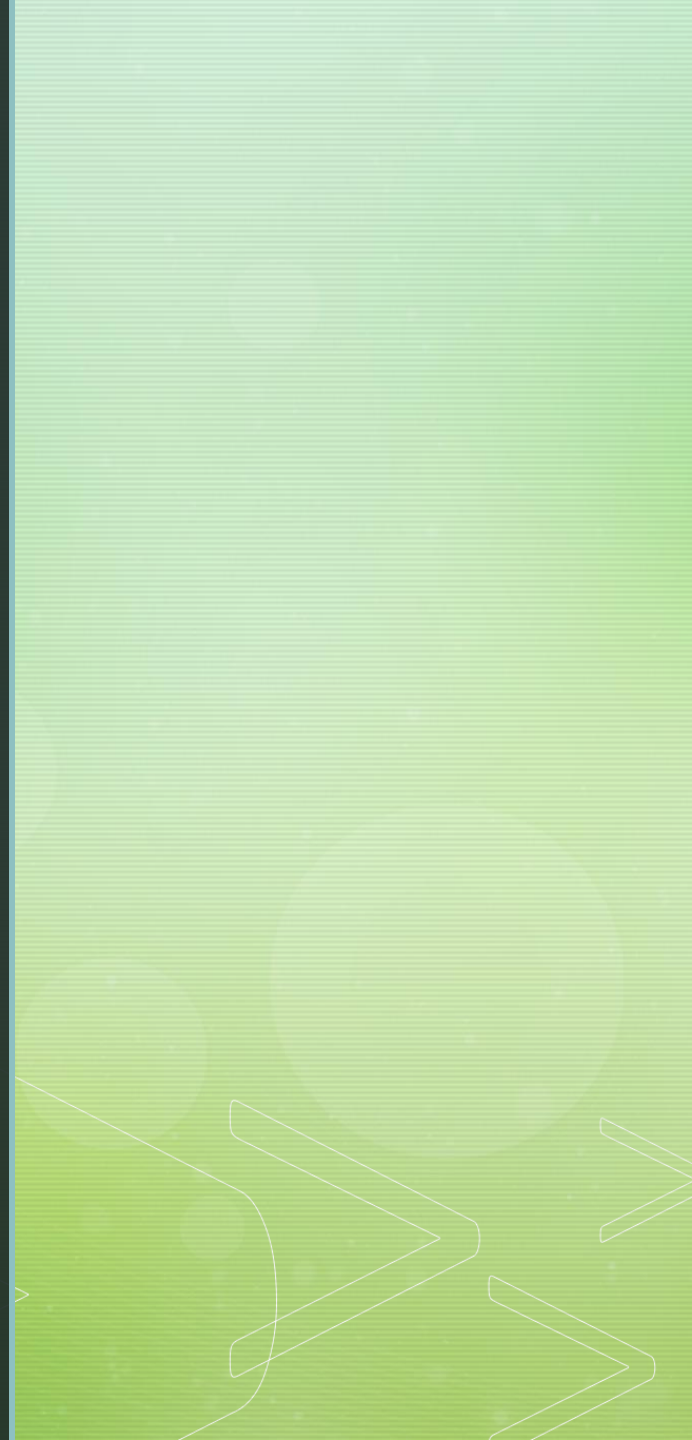


# Local Anesthesia Delivery Devices



# Armamentarium for Local Anesthesia

1. Mouth mirror or cheek retractor
2. Syringe device (self-aspirating or manual aspiration)
3. Q-tip with topical anesthetic (Benzocaine)- optional
4. Anesthetic agent (drug) in preloaded dental cartridges (1.7 or 1.8cc)
5. Gauze squares for drying of oral tissues
6. Dental needles (choose gauge & length)
7. Needle recapping device (engineer control)
8. Hemostat device for retrieval if needle breaks

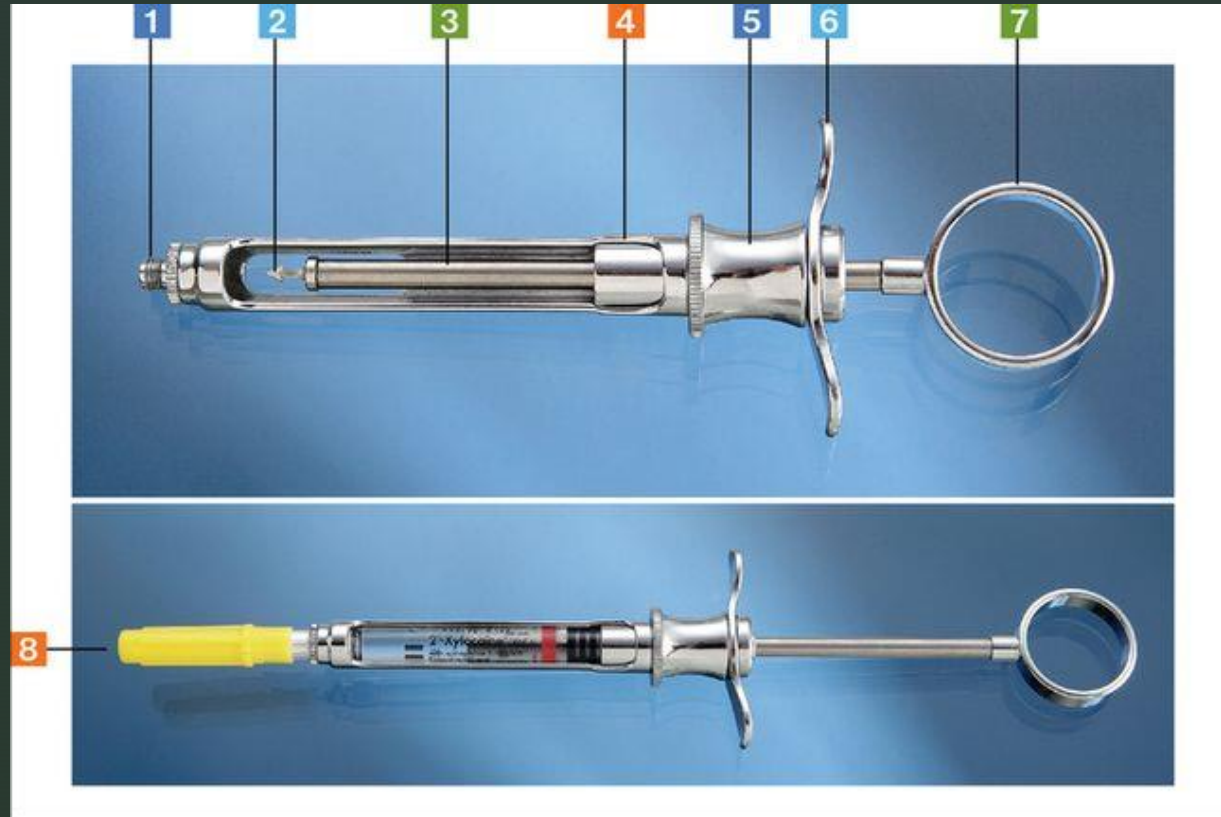




# Dental Syringes



## Identify the Components of the Dental Syringe



Ask the students to collectively Identify what each number is

# The Dental Syringe

## Types of Dental syringes:

- Sterilizable stainless steel
- Disposable plastic
- Ratcheted to deliver small doses of anesthetic under pressure (PDL injection)- rarely used
- Computer -Controlled Local Anesthetic Delivery have replaced the ratcheted syringe

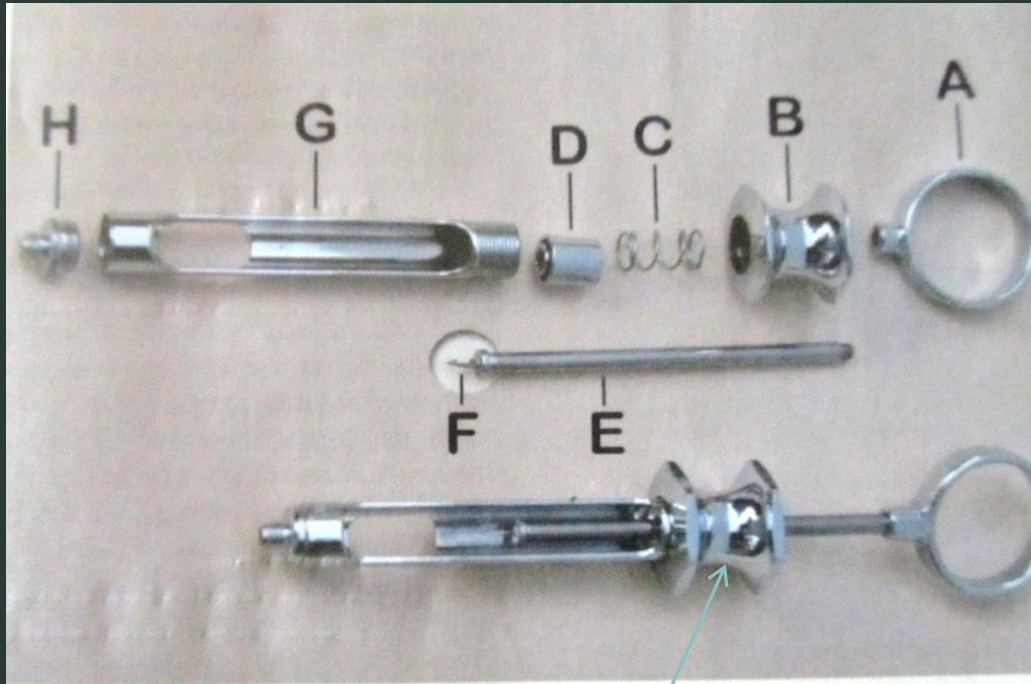


**CCLAD**



Not really  
used any more

# Most Commonly used Dental Syringe is the Breech-loading manual aspiration cartridge-type devices



- A= Thumb Ring
- B= Finger grip
- C= Spring
- D= Guide Bearing
- E& F = piston with attached Harpoon
- G= Syringe Barrel
- H= Needle adaptor

Note the finger grip can be wingless or winged



# Dental Syringes

Are being created to accommodate different size hands:

- LENGTH OF THE SYRINGE
- THUMB RING



Septodont



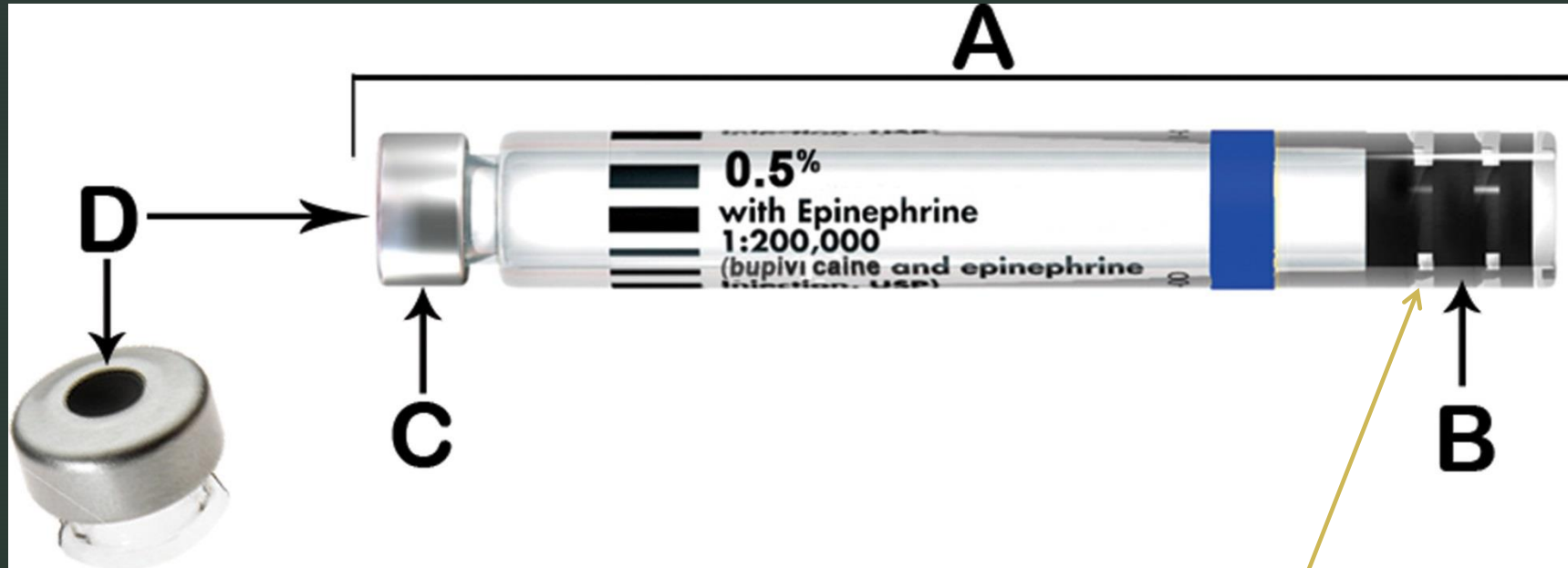
Miltek Grip



# Dental Anesthetic Carpule



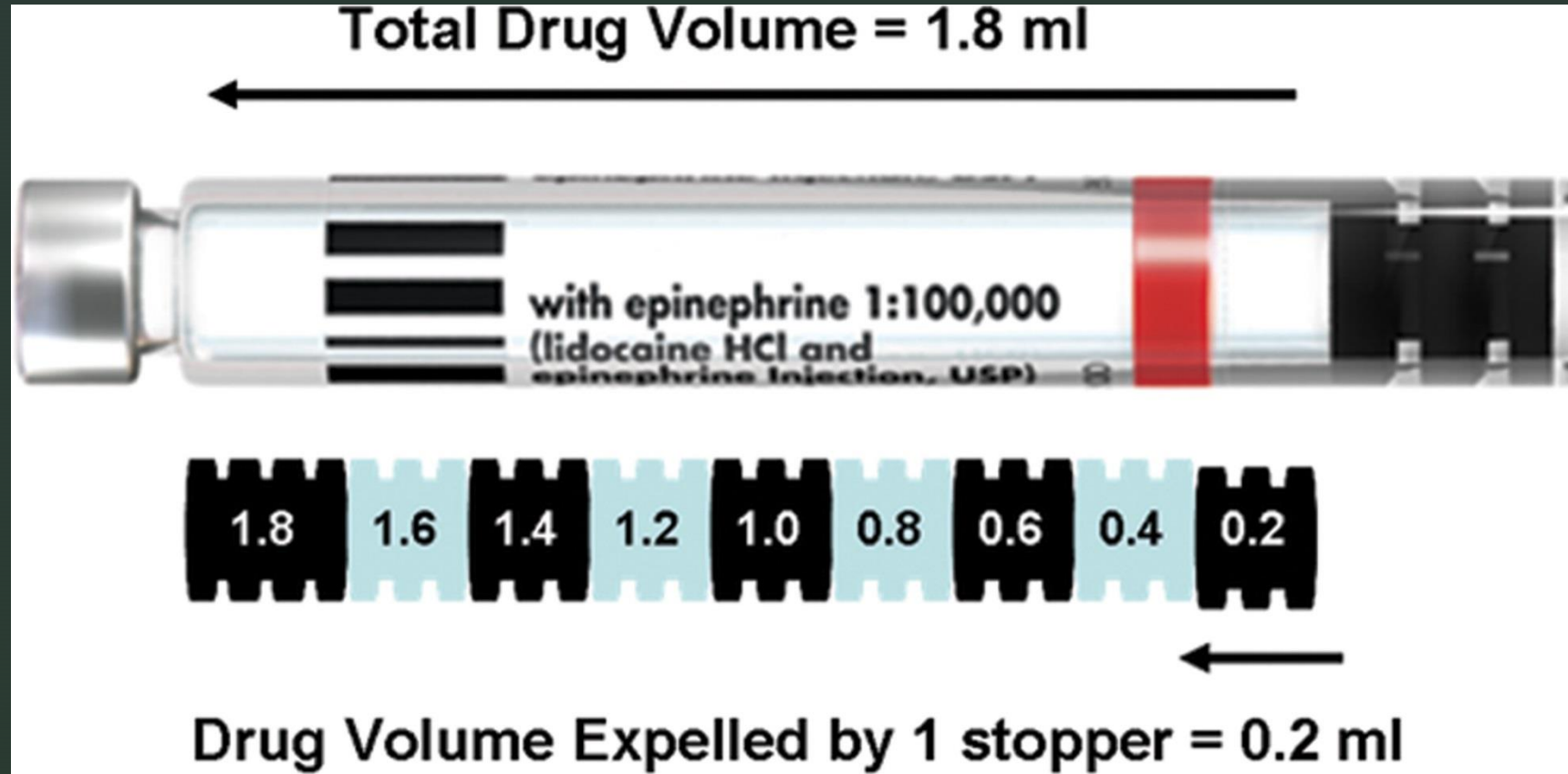
# Local Anesthetic Drug Carpule



- A= Glass cylinder
- B= Stopper
- C= Aluminum cap
- D =latex free diaphragm

The Harpoon of the syringe will engage the stopper (B) of the dental carpule

# Local Anesthetic Drug Carpule Volume



Most manufacturers produce a cartridge that contains 1.8 ml some are 1.7ml

# Dental Cartridge Labeling

## Local Anesthetic Solution

Anesthesia Color Coding	
Anesthetic	Color
2% Lidocaine with epinephrine 1:100,000	Red
2% Lidocaine with epinephrine 1:50,000	Green
Lidocaine plain	Blue
Mepivacaine 2% with levonordefrin 1:20,000	Olive
Mepivacaine 3%	White
Prilocaine 4% with epinephrine 1:200,000	Yellow
Prilocaine 4%	Black
Bupivacaine 4% with epinephrine	Dark Blue
Articaine 4% with epinephrine	Tan



Shelf Life of Local Anesthetics: **24 months** if no vasoconstrictor  
**18 months** if have a vasoconstrictor.

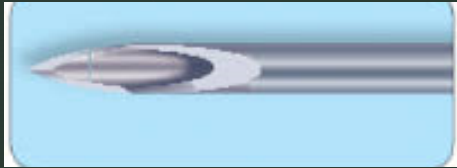
# Dental Anesthetic Cartridge Problems

1. Bubbles in the cartridge
2. Extruded Stopper
3. Sticky Stopper
4. Burning on injection
  - pH of the drug
  - Overheated cartridges (do not use cartridge warmers)
  - Expired cartridges
  - Cartridge contains disinfection solution
5. Corroded Cap
6. Rust on Cap
7. Leakage during injection
8. Cartridge broken
  - Due to excessive force during harpoon engagement
  - Breakage during shipping and handling

# Dental Needles

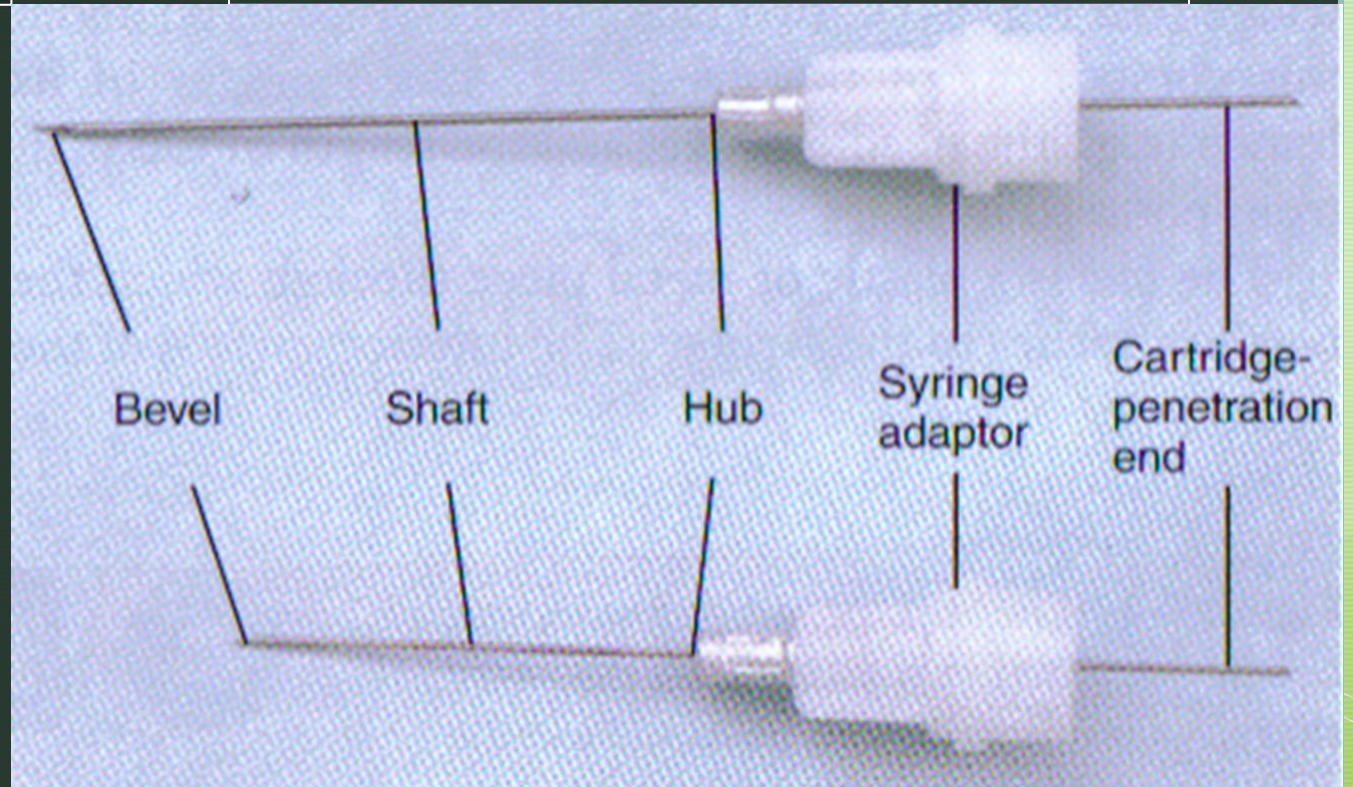
## Dental Needles:

- Sterile Stainless Steel
- Disposable
- Identified by **length & gauge** (gauge=lumen diameter)
- Beveled for ease of mucosal penetration

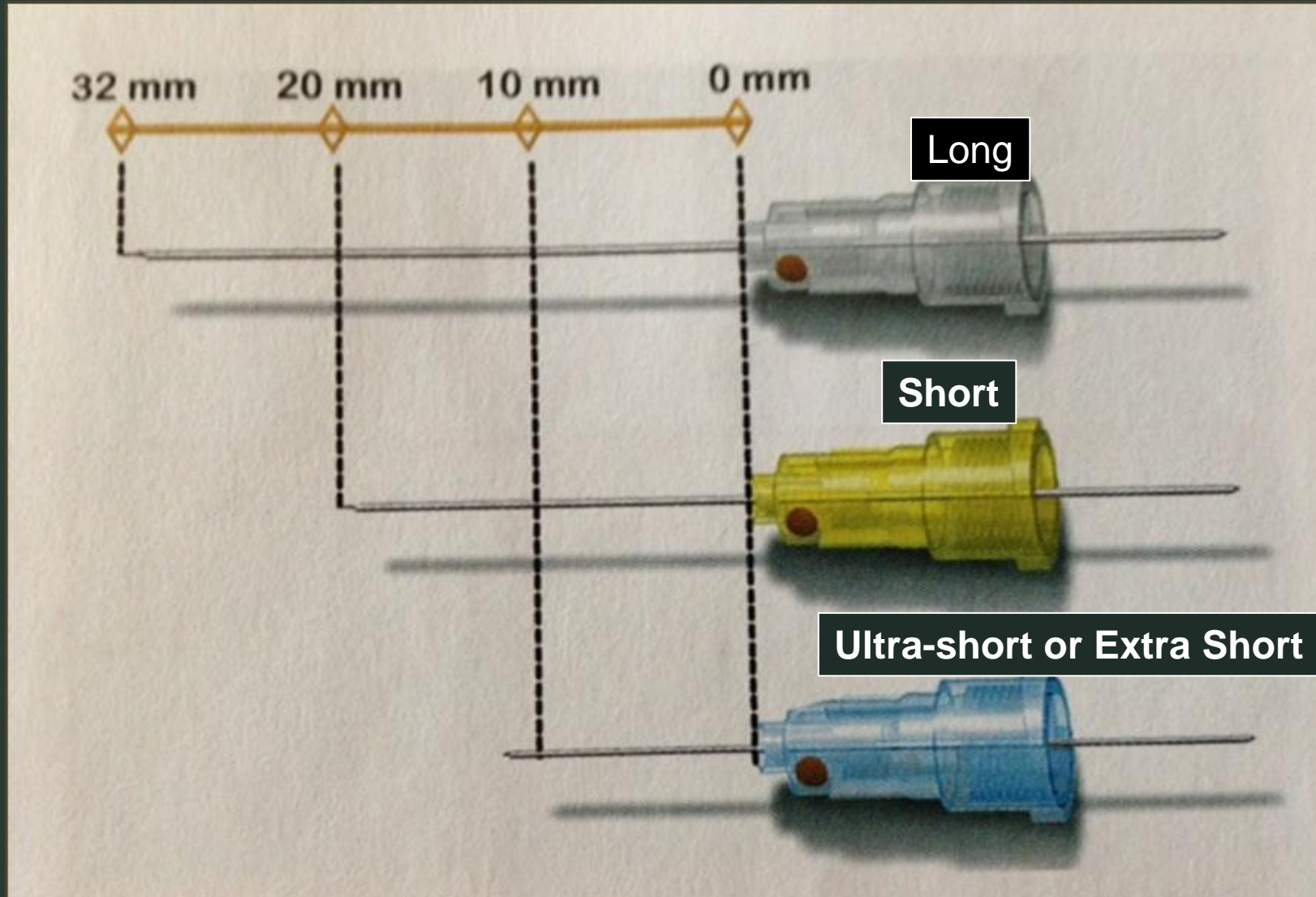


Remember the needle will become dull after 3 mucosal punctures.

## Components of Dental Needles



# Needle Lengths



**Short is the recommended length for Infiltration injections**

**Choice of needle length is related to depth of tissue penetration.**

# Needle Diameter = Gauge

- the **smaller** the number the **greater** the diameter of the lumen  
For example:
  - 30-gauge needle has a smaller internal diameter than a 25-gauge needle

- Standard gauges used in Dentistry are:



diameter of lumen decreases

25

**27 (for RDH Needs)**

30 (sm diameter)



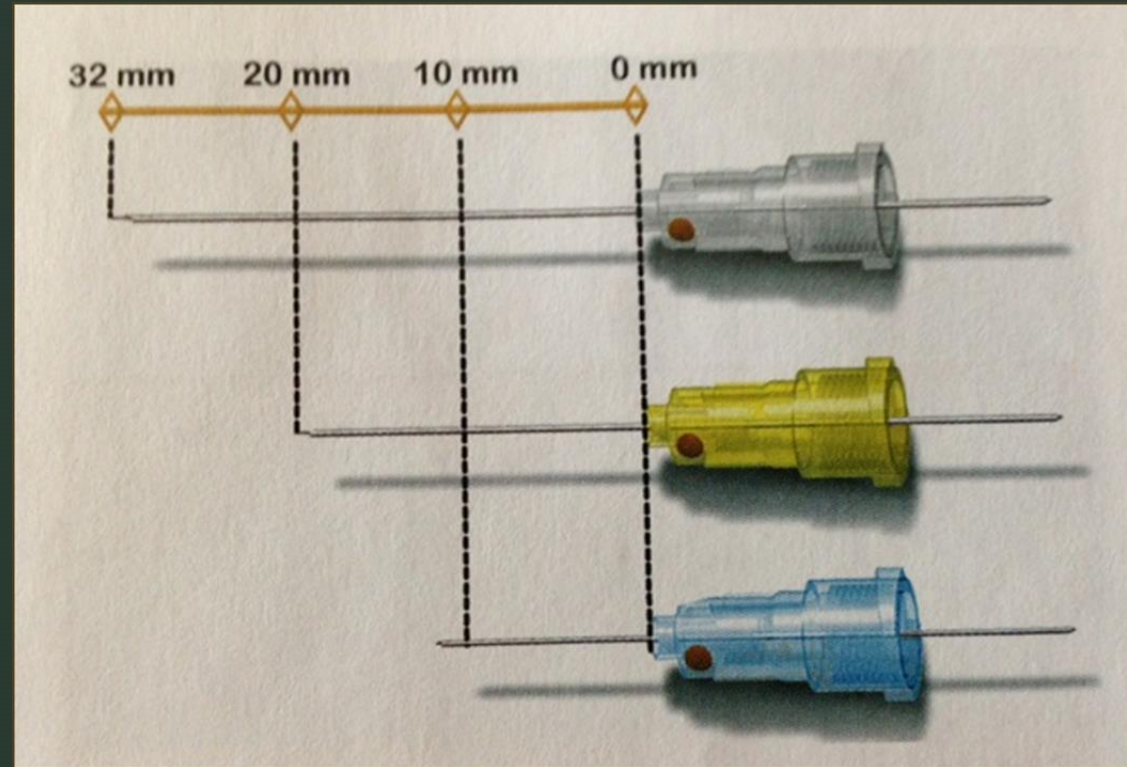


# Why is Needle Gauge important?

- Advantages of *larger* gauge (25) needles:
  1. less deflection of the needle tip as needle advances through the tissue which results in greater accuracy of location. (Mandibular Block (IA) Anesthesia )
  2. ↓ chance of needle breakage (separation)
  3. easier to see aspirated blood through the larger lumens
  4. for most of the injections that RDH perform in NYS a 27 gauge needle is recommended.

Your book however says 25 gauge (page 145)

# Bevel Indicators



Many manufactures indicate the opening of the needle lumen with a “Bevel” Marker . The “red” dot should facing the bone.

TABLE 6-5

**Recommended Needles for Injection Techniques**

Technique	Needle Gauge	Needle Length
Supraperiosteal (infiltration)	27	Short
Posterior superior alveolar nerve block	27*	Short*
Middle superior alveolar nerve block	27	Short
Anterior-middle superior alveolar nerve block (AMSA)	27	Short
Palatal approach (ASA)	30 <sup>†</sup>	Ultrashort
Buccal (long) nerve block	27 <sup>‡</sup>	Short <sup>‡</sup>
Infiltration for hemostasis	27	Short
Periodontal ligament injection (PDL or ILI)	27	Short
Intraseptal injection	27	Short
Intraosseous injection	27	Short
Intrapulpal injection	27	Short
Anterior superior alveolar nerve block (“infraorbital”)	25	Long
Maxillary (V <sub>2</sub> ) nerve block	25	Long
Inferior alveolar (“mandibular”) nerve block	25	Long
Gow-Gates mandibular nerve block	25	Long
Vazirani-Akinosi mandibular nerve block	25	Long

\*In earlier editions of this book, the 25-gauge long needle was recommended. As a means of minimizing the risk of hematoma after the posterior superior alveolar injection, a short needle is now recommended. If available, a 25-gauge short needle should be used; where this is not available, the 27-gauge short needle is recommended. (See Chapter 13 for additional discussion.)

<sup>†</sup>The authors of the P-ASA paper recommend use of 30-gauge ultrashort needle.<sup>17,18</sup>

<sup>‡</sup>In most clinical situations the 25-gauge long needle, used for the IANB, is used for the buccal nerve block, which is administered immediately after the IANB.

Needle Breakage is RARE when needles are used as per the manufacturer

# Prevention of Needle Breakage

**“Needle breakage during local anesthesia in the oral cavity--a retrospective of the last 50 years with guidelines for treatment and prevention.”** Augello M, von Jackowski J, Grätz KW, Jacobsen C.

Department of Oral and Craniomaxillofacial Surgery, University Hospital of Zurich, Frauenklinikstrasse 24, 8091 Zurich, Switzerland.  
[augello@gmx.ch](mailto:augello@gmx.ch)

“There are different possible reasons for needle breakage, with a main focus on preventable mistakes in treatment. In this study, an analysis of literature of the last 50 years as well as own cases has been performed to renew knowledge and prevention and therapy strategies for this serious complication. A systematic, multilingual review of medical literature from 1900 until today was conducted and information was evaluated systematically”

**In the majority of cases needle fracture** happened **during inferior alveolar nerve block**. It is mainly a problem due to inadequate technique or the use of improper gauge for the type of injection (inferior alveolar nerve block).

# Prevention of Needle Breakage

- Primary Cause of Breakage

Unexpected movement  
by the patient

## Secondary Causes of Breakage

- Inappropriate thickness of the needle (esp IAN)
- Bending the needle **-do not bend the needle**
- Redirection of needles once inserted into tissue
- Inappropriate length  
“Hubbing” the needle
- Forcing the needle against resistance
- Needle engaging the bone.

# How to assemble the syringe

- [https://youtu.be/h8LtpHI6S\\_s](https://youtu.be/h8LtpHI6S_s)

The technique to set up the syringe is correct  
Please watch how this video during the  
Demonstration of how to recap the needle, her first  
Technique is unsafe- see your textbook page 212  
and the 2<sup>nd</sup> recapping technique  
demonstrated is correct.



# Summary of Basic Steps for Loading the Dental Syringe pages 150 to 154 of your textbook

Select appropriate syringe, needle(s), cartridge(s), and recapping method.



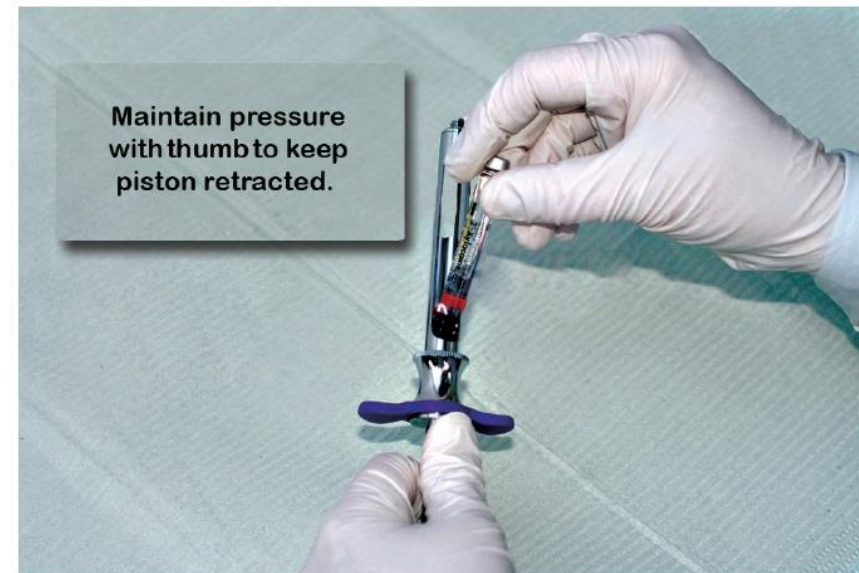
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1. Fully retract the piston to allow cartridge to slide into the barrel.



2. Insert the cartridge with the stopper toward the piston.

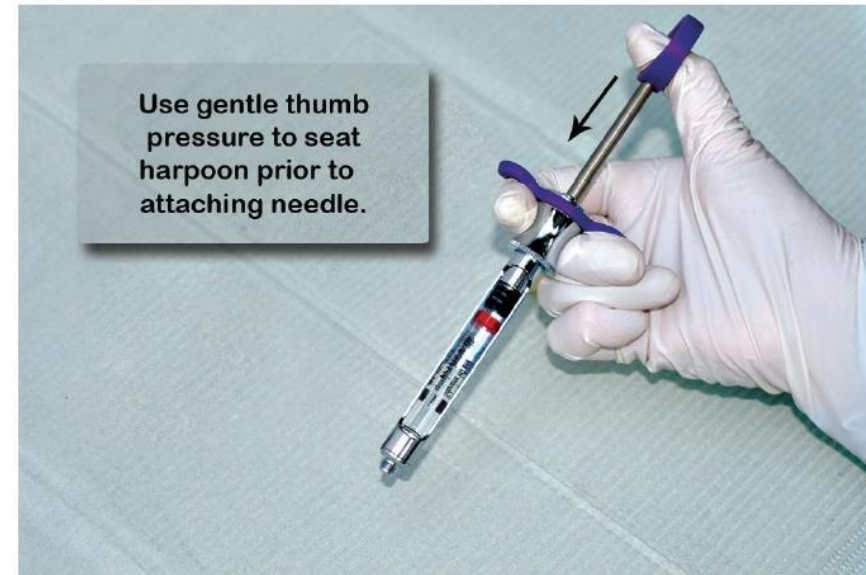


*continued on next slide*

3. Release the tension on the piston and confirm that the cartridge is fully seated.



4. Seat the harpoon securely into the stopper.



*continued on next slide*

5. Open the needle by gently turning the cap to break the seal.

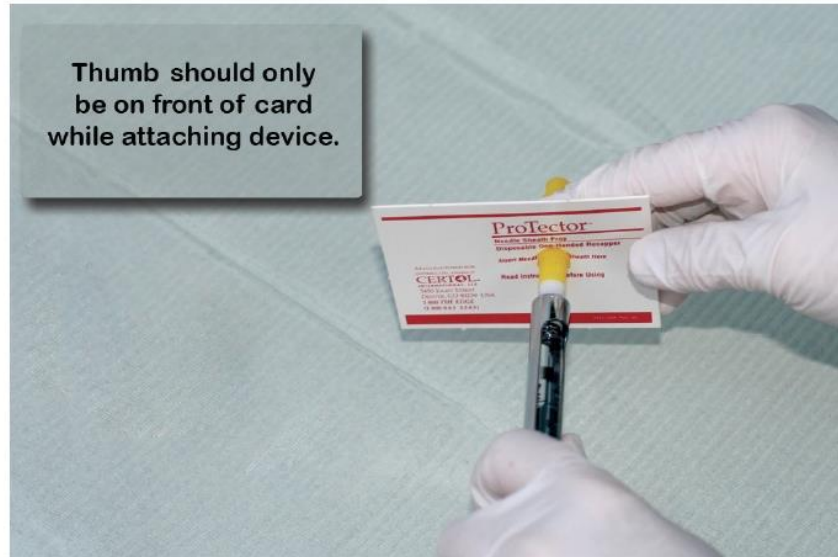


6. Screw the needle securely onto the needle adaptor.



*continued on next slide*

7. Prepare the needle recapping device (when applicable) if used.



8. Gently loosen and remove the cap to confirm bevel orientation and then orient the syringe for viewing of the large window.



*continued on next slide*

9. Safely replace the cap with a one-handed technique.



10. Orient the syringe facing down to achieve ease of retrieval with:
- a "palm up" grasp
  - large window visible



# Safety During Local Anesthesia Administration

# CDC Guidelines for Infection Control & Local Anesthesia

- Use standard precautions for all patients
- Consider sharp items that are contaminated with a patients' blood and saliva as potentially infective
- Establish a Post Exposure Protocol

- Establish Engineering & work place practices to prevent exposure to potentially infective body fluids

# Engineering & Work Place practices

- Place used disposable sharps in appropriate puncture resistant containers located as close as feasible to the treatment area.
- Do not bend or break needle
- Do not remove needles from the syringe until disposal time
- Never leave a needle unsheathed in the work area

- **Do not** recap needles by using both hands or any other technique that involves directing the point of the needle toward any body part.
- **Do:** Use either a one-handed scoop technique **or** a mechanical device designed for holding a needle cap when recapping needles.



Recapping the needle  
after the completion of  
the dental injection is  
an engineering control

### Note the *unsafe* practice

The thumb is on the front of the device. This device aids recapping by propping up the cap for ease of entry. It is NOT considered a barrier to needle penetration.



### Note the *unsafe* practice

Although the fingers are behind the card, this device is not puncture proof and is not intended for recapping in this manner. This practice can be used to uncap needles.



## SAFE

9. Safely replace the cap with a one-handed technique.



10. Orient the syringe facing down to achieve ease of retrieval with:
- a “palm up” grasp
  - large window visible

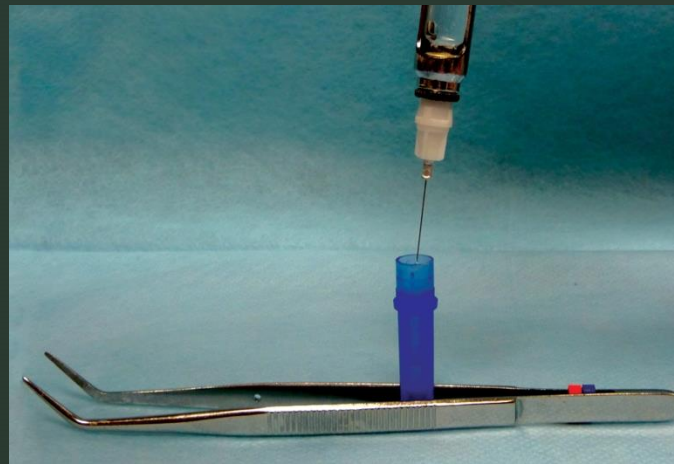
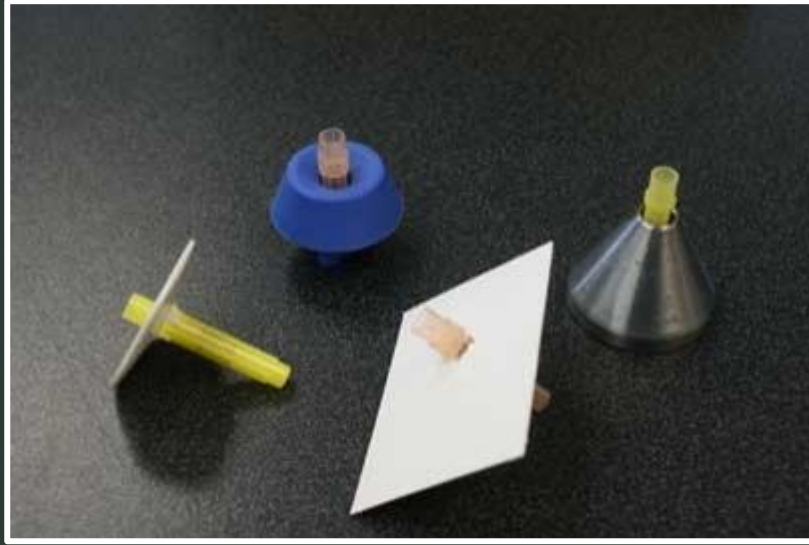


# One-Handed Scoop Technique

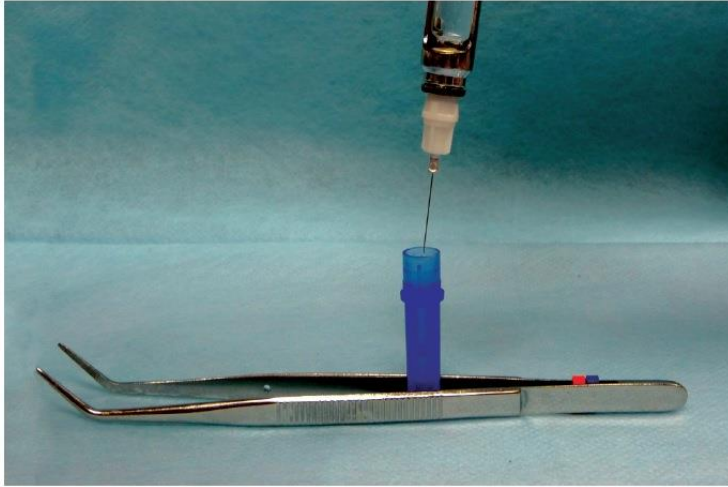


Images obtained from google images

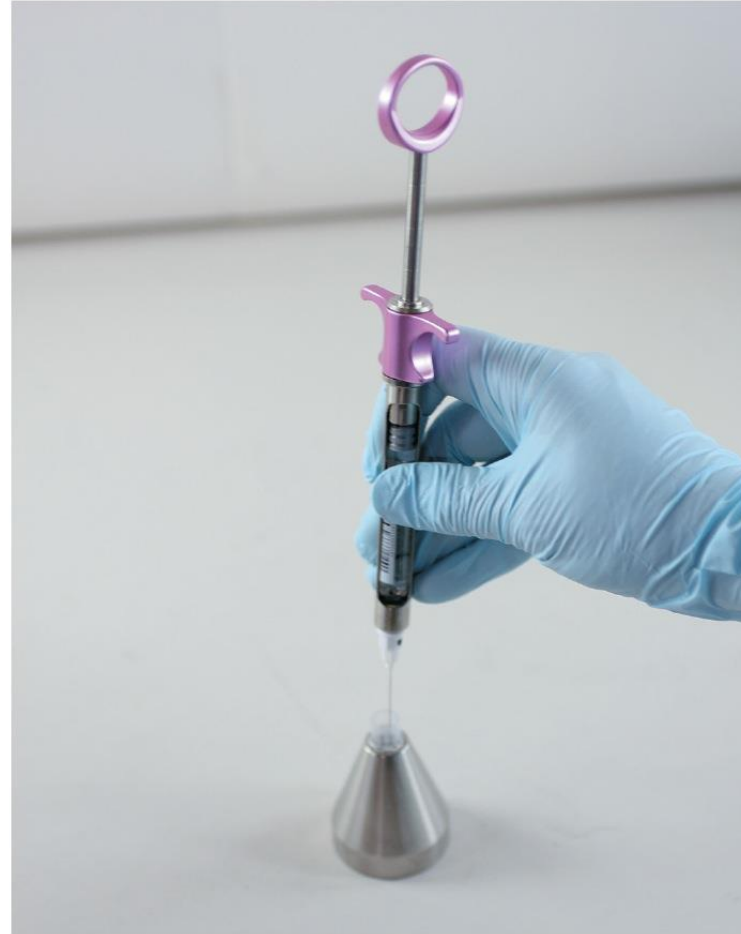
# Recapping devices



“Scoop” method *assisted* with cotton pliers as cap holder



“Scoop” method *assisted* with weighted cap holder



*continued on next slide*

# Recapping devices Used at CityTech

[Video](#)-Pro Tector Needle Sheath - How to Use

