from around the hub.
6. Broken cartridge.
* **Methods of administration in pediatric dentistry:**
1. **Jet injection:**
* Used as topical anesthesia, you apply it to the mucosa and you just press the trigger.
* It doesn’t have a needle; it just pushes the solution into mucosa using pressure.
* Has a pin grip.
1. **CAT technique:** like intraseptal technique.
* At the crest of the interseptal bone between two teeth at **45 degrees** angle.
* It is very painful.
* Infiltration should be given before we use this technique.
1. **Intraligamental technique**:
* This technique is used when we have tried infiltration and the patient is still in pain and not anesthetized.
* It has a special needle for its administration, we insert it between the cementum of the root and the periosteum, inside the periodontal pocket.
* Site: at the **distobuccal** corner of the tooth in upper and lower teeth.
* To insure success we should have: **back flow** (high force is needed to administer the LA solution), and **blanching of the tissues**
1. **Infiltration:**
* All the maxillary primary teeth are anesthetized using this technique.
* The injection should always be distal to the tooth to be anesthetized.
* It should be a slow injection.
* The problem with this technique is when it’s given in the palate since the needle touches bone once we enter the mucosa so it’s very painful.
1. **Interseptal bone technique**:
* Given in the buccal triangle of the interseptal bone (more towards the base of the triangle), parallel to the occlusal plane.
1. **Mandibular block (IANB):**
* A short needle should be used.
* Few drops of anesthesia should be given before we continue our injection and wait 2 minutes.
* In children anyone will touch bone but the needle should be directed **downwards** because the angle of the ramus is **obtuse** and the mandibular foramen is located more **inferiorly**.
1. **Intrapulpal:**
* Very painful injection.
* Once the pulp is exposed you apply topical anesthesia and give this injection; Topical anesthesia reduces the amount of pain.
* It’s a very effective technique.
1. **Intrapapillary**:
* Given to avoid palatal infiltration.
* We enter 2-3 mm inside the triangle and inject we see blanching on the palatal side.
* It’s a soft tissue injection.
* **Complications:**
1. Cheek and lip biting:

-injections that don’t cause this problem are intraligamental, intraseptal and CAT technique.

-We must tell the parents to watch the child until the effect of the LA wears off. We shouldn’t address the child about this since we might induce this behavior.

-We can use a cotton roll and place it between teeth and the soft tissues thus preventing the biting.

-We see check biting more in the lower lips.

1. Intravascular injection:

-The most important thing about injections especially IANB in children **is aspiration**.

**-If you inject inside the artery**:

1. Ipsilateral and downward movement of the eye. (drop of the eyelid laterally).
2. Diplopia.
3. Blanching: in the palate and infraorbital area.

 3. Vasovagal attack

 4. Toxic reaction

 5. Anaphylaxis.

To avoid systemic reaction (Toxicity):

Aspiration before injection, slow injection, knowledge of the maximum dosage and watchful observation of the patient.