Pain and Anxiety  
(Dent 5-201)  
Armamentarium  
Local Anesthesia Administration  
Techniques  
Ma’Ann Sabino, DDS PhD  
Oral and Maxillofacial Surgery  
University of Minnesota

Armamentarium
- 1.) The Syringe
- 2.) The Needle
- 3.) The Cartridge

Types of Syringes
1) Non-disposable syringes
   a. Breech-loading, metallic, cartridge-type, aspirating
   b. Breech-loading, plastic, cartridge-type, aspirating
   c. Breech-loading, plastic, cartridge-type, self-aspirating
   d. Pressure syringe for periodontal ligament injection
2) Disposable syringe
3) Safety syringe
4) Computer controlled local anesthetic delivery systems

Syringe Components
- 1.) Needle adapter
- 2.) Piston with harpoon
- 3.) Syringe barrel
- 4.) Finger grip
- 5.) Thumb ring
Pressure syringe

Self-aspirating syringe

Non-aspirating syringe

Safety syringe
The Needle
- Gauge: the larger the gauge the smaller the internal diameter of the needle
  - 25g red cap
  - 27g yellow cap
  - 30g blue cap
Long Needle: 32mm
Short Needle: 20mm
Differences by manufacturer

Components of The Needle
- 1.) Bevel
- 2.) Shank (shaft)
- 3.) Hub
- 4.) Syringe adapter
- 5.) Syringe penetrating end

The Cartridge
- 1.) Cylindrical glass tube
- 2.) Stopper
- 3.) Aluminum cap
- 4.) Diaphragm
**Cartridge (carpule)**
- 1.8 mL (United States)
- 2.2 mL (UK and Australia)
- Should not be autoclaved
- Stored at room temperature (21°C to 22°C (70°F to 72°F))
- Should not soak in alcohol
- Should not be exposed to direct sunlight

**Preparation of the Armamentarium**
- 1.) remove syringe from sterile bag
- 2.) attach needle
- 3.) retract piston fully
- 4.) insert cartridge
- 5.) engage the harpoon
- 6.) carefully remove colored cap
Recapping the Needle

- Always use the scoop technique
- This is the time you are most likely to get stuck by the needle

NEVER DO THIS!
NEVER BEND NEEDLES!

Bent Needles

- “there is no injection technique used in dentistry that mandates a needle be bent for the injection to be successful”
- Handbook of Local Anesthesia
  - 4th edition 1997 pg89
  - Stanley Malamed

Bent Needles
- Bending needles weakens them
- Increases risk of needle breakage

Remove the cartridge from the syringe

- Withdraw the harpoon fully
- Place the cartridge in the sharps container

Removal of the Needle

- Remove the needle by twisting it off the needle adaptor – Leave the needle adaptor on the syringe!
- Place the needle in the sharps container
Other Armamentarium

1) Topical antiseptic (optional)
   Betadine
2) Topical Anesthetic (strongly recommended)
   - ointments, gels, pastes, sprays
   - sprays: unmetered, metered
3) Applicator sticks
4) Cotton gauze (2” x 2”)
5) Hemostat

Topical Anesthetics
DentiPatch (lidocaine transoral delivery system)
- Preinjection
  - 10-15 minutes exposure prior to injection
- Root scaling/planing
  - apply 5-10 minutes prior to beginning procedure

Injection Technique

Steps for Injection
1. Use sterilized sharp needle (fishhook)
2. Check the flow of local anesthetic solution
3. Position the patient (supine)
4. Dry the tissue
5. Apply topical anesthetic

Steps for Injection (cont)
6. Communicate with the patient (pain, discomfort)
7. Establish a firm hand rest
8. Make the tissue taut (stretching)
9. Keep the syringe out of the patient’s line of sight
10. Insert the needle into the mucosa level
Steps for Injection (cont)

11. Slowly advance the needle toward the target (few drops while advancing needle)
12. Aspirate (negative pressure, self aspirating syringe)
13. Slowly deposit the local anesthetic solution (1 mL/min, 1.8 mL/min practical)
14. Slowly withdraw the syringe (recapping, scoope technique)
15. Observe the patient

Maxillary Injection Technique

- Supraperiosteal (Infiltration)
- Posterior Superior Alveolar (PSA)
- Middle Superior Alveolar (MSA)
- Anterior Superior Alveolar (Infra-orbital)
- Maxillary (V₂ division) N. Block
- Greater Palatine N. Block
- Nasopalatine N. Block

Anatomical Landmarks

- Individual teeth
- Root areas
- Periosteum of the bone

Supraperiosteal Injection (Infiltration)

- Bevel: Toward bone
- 0.6mL
- Syringe: Parallel with long axis of the tooth
- Mucobuccal fold

Infiltration
Injection technique

- Posterior superior alveolar nerve block (PSA)

Posterior Superior Alveolar N. Block (PSA)

- 72% of mesiobuccal root of 1st molar will be anesthetized
- Injection height: Mucobuccal fold above the maxillary 2nd molar
- Bevel: Toward bone
- Depth: 16mm
- Aspiration, reaspiration (rotate the syringe)
- Positive aspiration: 3.1%
- Pterygoid Plexus of Vein (short needle )
- Success rate>95%

- Upward- Direct needle superiorly at a 45 degree angle to occlusal plane
- Inward- Direct needle medially toward midline at 45 degree angle to occlusal plane
- Backward- Direct needle posteriorly at a 45 degree angle to long axis of the second molar
**Disadvantages**
- Risk of hematoma
- No bony landmarks
- Second injection may be required
- Positive aspiration: 3.1%

**Middle Superior Alveolar N. Block (MSA)**
- Insertion of needle: 2nd premolar mucobuccal fold
- Bevel: Toward bone
- Anesthetized: 1st, 2nd premolar, mesial root of the 1st molar

**Injection Technique**
- Infra-orbital nerve block
  - Intraoral approach
  - Extraoral approach

**Infraorbital Nerve Block**
- PSA

**Anterior Superior Alveolar N. Block (ASA) (Infraorbital N. Block)**
- Anesthetized: Pulp of the maxillary central incisor through the canine on the injection side
- 72% of patients, pulp of Mx premolars and mesiobuccal root of the 1st molar (only 28% of population present MSA nerve)
- Area of Insertion: over the first premolar
- Target: Infraorbital foramen
- Infraorbital notch – concavity
- Needle length: 16 mm
- Deposit: 0.9 – 1.2 mL
Infraorbital Nerve Block

Palatal Anesthesia

- Traumatic experience
- Pain – discomfort
- Topical anesthesia
- Pressure anesthesia
  - Cotton applicator stick
  - Handle of a mouth mirror
  - Ischemia (blanching)
- Deposit solution slowly
- Finger rest. Elbow rest.
Nasopalatine N. Block

Through the palate
Through the labial

Two approaches:

i) Palatal: lateral to the incisive palpilla
   Anesthetized: anterior portion of the hard palate
   (soft & hard tissues) from both sides of mesial of
   1st premolar
   Advance needle toward foramen (5mm)
   Continue to deposit small amount of anesthetic
   throughout the procedure (any injections)
   Deposit: 0.45 mL

ii) Labial approach (2-3 injections)
   a) inject labial frenum
   b) interdental papilla
   c) possible lateral to the incisive papilla
**Greater Palatine N. Block**
- Extended neck
- Open wide
- Find the depression (distal to the 2nd molar)
- Depth < 10mm
- 0.45 – 0.6mL
- Anesthetized: distal of 1st premolar
  (Hard and Soft tissue)

**Maxillary Nerve Block**
*(2nd Division Nerve Block)*

Area anesthetized: Hemimaxilla
Deposit: 1.8ml
Two approaches
1) High-tuberosity approach
   pterygopalatine fossa
   depth: 30mm
1) Greater palatine canal approach
   through the greater palatine foramen
   depth: 30mm
Thank You