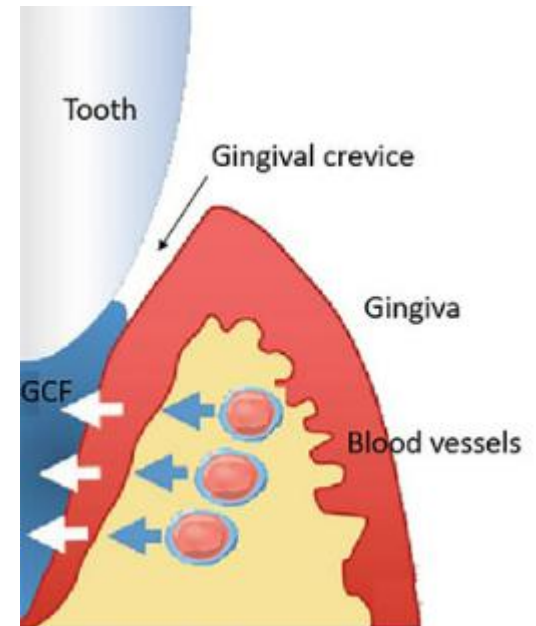


Anesthesia and Pain Control Moisture Control

Stephanie Bettis, BSDH, RDH, CDA

Introduction

- Anxiety and pain control
 - Practice of various psychological, physical, and chemical approaches to prevent and treat preoperative, operative, and postoperative anxiety and pain
- *Anesthesia* is the term used for temporary loss of feeling or sensation
- Water, Saliva, Gingival Crevicular Fluid, Blood



Gain Attention/Motivate



HAVE YOU EVER?

**Has anyone had a doctor's
appointment, of any kind, and felt
some anxiety or stress?**

By attending today's lecture:

You hold a vital responsibility to both your patients and the dentist in recognizing and implementing effective anxiety and stress reduction techniques for patient comfort. Additionally, you are expected to maintain a stable and controlled working environment within the oral cavity throughout the treatment process.

Learning Objectives:

1. Define anesthesia.
2. List the types of isolation used to decrease moisture during a dental procedure.
3. Summarize the different levels of pain control in dentistry.
4. Describe the dental dam and its role in isolation control.
5. Determine the composition and application of topical anesthetics.
6. Select the correct usage of inhalation sedation in dentistry.
7. Reflect on the importance of proper documentation for dental anesthetic procedures.

Anxiety, Fear, and Phobias

- **Triggers**
 - Needles
 - Drills
- **Signs and Symptoms**
 - Sweating
 - Tachycardia or Palpitations
 - Visible distress or crying
 - Withdrawal
 - Humor or aggression to mask anxiety
- **Causes**
 - Traumatic dental experience
 - Trauma - injury or abuse
 - General Anxiety, depression, PTSD
 - Personal Space
 - Not in control
 - Trust Issues
 - Agoraphobia, Claustrophobia, and OCD



Hints and Signs

Hints:

- Fidgeting
- Repetitive movements
- Awkwardly sitting
- Pacing
- Frequent changes in sitting positions
- Frequent visits to the restroom
- Rapid turning of magazine
- Startled to office noises

Signs:

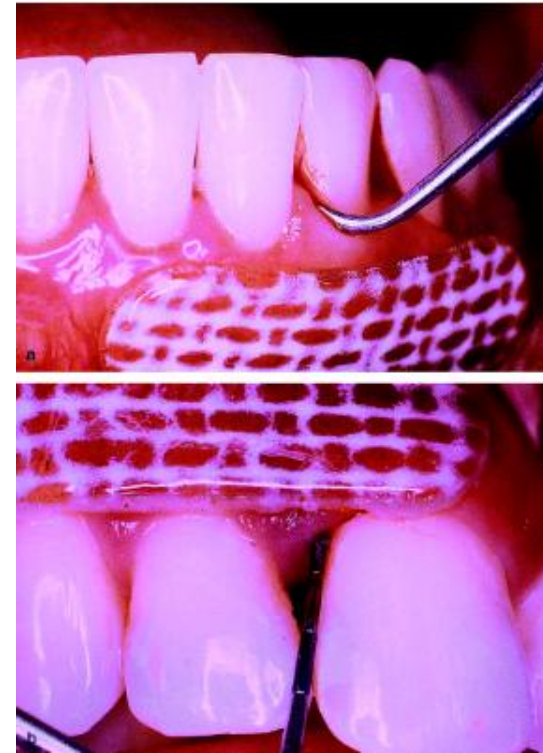
- One foot on the floor
- Constant movement
- Continuous turning away
- White knuckles
- Folding arms across chest
- Excessive chatter or silence
- Sighing
- Sweating
- Increase in breathing

Psychological Methods

- Patient Education
- Patient Control
- Modeling
- Distraction
- Relaxation
- Systematic Desensitization
- Biofeedback
- Hypnosis

Topical Anesthesia

- Provides a temporary numbing effect on nerve endings located on the surface of the oral mucosa
- Supplied as:
 - Ointments
 - Liquids
 - Sprays
 - Patches



ALL YOU NEED



Local Anesthesia

- Agent most frequently used for pain control in dentistry
- Safe, effective, and dependable method of anesthesia of suitable duration for virtually all forms of dental treatment



Characteristics of Local Anesthetics

- Non Irritating to the tissues in the area of the injection
- Associated with minimal toxicity
- Rapid onset
- Able to provide profound anesthesia
- Sufficient duration of action
- Completely reversible
- Sterile or capable of being sterilized by heat without deterioration

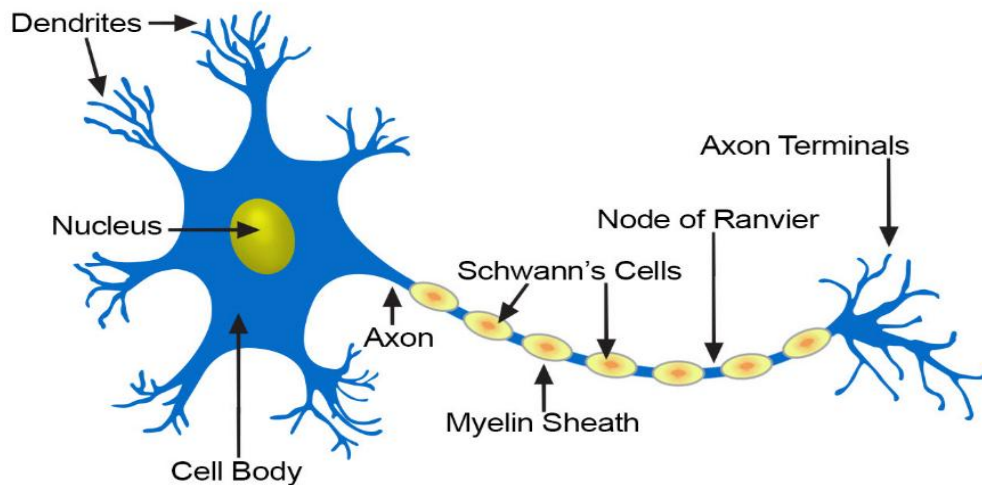
Chemical Composition of Anesthetics

- Two chemical groups
 - Ester-type anesthetic solutions: Used primarily as topical anesthetics
 - Amide local anesthetics: Metabolized by the liver
 - Excreted in the Urine
- Each cartridge contains:
 - Local anesthetic drug
 - Sodium chloride
 - Distilled water



Method of Action – Local Anesthesia

- Temporarily blocks the normal generation and conduction action of the nerve impulses
- Inject the anesthetic agent near the nerve in the area intended for dental treatment
- Induction time is the length of time from the injection of the anesthetic solution to complete and effective conduction blockage



Local Anesthetic Required:

- The dental care plan include manipulation of the patient's soft tissue or teeth are unduly sensitive
- Possible dentin or bone exposure and/or surgery
- For procedures such as gingival curettage, suture removal or removal of subgingival calculus (SRP)
- Treatment of areas of excessive hemorrhage

Time Span of Local Anesthetics

- Approximate time from induction to completion of the reversal process
 - Short-acting: 30 minutes
 - Intermediate: 60 minutes
 - Long-acting: 90 minutes
 - Bupivacaine
 - Etidocaine

Vasoconstrictors in Anesthetics

- Indications for use
 - Prolong the duration of an anesthetic agent by decreasing the blood flow in the immediate area of the injection
 - Decrease bleeding in the area during surgical procedures
- Types
 - Epinephrine
 - Levonordefrin
 - Neo-Cobefrin

Contraindications to Vasoconstrictors

- Unstable angina
- Recent myocardial infarction
- Recent coronary artery bypass surgery
- Untreated or uncontrolled severe hypertension
- Untreated or uncontrolled congestive heart failure

Commonly Used Dental Anesthetics with Vasoconstrictor

Formulation	Brand Name	Vasoconstrictor/Concentration
Articaine 4%	Septocaine	1:100,000 or 1:200,000 epinephrine
Bupivacaine 0.5%	Marcaine Sensorcaine	1:200,000 epinephrine
Lidocaine 2%	Daicaine Diocaine L-Caine Nervocaine Xylocaine Lidoject	1:50,000 and 1:100,000 epinephrine
Mepivacaine	Carbocaine 3% Carbocaine 2%	2% with levonordefrin 1:20,000
Prilocaine 4%	Citanest	1:200,000 epinephrine

QUESTION

WHAT IS ADDED TO A LOCAL ANESTHETIC TO PROLONG ITS EFFECT?

Injection Techniques

- The location and innervation of the tooth or teeth to be anesthetized will determine where topical anesthetic is placed and the type of injection given
 - Maxillary anesthesia
 - Palatal anesthesia
 - Mandibular anesthesia
 - Periodontal ligament injection

Maxilla Anesthesia



Maxilla

**Orbital
block**

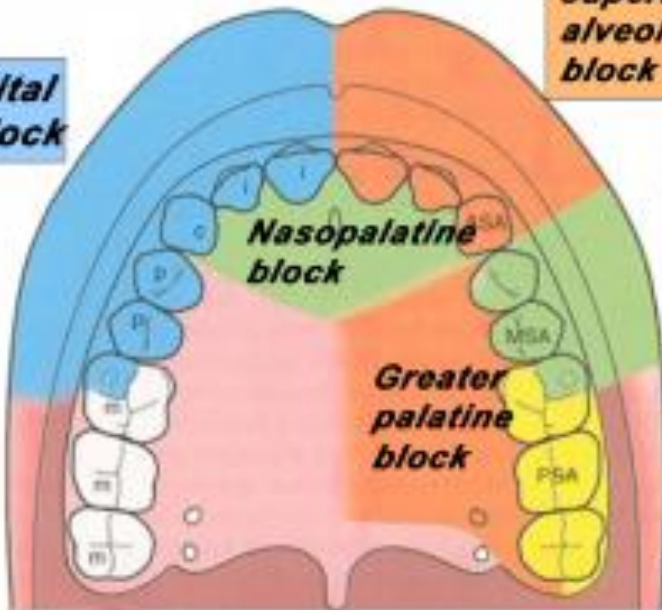
**Anterior
superior
alveolar
block**

**Nasopalatine
block**

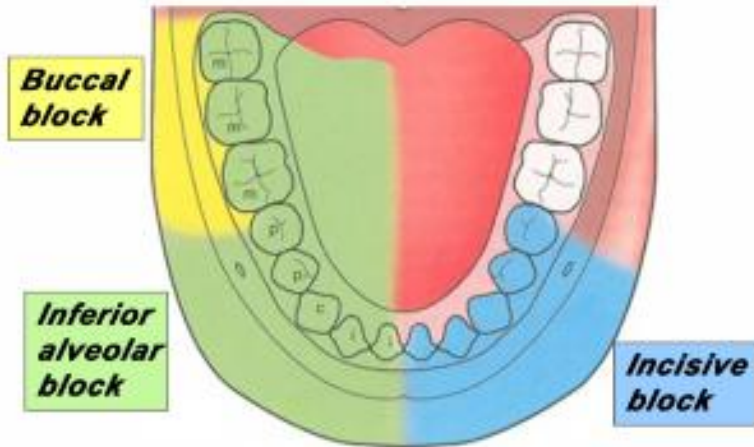
**Middle
superior
alveolar
block**

**Greater
palatine
block**

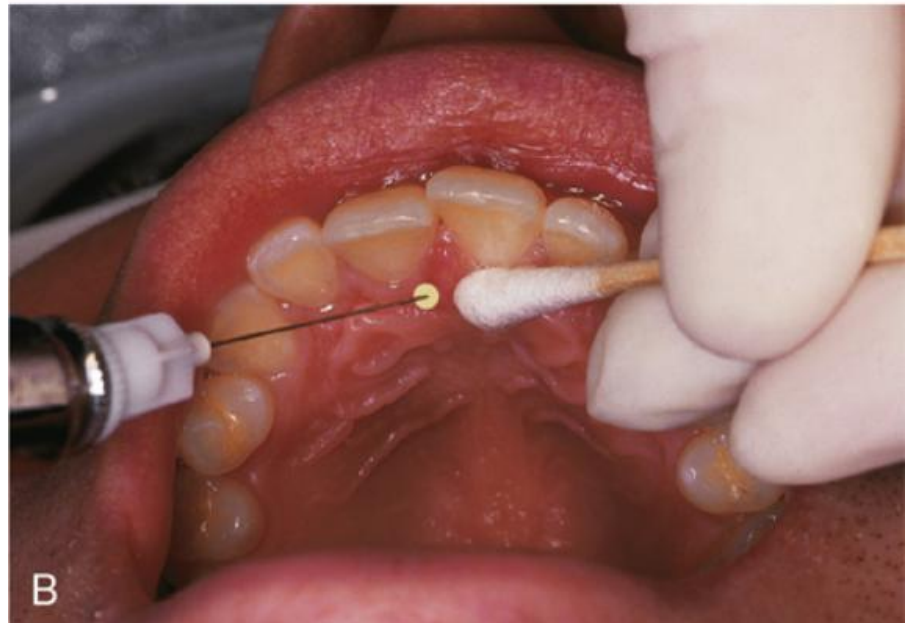
**Posterior
superior
alveolar
block**



Mandibular Anesthesia



PALATAL ANESTHESIA

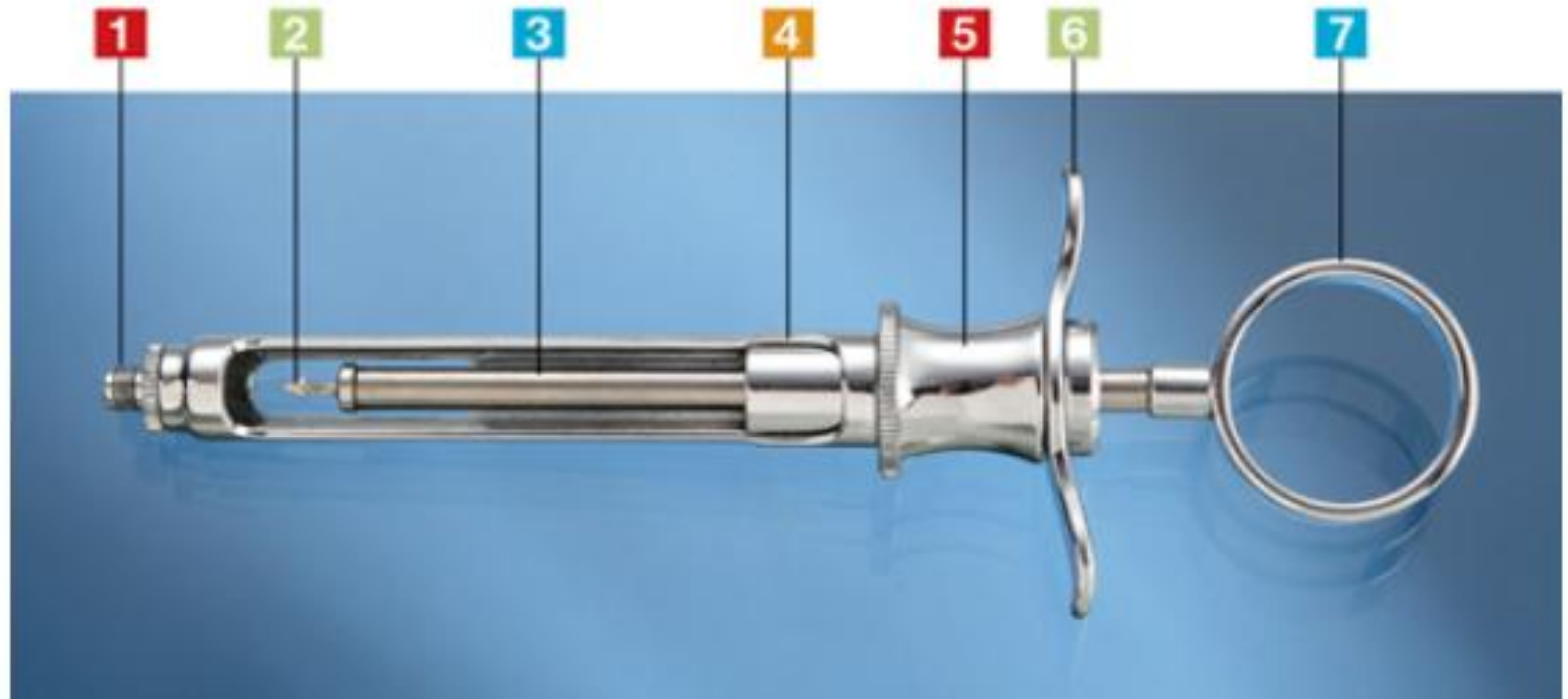


PERIODONTAL LIGAMENT INJECTION



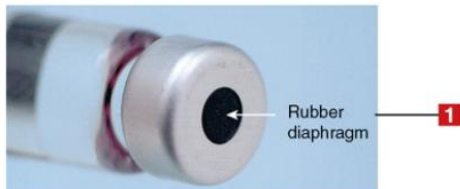
Local Anesthesia Setup

- Anesthetic syringe



Local Anesthesia Setup

- Anesthetic cartridges



PRODUCT	COLOR
Lidocaine 2% with epinephrine 1:100,000	Red
Lidocaine 2% with epinephrine 1:50,000	Green
Lidocaine 2% plain	Light Blue
Mepivacaine 2% with levonordefrin 1:20,000	Brown
Mepivacaine 3% plain	Light Orange
Prilocaine 4% with epinephrine 1:200,000	Yellow
Prilocaine 4% plain	Black
Bupivacaine 0.5% with epinephrine 1:200,000	Blue
Articaine 4% with epinephrine 1:100,000	Olive Green
Articaine 4% with epinephrine 1:200,000	Grey

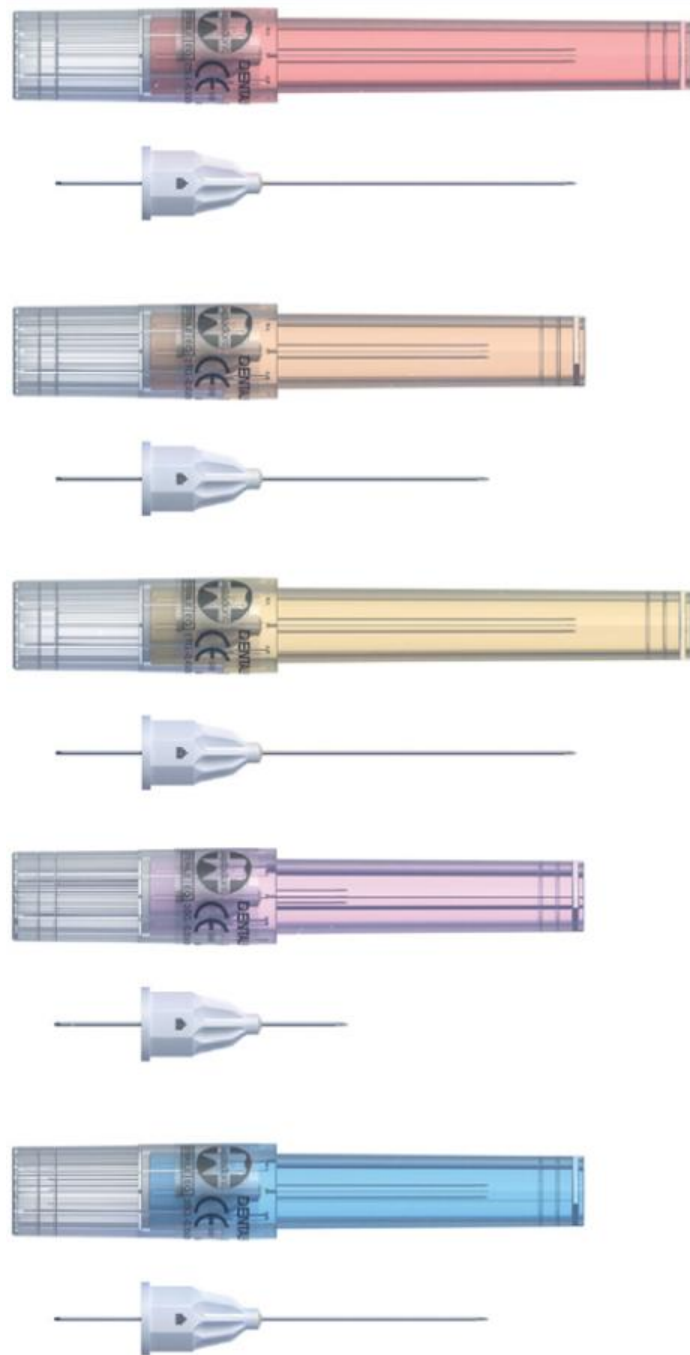
Guidelines for Handling Anesthetic Cartridges

- Cartridges should be stored at room temperature and protected from direct sunlight
- Never use a cartridge that has been frozen
- Do not use a cartridge if it is cracked, chipped, or damaged in any way
- Never use a solution that is discolored or cloudy or has passed the expiration date
- Do not leave the syringe preloaded with the needle attached for an extended period
- Never save a cartridge for reuse



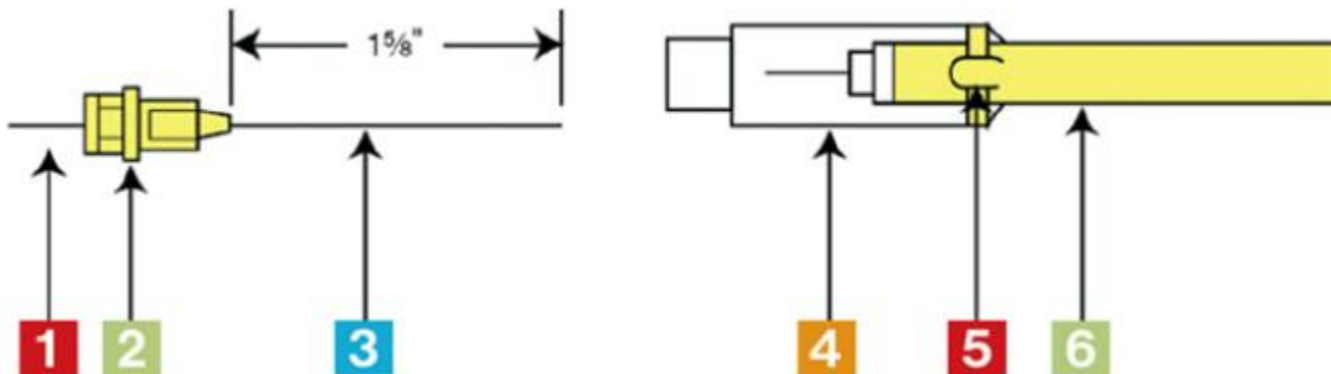
Local Anesthesia Setup

- Disposable needle



Disposable Needle

- Sterile needle used for injection is protected by a two-part plastic covering
- Cartridge end (shorter end)
- Needle hub
- Injection end (protected by needle guard)
- Lumen (hollow center of needle)
- Gauge (thickness/size of needle)



Complications and Precautions

- Injection into a blood vessel
- Infected areas
- Toxic reactions
 - Localized reactions - Sensitive Patients
 - Systemic reactions - CNS or Cardiovascular System
- Temporary numbness
- Paresthesia - Long-lasting numbness

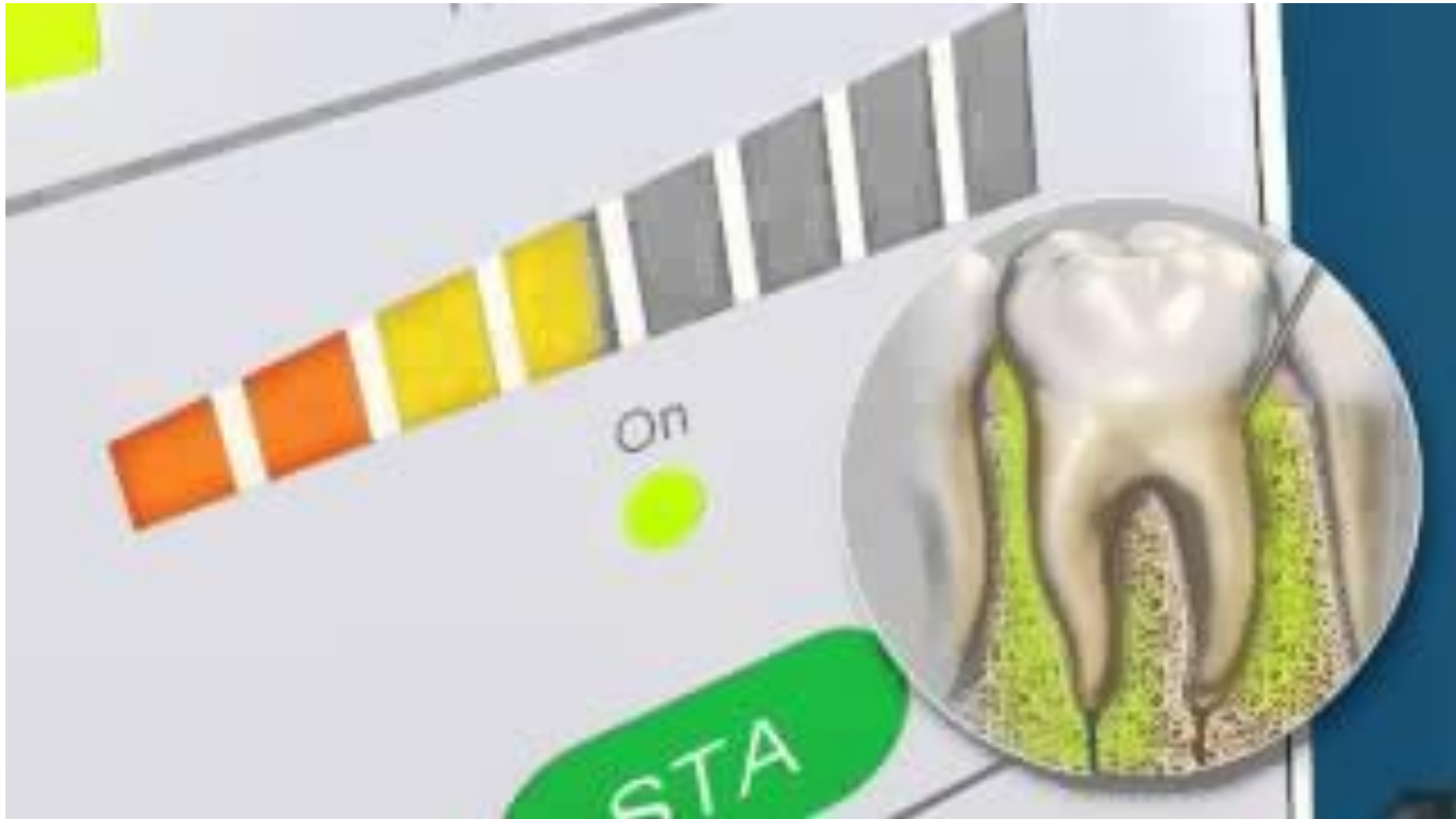
QUESTION

WHAT TYPE OF INJECTION
TECHNIQUE WILL THE DENTIST
FREQUENTLY USE TO ANESTHETIZE
TEETH #2 THROUGH #4?

Alternative Methods of Local Anesthesia

- Electronic anesthesia
- Computer-controlled anesthesia

THE WAND C-CLAD



How to Set-Up

Here are the steps of the Local Anesthesia Syringe Set-up:

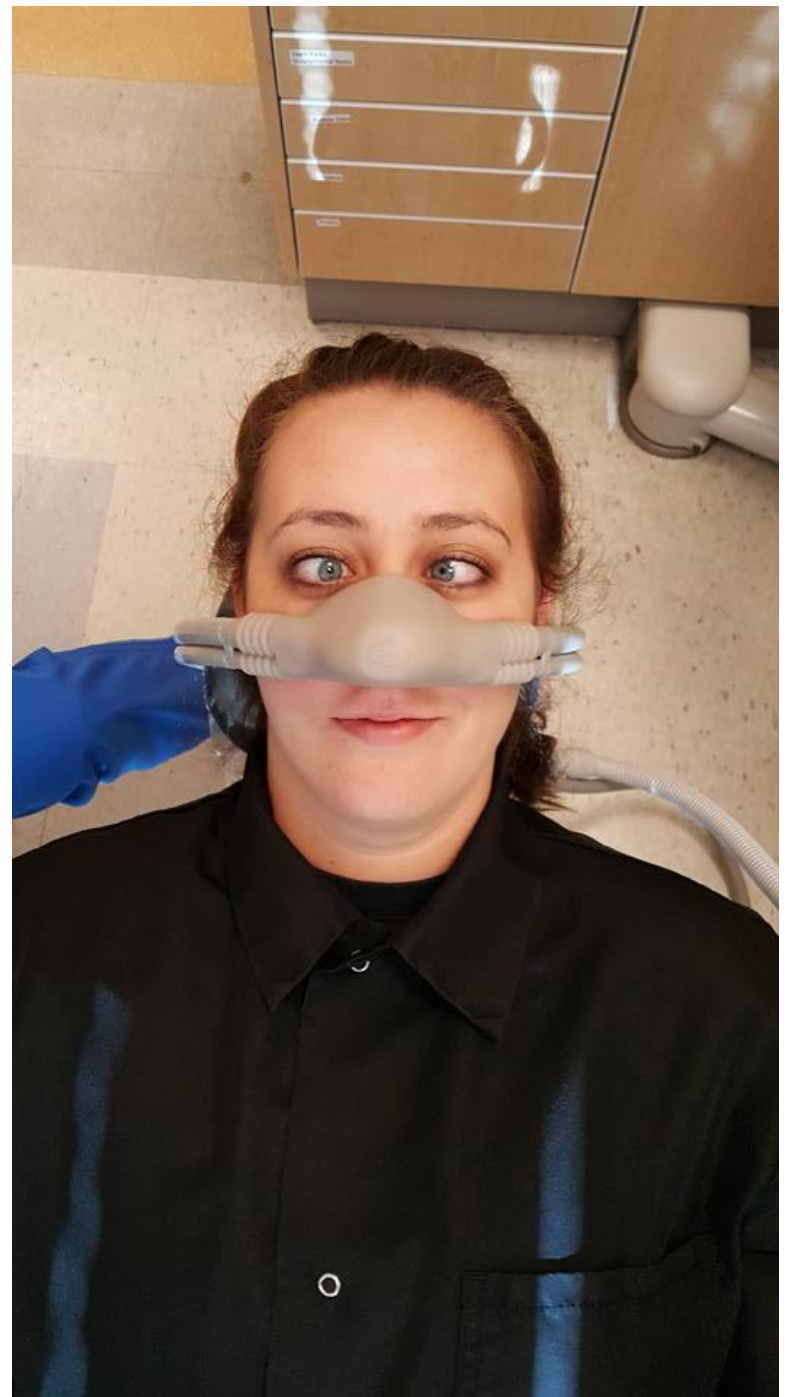
1. Gather your armamentarium - Cartridge, Syringe, and Needle.
2. Retract the harpoon fully.
3. Insert the cartridge into the syringe.
4. Engage the harpoon.
 - a. Give it two firm hits on the palm of your hand
 - b. Place your thumb on the cartridge and turn the ring of the harpoon 90 degrees.
5. Take the plastic part of the needle, leave the color cap on.
6. Attach the needle to the syringe.
7. Place the syringe in the rubber stopper/safety card.
 - a. Sometimes if the color top is see-thru, you can see the drips come out of the needle without taking the cap off.
8. Remove the cap to make sure you see a solution come out of the top of the needle.
9. Recap the needle.
10. You are ready to get the dentist to anesthetize.

Break-Down the Syringe

Here are the steps of the Local Anesthesia Syringe Break down:

1. Put your thumb on cartridge.
2. Take your index finger and start to rotate the harpoon as you are pulling it towards you.
 - a. This will help the harpoon not pull out the rubber stopper of the syringe.
3. Take out the cartridge
4. Take the capped needle and twist off.
5. Bend the needle to the side and take off the cap.
 - a. By bending the needle to the side, before taking off, will be an L shape to avoid the cap coming off and a potential stick in the finger.
 - b. If you pull it off straight, sometimes the cap can come off and stick the finger.
6. Put the needle/cartridge into the sharp container right away.
7. Place the syringe to be sterilization.

INHALATION SEDATION:
NITROUS OXIDE
“LAUGHING GAS”



Inhalation Sedation

- Nitrous oxide/oxygen (N₂O/O₂)
 - Combination of gases inhaled to help eliminate fear and to aid relaxation
- Effects
 - Non Addictive
 - Onset is easy, side effects are minimal, and recovery is rapid
 - Produces stage I anesthesia
 - Dulls the perception of pain

Advantages of N₂O Use

- Administration is simple and easily managed
- The services of an anesthetist or other special personnel are not required
- Excellent safety record
- Side effects are minimal
- The patient is awake
- Recovery is rapid
- Can be used with patients of all ages

Disadvantages of N₂O/O₂ Use

- Some patients may experience nausea or vertigo
- Patients who have behavioral problems may react in a negative way and act out those behavior issues

Medical Considerations to N₂O Use

- Contraindicated for:
 - COPD: interfere with stimulus to breathe
 - Cardiac diseases: can increase artery pressure
 - Pregnancy: First trimester
 - Upper respiratory infection: Problems inhaling through the nose
 - Psychiatric disorders and drug dependency: can cause hallucination
 - Middle ear disturbance: increased pressure
 - Critically ill patients: can cause B12 deficiency/anemia

Equipment of Nitrous Oxide System

(Slide 1 of 2)

- Cylinders
 - Gases are dispensed from steel cylinders, which are colored _____ for O_2 and _____ for N_2O
- N_2O machines are portable or part of the dental unit
 - Control valves control the flow of each gas
 - A flow meter indicates the rate of flow of the gases
 - The two gases are combined in a reservoir bag, which the patient draws on for breathing

Nitrous Oxide Unit



Equipment of Nitrous Oxide System

(Slide 2 of 2)

- Gas hose
 - Carries the gases from the reservoir bag to the mask or nosepiece
- Masks
 - Supplied in sizes for adults and children
 - The nosepiece through which the patient breathes the gases



Patient Assessment and Monitoring

- Always review the patient's medical history before administering N₂O/O₂ analgesia
 - The sedative effects of N₂O/O₂ may enhance the effects of medications directly or indirectly
- Obtain vital signs of blood pressure, pulse, and respiration before, during, and after administration
 - Preoperative readings provide a baseline
 - Postoperative readings are used to confirm the patient's recovery or to identify adverse responses



Patient Education for Inhalation Sedation

- Describe the procedure of administering the gases
- Describe the use of the mask and the importance of nasal breathing
- Describe the sensations that the patient will experience
- Reassure the patient

Administration

- Start with pure oxygen while establishing the patient's tidal volume
- Slowly titrate the nitrous oxide until the desired results are achieved
- The patient should refrain from talking or mouth-breathing
- The N₂O/O₂ analgesia should end with the administration of 100% O₂ for 3 to 5 minutes
- Obtain postoperative vital signs and compare them with the preoperative recordings

Safety Work Practices for the Clinical Team

- Used only for patient treatment
 - Never administered for recreational purposes
- Reducing N₂O hazards to dental personnel
 - Use a scavenger system
 - Use a patient mask that fits well
 - Discourage the patient from talking
 - Vent gas outside the building
 - Routinely inspect equipment and hoses for leaks
 - Use a monitoring badge system to detect N₂O

QUESTION

- Why is it important to discuss with patients the steps in the administration of nitrous oxide, as well as what they may expect from the dental procedure itself, before beginning a procedure?

Antianxiety Agents

- Sedatives are the drug of choice for physicians and dentists seeking to relieve anxiety in their patients
- Criteria for use
 - A patient is very nervous about a procedure
 - A procedure is long or difficult
 - The patient is mentally challenged
 - The patient is a very young child requiring extensive treatment

Intravenous (IV) Sedation

- Antianxiety drugs administered by IV throughout a procedure at a slower pace, providing a deeper stage I analgesia
- Physiologic measurements are recorded every 15 minutes
 - Level of consciousness
 - Respiratory function
 - Oximetry
 - Blood pressure
 - Heart rate
 - Cardiac rhythm

General Anesthesia

- A controlled state of unconsciousness with a loss of protective reflexes that produces stage III general anesthesia
- Pharmacologic makeup
 - Combination of gases
 - N₂O/O₂
 - Halothane or enflurane mixture
 - IV agents such as thiopental sodium and methohexital sodium

Four Stages of Anesthesia

(Slide 1 of 4)

- Stage I: Analgesia
- Stage II: Excitement
- Stage III: General Anesthesia
- Stage IV: Respiratory failure or cardiac arrest

Patient Preparation

- Preoperative physical examination
- Laboratory tests
- Signature of patient or legal guardian on a consent form

Patient Education

- The dentist will review the procedure as well as the risks
- The patient must not have anything to drink or eat 8 to 12 hours before undergoing general anesthesia

Patient Recovery

- Once the procedure is completed, the patient is monitored closely until normal reflexes return
- The patient should not be left alone while regaining consciousness

QUESTION

IS THE PATIENT CONSCIOUS DURING
GENERAL ANESTHESIA?

Mind-Body Medicine

- Methods of reducing anxiety and pain through different nonpharmacologic techniques
- Some common techniques include:
 - Distraction (e.g., listening to music, watching iPad)
 - Relaxation techniques
 - Guided techniques
 - Deep breathing
 - Biofeedback
 - Hypnosis
 - Acupuncture

Documentation of Anesthesia and Pain Control

- Always document the following measures and observations:
 - Review of the patient's medical history
 - Preoperative and postoperative vital signs
 - Patient's tidal volume if inhalation sedation is being used
 - Times at which anesthesia began and ended
 - Peak concentration administered
 - Postoperative time (in minutes) required for patient recovery
 - Adverse events and patient complaints

Local Anesthetic

- Date
- Amount of Anesthesia Administered
- Type and Concentration of anesthetic
- Type and concentration of vasoconstrictor
- Type of Injection
- Any Reaction
- Name of the Dental Practitioner administering the anesthetic.

SUMMARY

PATIENTS ARE HESITANT TO DISCUSS THEIR FEARS ABOUT DENTAL CARE. IT IS IMPORTANT FOR THE PATIENT TO BE AWARE OF THE TYPES OF PAIN AND ANXIETY CONTROL MEASURES THAT ARE AVAILABLE FOR THEM. GOOD COMMUNICATION AND RAPPORT IS KEY FOR YOUR PATIENTS TO FEEL INFORMED AND CONFIDENT ABOUT DENTAL CARE.

CRITICAL THINKING ACTIVITY

1. You are assisting in a restorative procedure. The dentist will be placing a permanent restoration in tooth #14. The dentist has indicated that a short-acting anesthetic agent is indicated. What is the time frame for a short-acting anesthetic agent?
2. Describe where the topical anesthetic is placed for tooth #14 and what type of injection the dentist will give for this procedure.
3. The dentist has completed giving the local anesthetic and transfers the syringe back to you. What is wrong with this scenario, and how do you handle it with the patient in the chair?
4. A 5-year-old child is scheduled to have a tooth restored with a stainless-steel crown. The patient record notes that there is pulpal damage, which means the tooth will require a more invasive procedure. The mother tells you that the child is very apprehensive about the visit. Describe additional anxiety and pain control measures that the dentist could prescribe in combination with local anesthesia.
5. A patient is scheduled to have her third molars extracted. What type of pain control might the surgeon select to prolong the anesthesia and decrease bleeding around the surgical site?
6. You are assisting in a procedure that includes the monitoring of N₂O/O₂ sedation. You check all the equipment and review the procedure with the patient. In the updated medical history, it is noted that the patient has been bothered with seasonal allergies. How will this affect the administration of N₂O?

Questions?

Isolation of Teeth

- Criteria for isolation techniques include the following:
 - Easy to apply
 - Protective of soft and hard tissues
 - Comfortable for the patient
 - Retraction provides better visualization for the operator
 - Prevention of moisture contamination
 - Isolation of the area of concern

Cotton Roll Isolation

- Advantages
 - Easy application
 - No additional equipment is required
 - Flexible, permitting adaptation to different areas of the mouth
- Disadvantages
 - Does not provide complete isolation
 - Does not protect the patient from aspiration
 - May stick to the oral mucosa
 - Must be replaced frequently because of saturation
 - Limited retraction



COTTON ROLL HOLDERS



Dry-Angle Isolation

- The dry-angle pad helps to isolate posterior areas in the maxillary and mandibular arches
 - The pad is placed over Stensen's duct, which extends from the parotid gland opposite the maxillary second molar
- These pads block the flow of saliva and protect the tissues in this area
 - Replace pads if they become soaked before the procedure has been completed

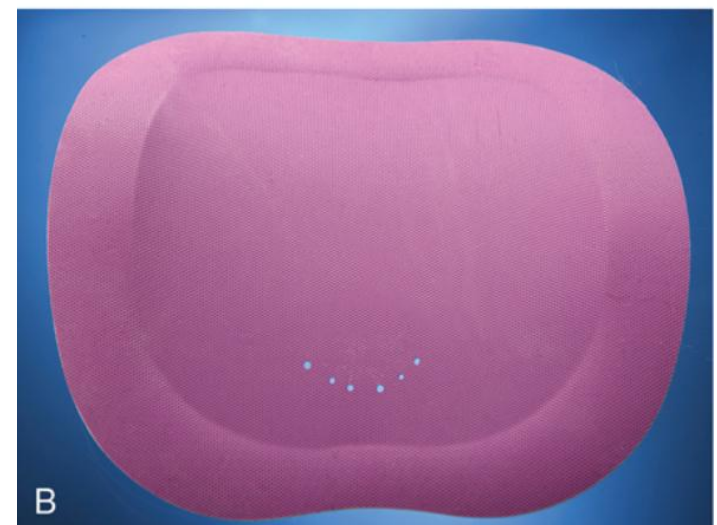


QUESTION

Why is it important to wet a cotton roll before removal from the mouth?

The Dental Dam

- A thin, stretchable latex (non latex) material that acts as a barrier when appropriately applied to selected teeth
- When the dam is in place, only selected teeth are visible through the dam



Dental Dam Indications for Use

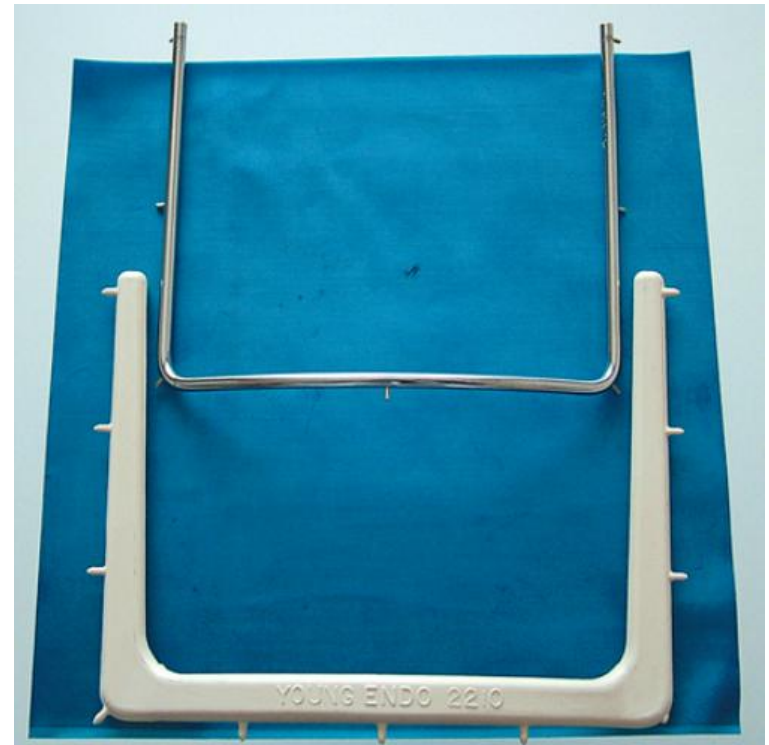
- Infection control barrier
- Safeguard for the patient's mouth
- Protection from accidental inhalation or swallowing of debris
- Protection from contamination for the tooth
- Moisture control device
- Tool with which to improve access
- Tool with which to improve visibility
- Tool with which to increase dental team efficiency

Dental Dam Material and Size

- Latex or latex-free material
- Two precut sizes (6×6 inches for adults and 5×5 inches for children)
- Available in a wide range of colors, from light to dark (dark is preferred because of the contrast)
- Available in various scents and flavors
- Three thicknesses (gauges)
 - Thin (light)
 - Medium
 - Heavy

Dental Dam Frame

- Stabilizes and stretches the dam so it fits tightly around the teeth and out of the operator's way
- Available in various plastic and metal frames
 - U-shaped frame
 - Young frame
 - Otsby frame

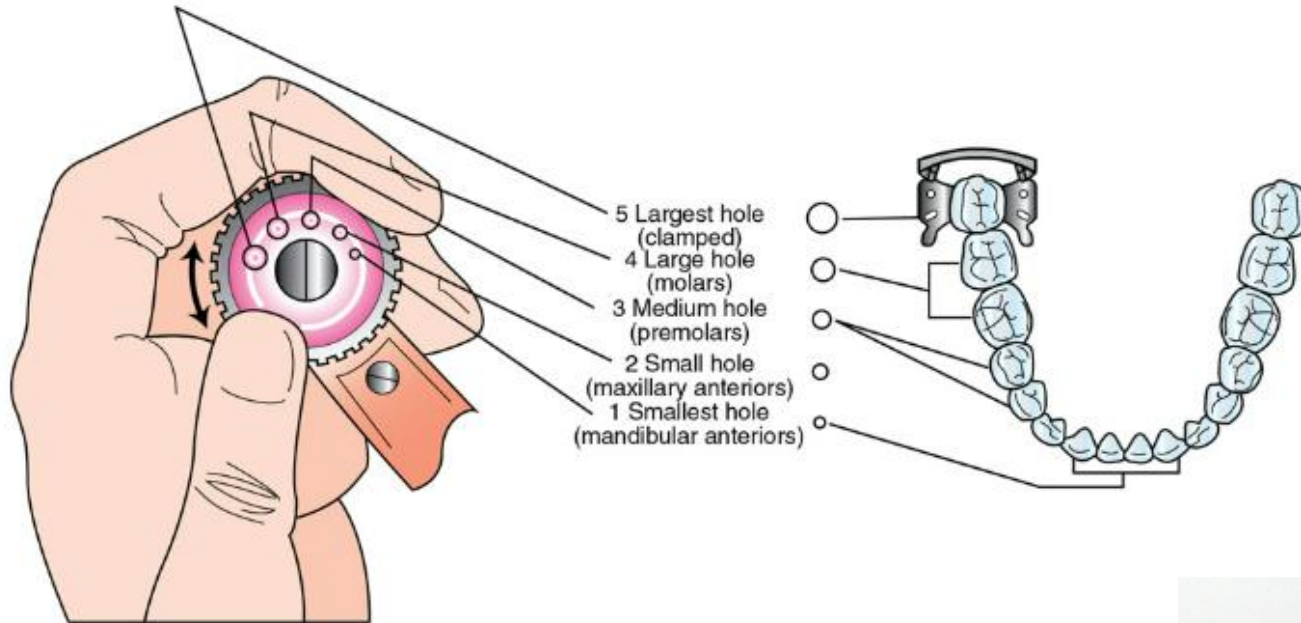


Dental Dam Materials and Accessories

- Dental Dam Napkin
- Lubricants
- Dental Dam Punch
- Dental Dam Stamp and Plate
- Dental Dam Forceps



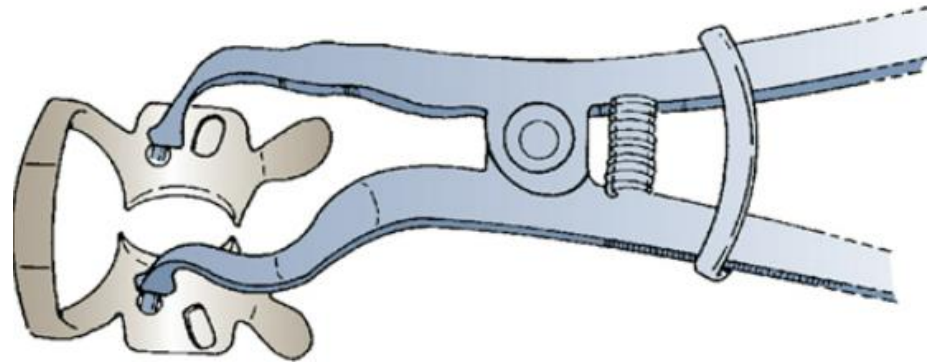
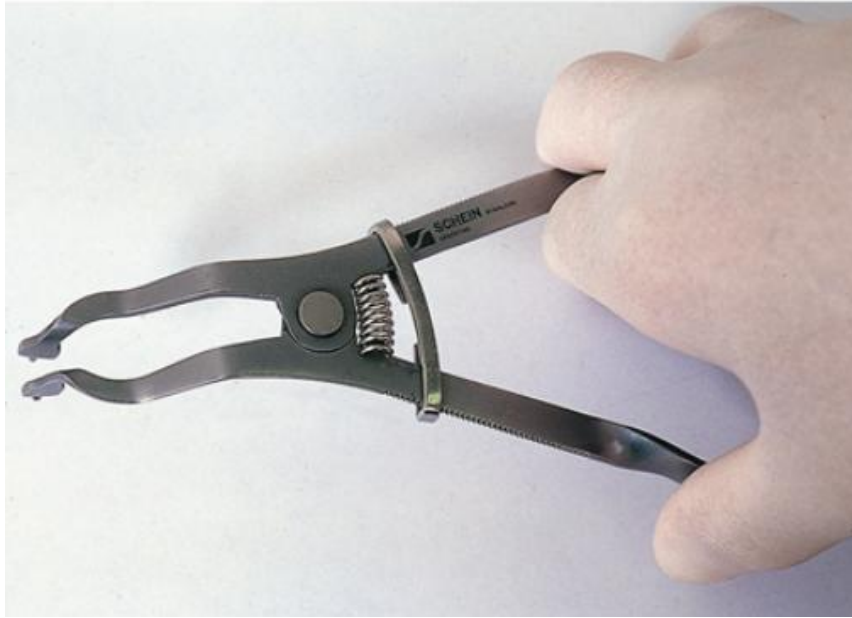
SIZE OF HOLES ON PUNCH PLATE



DENTAL DAM STAMP AND TEMPLATE

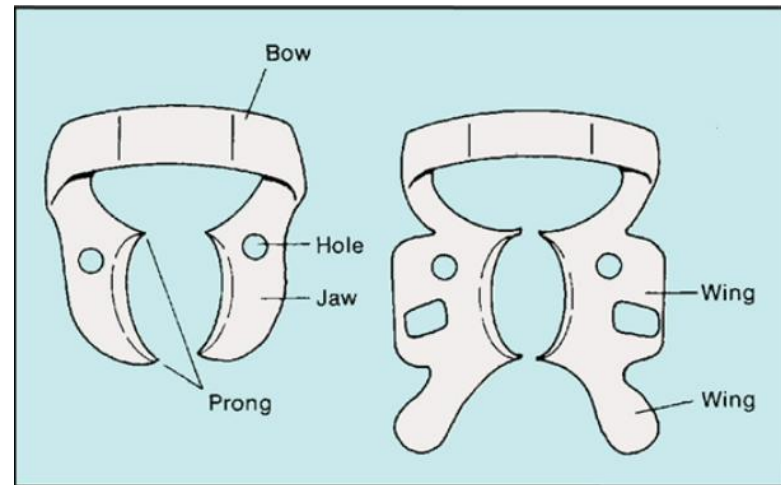


DENTAL DAM FORCEPS



Dental Dam Stabilizing Methods

- Dental Dam Clamp
- Parts of the clamp
 - Bow
 - Rounded portion of the clamp
 - Jaws
 - Prongs that seat around the tooth create the extension and balance necessary to stabilize the clamp
- Stabilizing Cord



ANTERIOR CLAMPS



W9



9

PREMOLAR CLAMPS



W00



00



W2



2

MOLAR CLAMPS



W7



7



W8



8



W14A



14A

LIGATURES ON CLAMPS



Dental Dam Application

- Factors to consider:
 - Maxillary or mandibular arch
 - Shape of the arch
 - Irregularities (missing teeth, fixed prosthesis, malpositioned teeth)
 - Teeth to be isolated
 - Identification of the anchor tooth; location of key punch hole
 - Size and spacing of the other holes to be punched

Dental Dam Placement and Removal

- Anterior teeth
 - A cervical or anterior clamp may be required if the gingival third of a tooth is to be restored and if the gingival tissue must be retracted for better exposure
- Stabilizing the cervical clamp
 - Softened stick compound may be used for this purpose
- Fixed bridge
 - Punch a hole for each fully crowned tooth, but do not punch holes for the teeth that are replacing missing teeth

QUESTION

What is used to stabilize and stretch the dam away from the tooth?

SUMMARY

The importance of moisture control is imperative for a procedure to be successful. It is the clinical assistant's responsibility to oversee this throughout a procedure.

Critical Thinking Activity

1. The dentist has requested that you place sealants on teeth #19 and #30. What isolation technique could you use for this procedure and why?
2. The dentist is preparing tooth #4 for a disto-occlusal amalgam. Where will you place the HVE tip during this procedure?
3. The dentist is halfway through preparing tooth #4 and pulls the handpiece out of the mouth to examine the extent of the remaining decay with the mirror and explorer. What would you do at this moment?
4. You will be assisting in a composite procedure on tooth #24. How will you punch the dental dam for this procedure?
5. What hole sizes would be punched for the isolation of teeth #18 through #22, with the anchor tooth being #18?

Questions?

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