LOCAL AND REGIONAL ANESTHESIA IN DENTISTRY

METHODS OF INDUCING LOCAL ANESTHESIA:

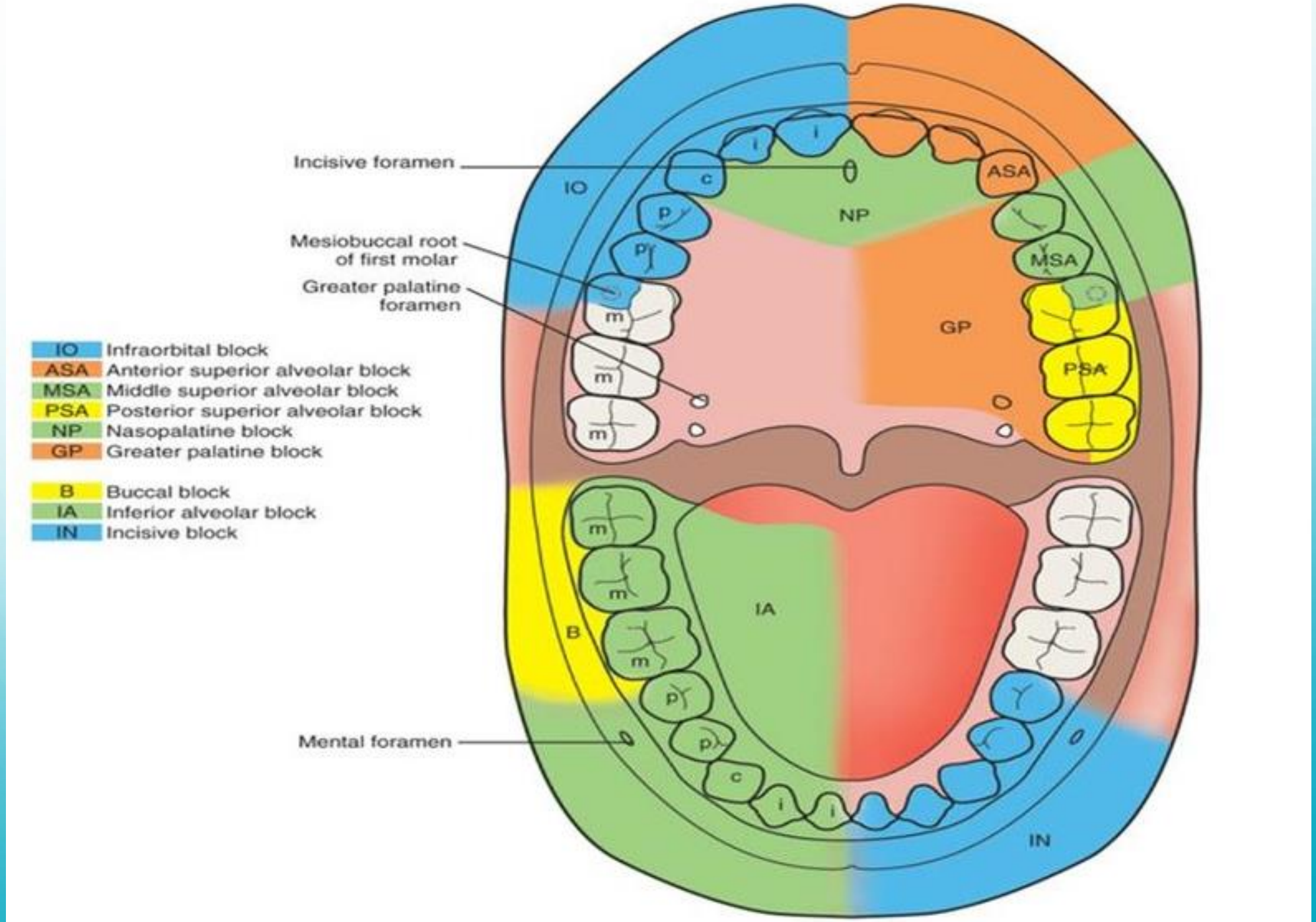
- Low temperature
- Mechanical trauma
- Anoxia
- Neurolytic agents such as alcohol & phenol
- Chemical agents such as local anesthetics

MAXILLARY :

- –**Posterior superior alveolar (PSA) nerve block** -several molar teeth in one quadrant
- –**Middle superior alveolar (MSA) nerve block** -premolars in one quadrant
- –**Anterior superior alveolar (ASA) nerve block**-anterior teeth in one quadrant
- –**Maxillary (V2, second division) nerve block** -extensive buccal, palatal, and pulpalmanagement in one quadrant
- **Greater (anterior) palatine nerve block** -palatal soft and osseous tissue treatment distal to the canine in one quadrant
- –**Nasopalatinenerve block**-palatal soft and osseous tissue management from canine to canine bilaterally
- –**Anterior middle superior alveolar (AMSA) nerve block** -anterior teeth, palatal and buccalsoft and hard tissues
- –**Palatal approach-anterior superior alveolar (P-ASA) nerve block**-anterior teeth and their palatal and facial soft and hard tissues

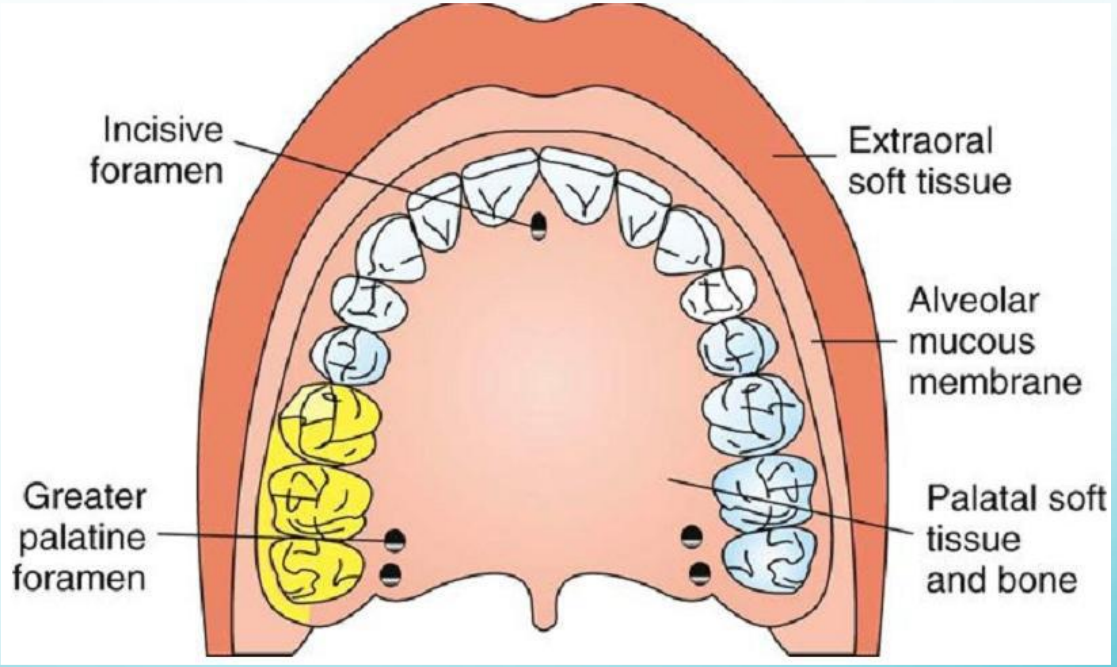
- **Maxillary Anesthesia: Acessory**
- •Supraperiosteal(infiltration)
- •Periodontal ligament (PDL, intraligamentary) injection
- •Intraseptalinjection
- •Intracrestalinjection,
- •Intraosseous(IO) injection

Tehnica	Anestezie
Maxilarul superior	
Anestezia la tuberozitate **Nervul alveolar superior posterior**	Molarii maxilei (cu excepția rădăcinii mezio-vestibulare a molarului 1 maxilar), de asemenea țesuturile dure și moi ale regiunii vestibulare corespunzătoare
Anestezia la foramen infraorbitar **Nervul alveolar superior anterior și Nervul alveolar superior mediu**	Caninul, incisivul lateral și lateral, cu țesuturile dure și moi din regiunea vestibulară corespunzătoare. Rădăcina mezio-vestibulară a molarului 1 superior, premolarii și țesuturile dure și moi din regiunea vestibulară corespunzătoare.
Anestezia la foramen palatin mare **Nervul palatin mare**	Mucoasa palatului și țesuturile dure de la primul premolar spre posterior, până la linia mediană a palatului.
Anestezia la foramen nazo-palatin **Nervul nazo-palatin**	Țesuturile dure și moi din regiunea palatinală de la canin la canin.


Incisive foramen
Mesiobuccal root of first molar
Greater palatine foramen
Mental foramen
IO Infraorbital block
ASA Anterior superior alveolar block
MSA Middle superior alveolar block
PSA Posterior superior alveolar block
NP Nasopalatine block
GP Greater palatine block
B Buccal block
IA Inferior alveolar block
IN Incisive block
IO
ASA
NP
MSA
GP
PSA
B
IA
IN

POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

- Commonly used dental nerve block
- Highly successful technique (>95%)
- •Other Common Names -**Tuberosityblock, zygomaticblock.**
- •**Areas Anesthetized**
- –**Pulps** of the **maxillary third, second, and first molars** (entire tooth = 72%; mesiobuccalroot of the maxillary first molar not anesthetized = 28%)
- –**Buccal periodontium**and bone overlying these teeth


Incisive foramen
Extraoral soft tissue
Alveolar mucous membrane
Greater palatine foramen
Palatal soft tissue and bone

POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Indications

- When treatment involves two or more maxillary molars
- When supraperiosteal injection is contraindicated (e.g., with infection or acute inflammation)
- When supraperiosteal injection has proved ineffective

Contraindication

- When the risk of hemorrhage is too great. Ex: hemophiliac patient

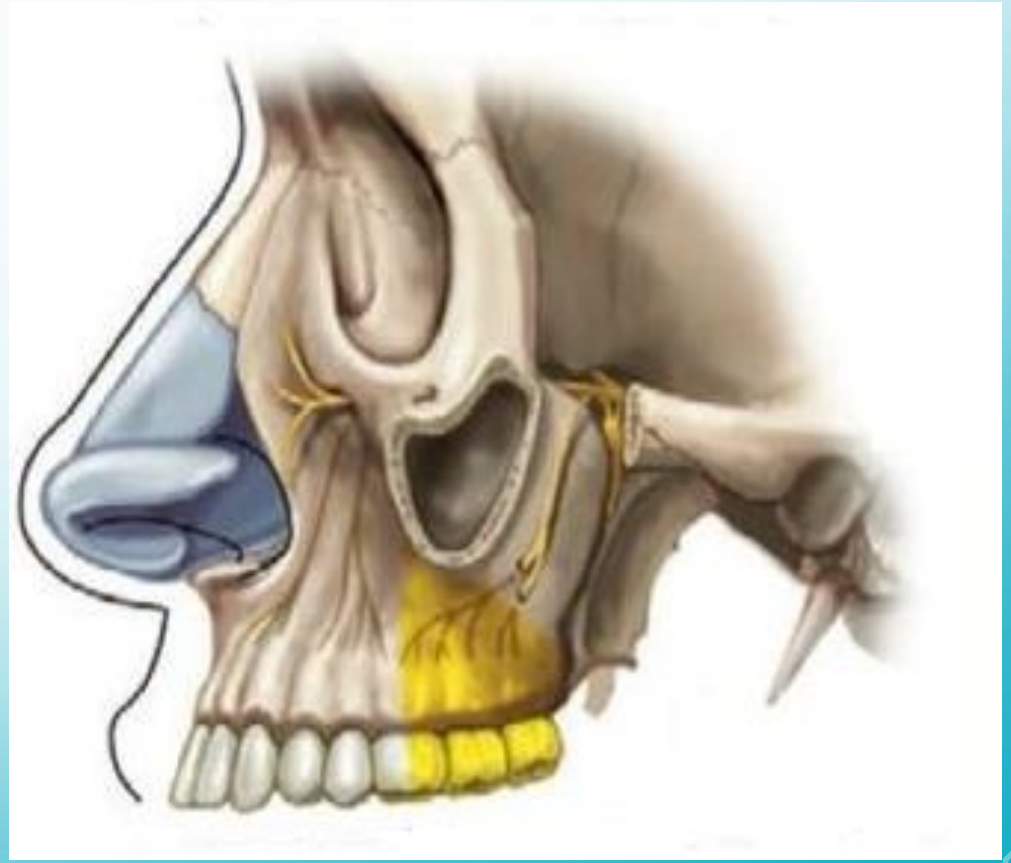
POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Advantages

- **Atraumatic:** relatively large area of soft tissue into which the local anesthetic is deposited and the fact that bone is not contacted
- **High success rate** (>95%)
- **Minimum number** of necessary injections (Minimizes the total volume of local anesthetic solution administered)

Disadvantages

- **Risk of hematoma,**
- **Technique somewhat arbitrary:** no bony landmarks during insertion
- Second injection necessary for treatment of the first molar (mesiobuccal root) in 28% of patients



POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

- **Positive Aspiration:** Approximately 3.1%.

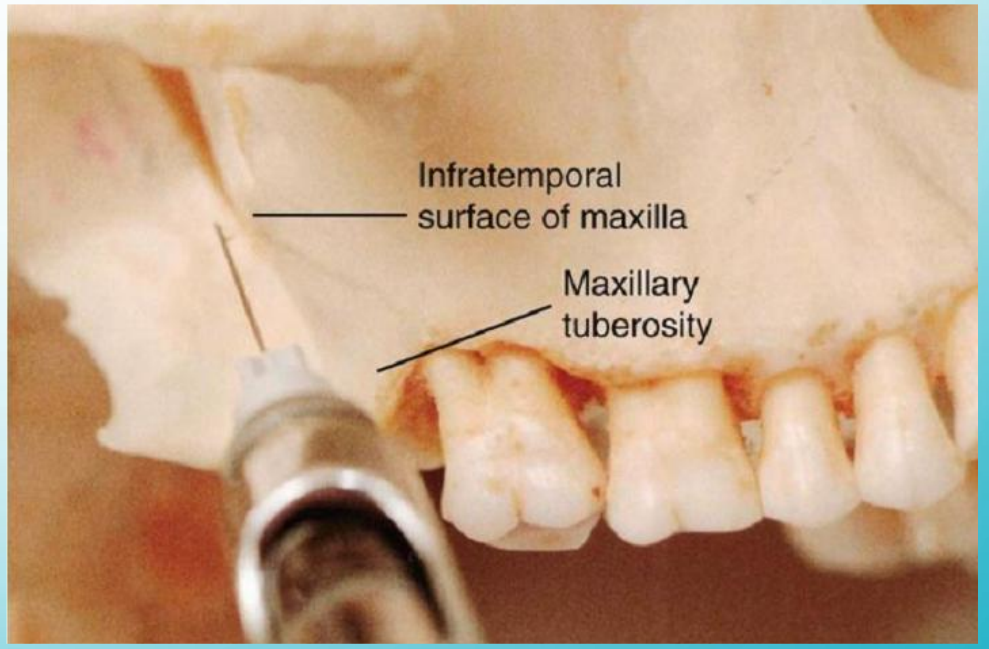
Alternatives

- **Supraperiosteal** or PDL injections for pulpal and root anesthesia
- **Infiltrations** for the buccal periodontium and hard tissues
- Maxillary nerve block

POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Technique

- A 27-gauge short needle recommended
- **Area of insertion:** height of the mucobuccal fold above the maxillary second molar
- **Target area:** PSA nerve—posterior, superior, and medial to the posterior border of the maxilla

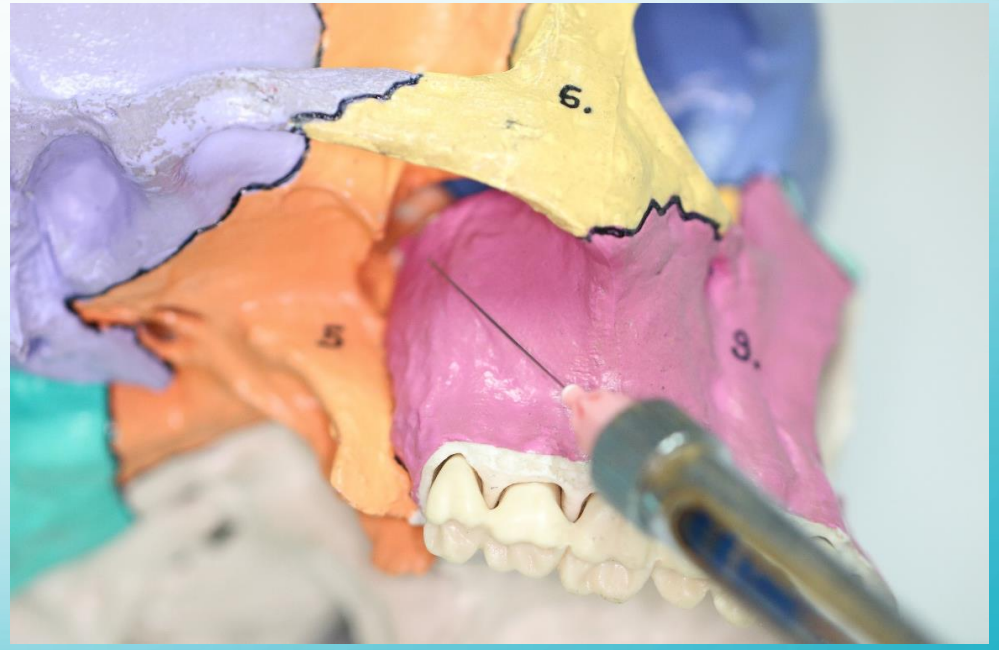


POSTERIOR SUPERIOR ALVEOLAR NERVE BLOCK TECHNIQUE

Landmarks

- Mucobuccal fold
- Maxillary tuberosity
- Zygomatic process of the maxilla

- **Orientation of the bevel**: toward bone during the injection. If bone is accidentally touched, the sensation is less unpleasant.



PROCEDURE

Operator position

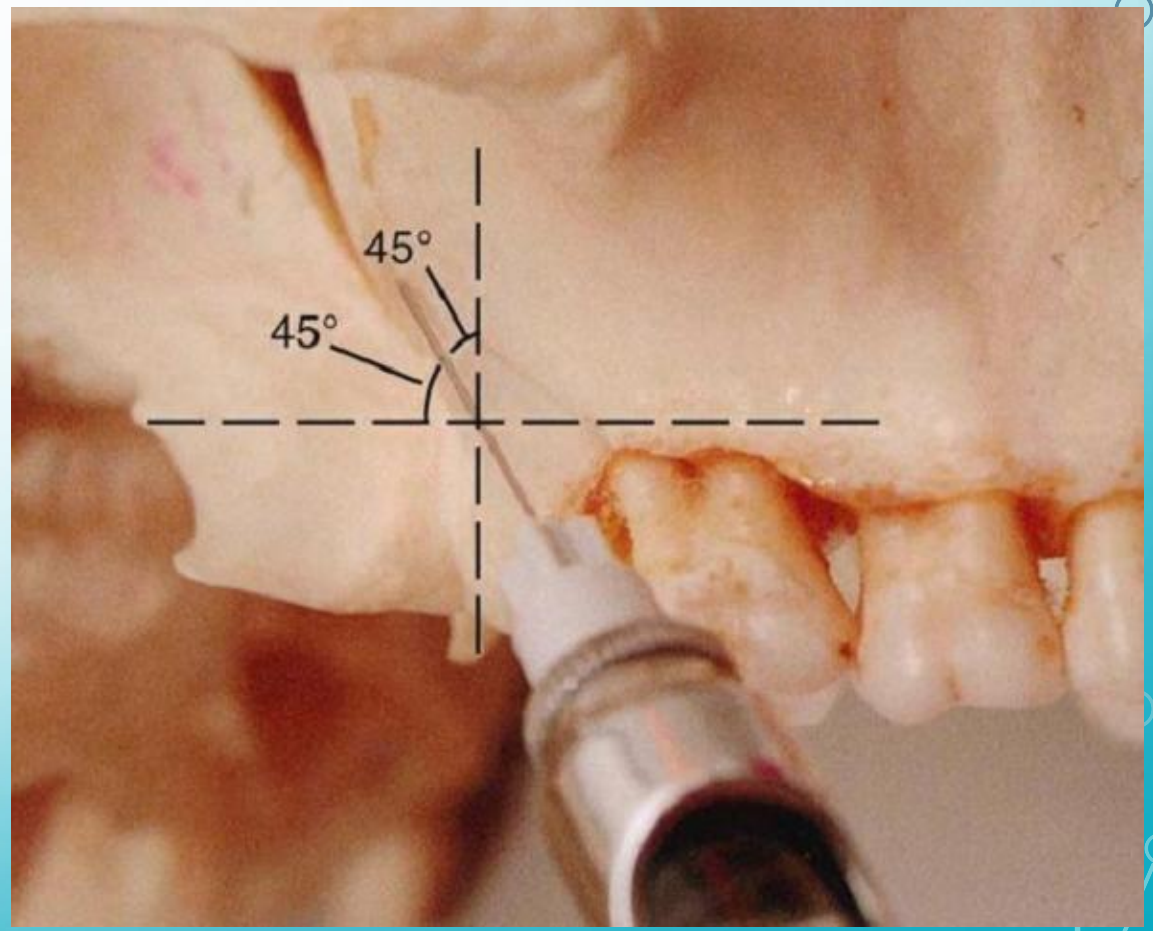
- –**Left PSA nerve block**, a right-handed administrator -10 o'clock position facing the patient.
- –**Right PSA block**, a right-handed administrator -8 o'clock position facing the patient

PROCEDURE

- Apply a topical antiseptic (optional).
- Orient the **bevel** of the needle **toward bone**.
- Partially open the patient's mouth, pulling the mandible to the side of injection.
- Retract the patient's cheek with your finger (for visibility).
- Pull the tissues at the injection site taut.
- Insert the needle into the height of the **mucobuccal fold** over the second molar

PROCEDURE

- Advance the needle slowly in an upward, inward, and backward direction in one movement (not three)
  - **Upward:** superiorly at a 45-degree angle to the occlusal plane
  - **Inward:** medially toward the midline at a 45-degree angle to the occlusal plane
  - **Backward:** posteriorly at a 45-degree angle to the long axis of the second molar



PROCEDURE

- Slowly advance the needle through soft tissue.
  - Ideally there should be no resistance and therefore no discomfort to the patient.
  - If resistance (bone) is felt, the angle of the needle in toward the midline is too great.
- Withdraw the needle slightly (but do not remove it entirely from the tissues) and bring the syringe barrel closer to the occlusal plane.
- Readvance the needle.

PROCEDURE

- Advance the needle to the desired depth

Adult of normal size: depth of 16 mm places the needle tip in the immediate vicinity of target area

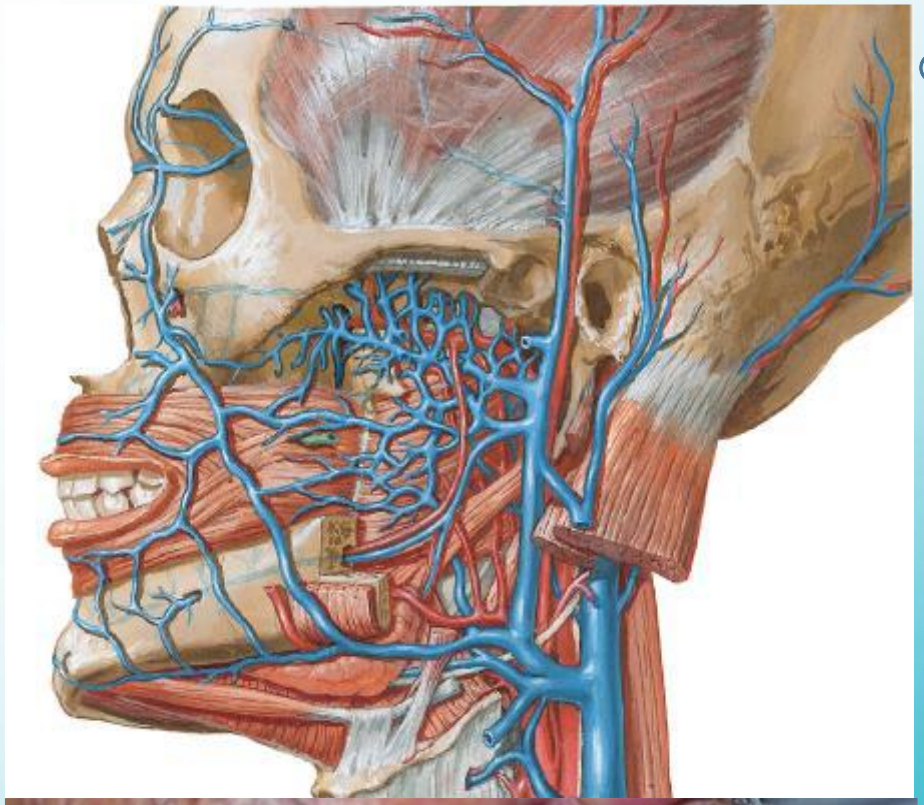
- Aspirate in two planes.
- If both aspirations are negative: Slowly, over 30 to 60 seconds, deposit 0.9 to 1.8 mL of anesthetic solution.
- Slowly withdraw the syringe.
- Wait minimally 3 to 5 minutes before commencing the dental procedure.

COMPLICATIONS

- **Hematoma:** inserting the needle too far posteriorly into the **pterygoid plexus** of veins and in addition, the **maxillary artery** may be perforated.

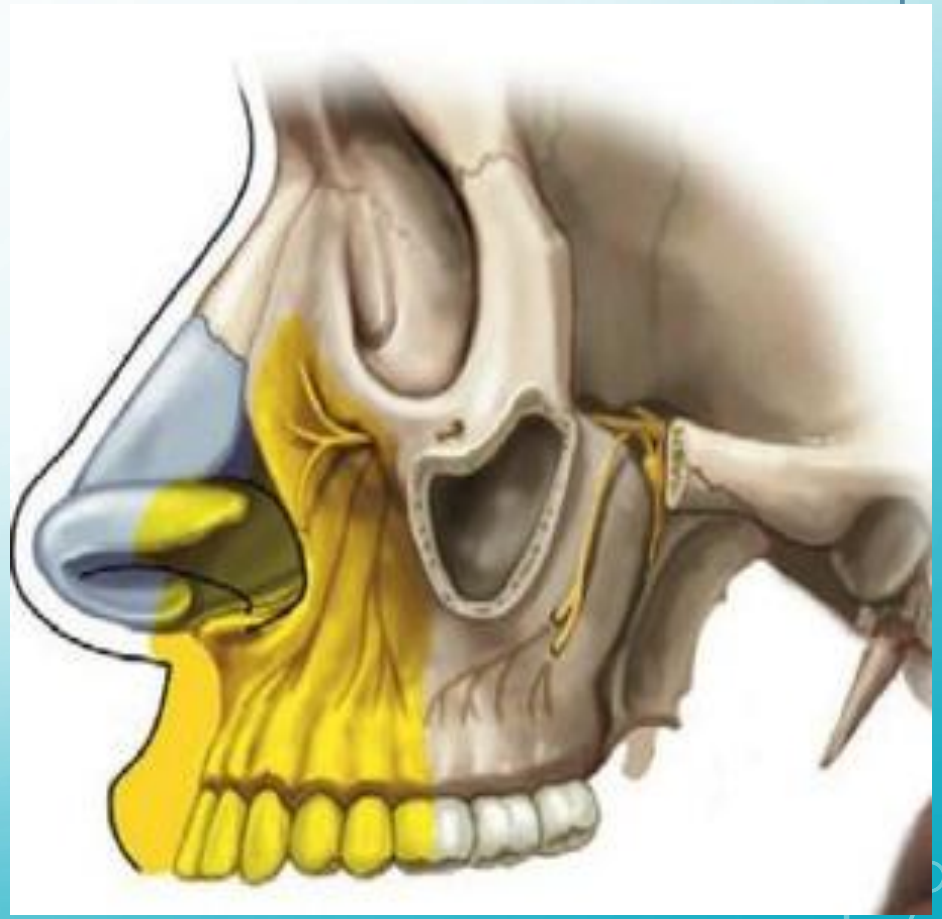
–Use of a short needle minimizes the risk of pterygoid plexus puncture.

- **Mandibular anesthesia:** V3 is located lateral to the PSA nerves. Deposition of local anesthetic lateral to the desired location may produce varying degrees of mandibular anesthesia.



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

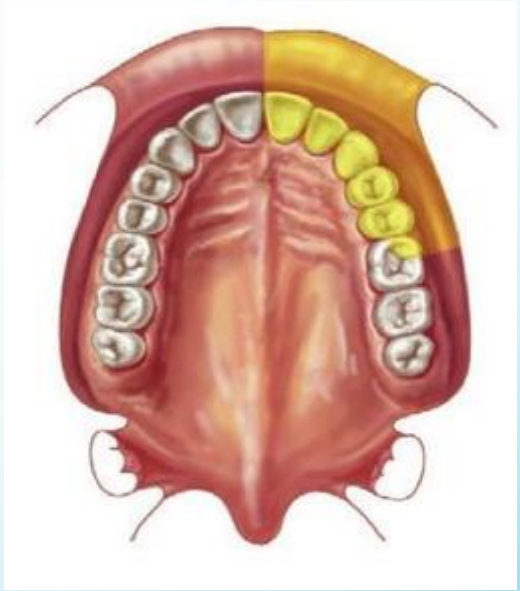
- Also known as **Infraorbital Nerve Block.**
- Not so popular –general lack of experience with this highly successful and extremely safe technique.
- **Infraorbital nerve** provides anesthesia to the soft tissues of the anterior portion of the face, not to the teeth or intraoral soft and hard tissues.
- Therefore it is **inaccurate** to call the ASA nerve block the **infraorbital nerve block**



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Nerves Anesthetized

- Anterior superior alveolar
- Middle superior alveolar
- Infraorbital nerve
  - Inferior palpebral
  - Lateral nasal
  - Superior labial



Areas Anesthetized

- Pulps of the maxillary central incisor through the canine on the injected side
- In about 72% of patients, pulps of the maxillary premolars and mesiobuccal root of the first molar
- Buccal (labial) periodontium and bone of these same teeth
- Lower eyelid, lateral aspect of the nose, upper lip

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Indications

- Dental procedures involving more than two maxillary teeth and their overlying buccal tissues
- Inflammation or infection (which contraindicates supraperiosteal injection)
- When supraperiosteal injections have been ineffective because of dense cortical bone.

Contraindications

- –Discrete treatment areas (one or two teeth only; supraperiosteal preferred)
- –Hemostasis of localized areas

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Advantages

- Comparatively simple technique
- Comparatively safe; minimizes the volume of solution used and the number of needle punctures necessary to achieve anesthesia.

Disadvantages

- ***Psychological***
  - **Administrator:** There may be an initial fear of injury to the patient's eye
  - **Patient:** An extraoral approach to the infraorbital nerve may prove disturbing; however, intraoral techniques are rarely a problem.
- ***Anatomic***: difficulty defining landmarks (rare)

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

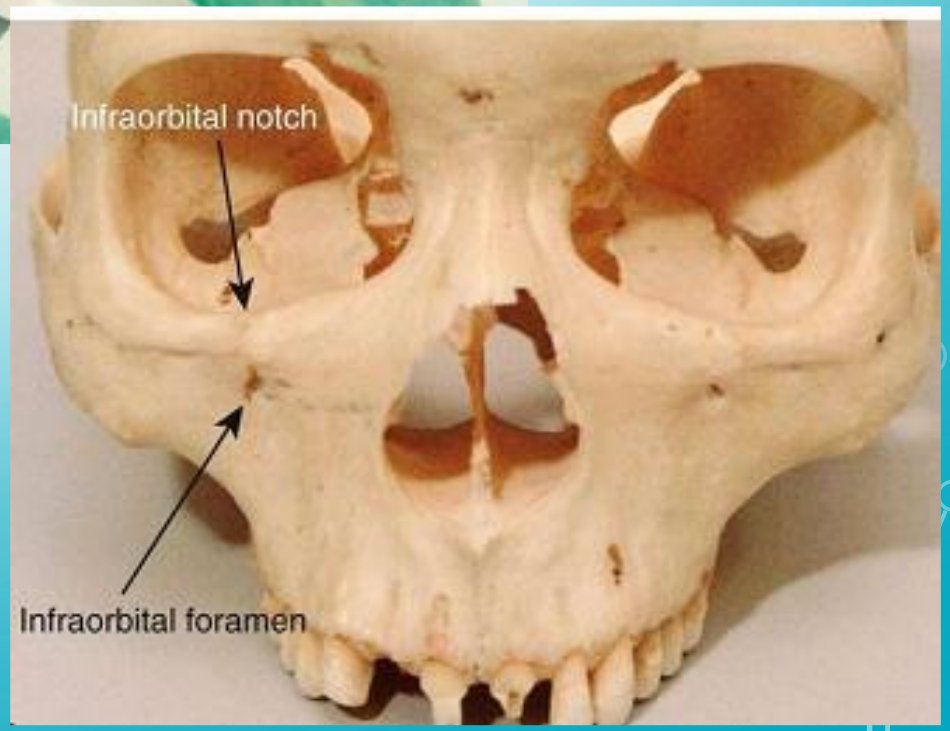
Technique

- **Positive Aspiration**: 0.7%.
- **Alternatives**
  - Supraperiosteal, PDL, or IO injection for each tooth
  - Infiltration for the periodontium and hard tissues
  - Maxillary nerve block

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Technique

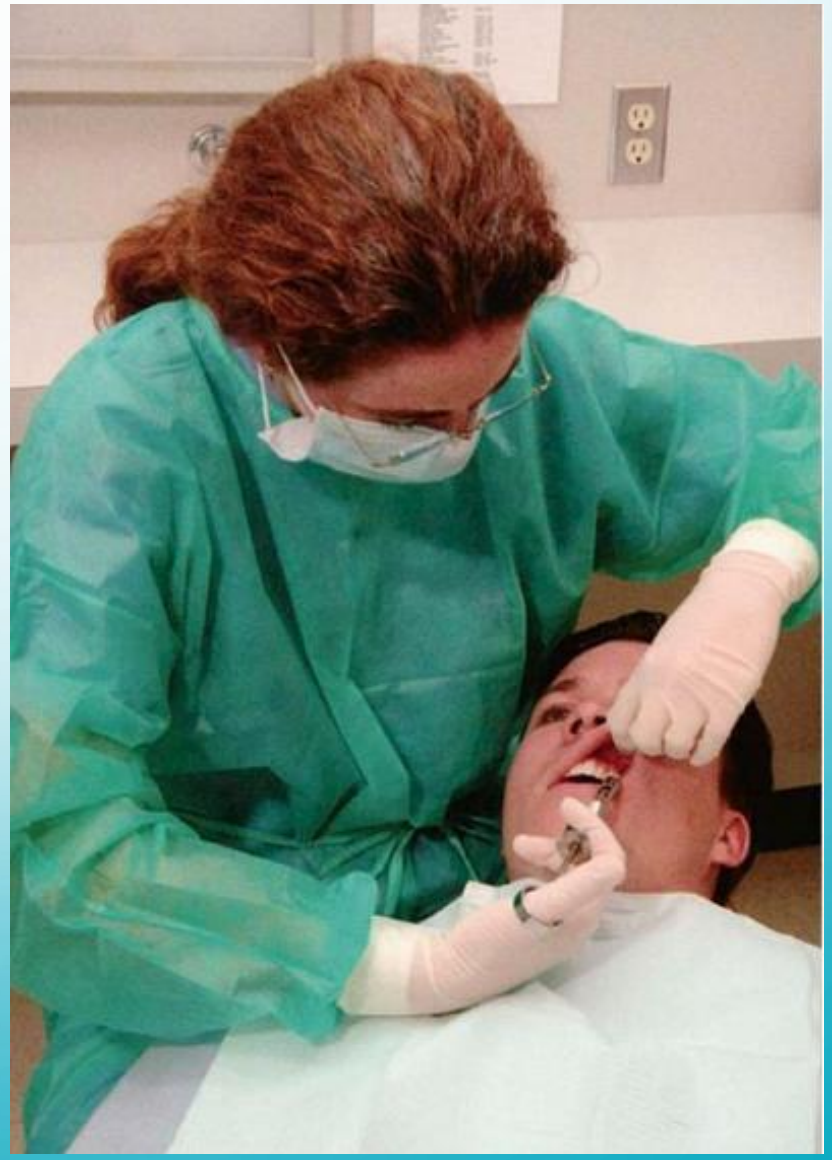
- 25-or 27-gauge long needle is recommended
- **Area of insertion:** height of the mucobuccalfold directly over the first premolar.
- **Target area:** infraorbital foramen
- **Landmarks**
  - Mucobuccal fold
  - Infraorbital notch
  - Infraorbital foramen
- •**Orientation of the bevel:** toward bone



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

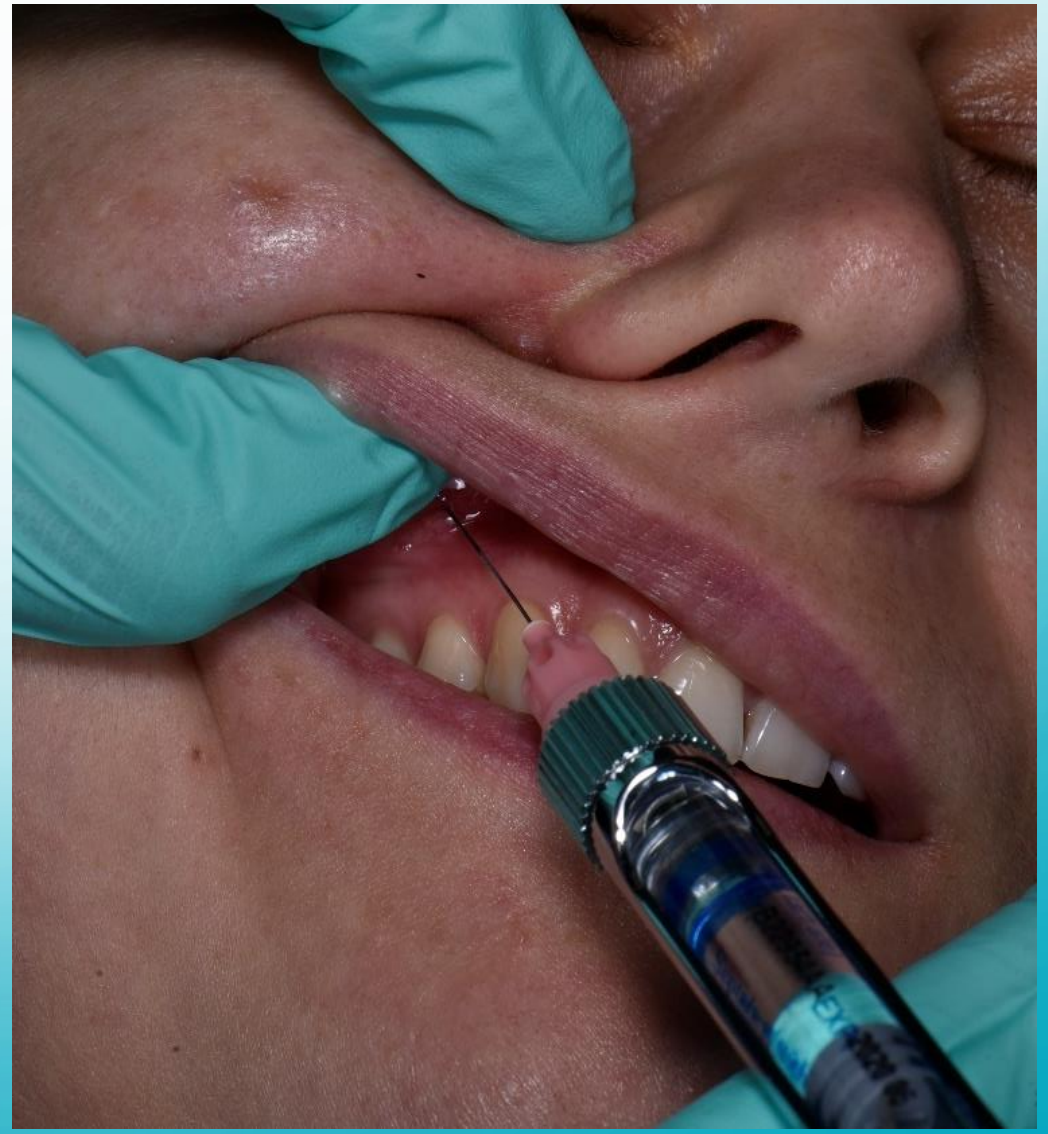
- Assume the correct position
- For a right or left infraorbital nerve block (right-handed) -10 o'clock position directly facing the patient.



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

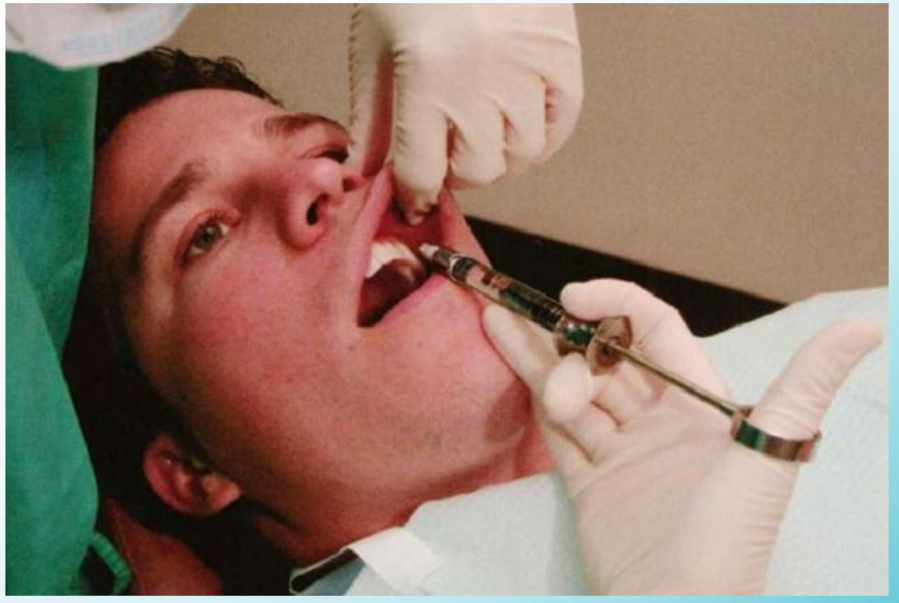
- Prepare the tissues at the injection site.
- Locate the infraorbital foramen
- Feel the infraorbital notch.
  - Move your finger downward from the notch, applying gentle pressure to the tissues.
  - The bone immediately inferior to the notch is convex (felt as an outward bulge). This represents the lower border of the orbit and the roof of the infraorbital foramen
  - As your finger continues inferiorly, a concavity is felt; this is the infraorbital foramen.
  - The patient senses a mild soreness when the foramen is palpated as the infraorbital nerve is pressed against bone.



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

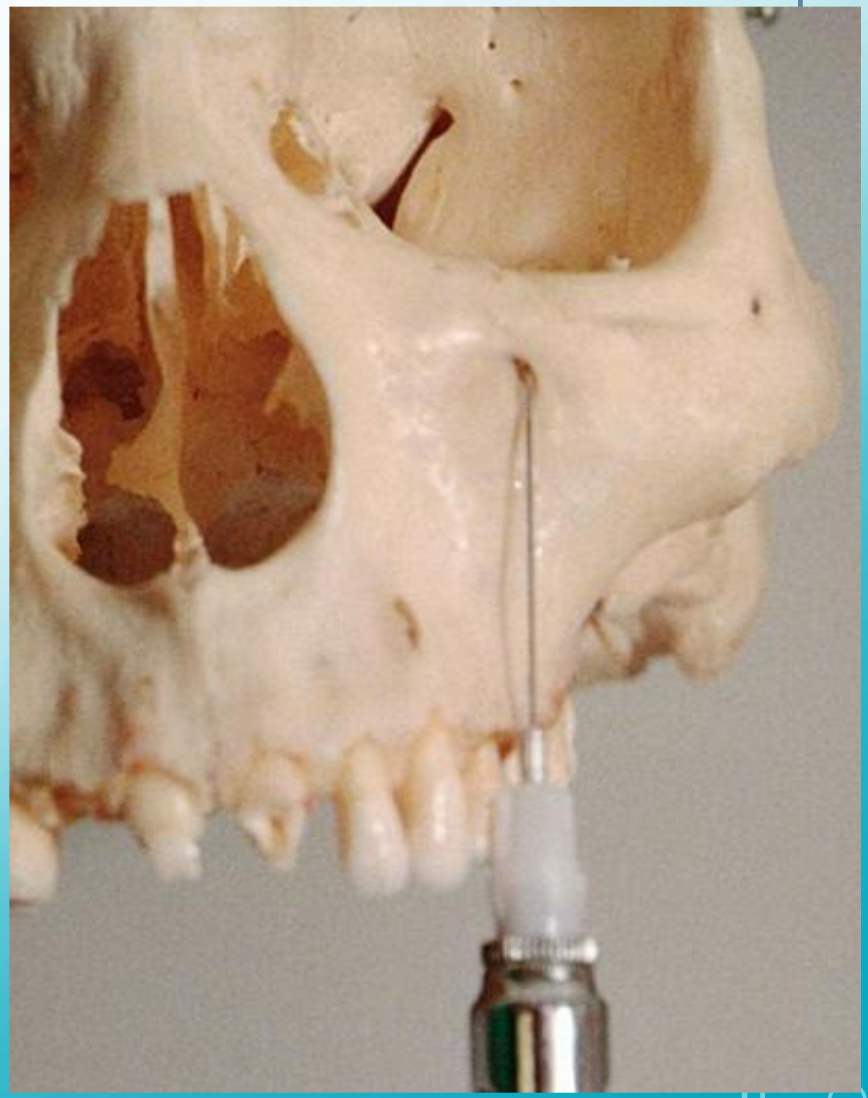
- Maintain your finger on the foramen or mark the skin at the site.
- Retract the lip, pulling the tissues in the mucobuccal fold taut and increasing visibility.
- Insert the needle into the height of the mucobuccal fold over the first premolar with the bevel facing bone
- Orient the syringe toward the infraorbital foramen.



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

- The needle should be held parallel with the long axis of the tooth as it is advanced, to avoid premature contact with bone
- Advance the needle slowly until bone is gently contacted.
  - The point of contact should be the upper rim of the infraorbital foramen.
  - The general depth of needle penetration is 16 mm for an adult of average height
  - The depth of penetration varies
    - In a patient with a high (deep) mucobuccal fold
    - a low infraorbital foramen
  - A preinjection approximation of the depth of penetration can be made by placing one finger



ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

- Before injecting the anesthetic solution, check for the following:
  - Depth of needle penetration (adequate to reach the foramen)
  - Any lateral deviation of the needle from the infraorbital foramen;
  - Orientation of the bevel (facing bone)
  - Position the needle tip during injection with the bevel facing into the infraorbital foramen and the needle tip touching the roof of the foramen
- Aspirate in two planes.

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

- Slowly deposit 0.9 to 1.2 mL(over 30 to 40 seconds).
- Little or no swelling should be visible as the solution is deposited.
- If the needle tip is properly inserted at the opening of the foramen, solution is directed toward the foramen.
  - The administrator is able to “feel” the anesthetic solution as it is deposited beneath the finger on the foramen if the needle tip is in the correct position.
  - At the conclusion of the injection, the foramen should no longer be palpable (because of the volume of anesthetic in this position).
  - At this point, the infraorbital nerve block (providing anesthesia to the soft tissues on the anterior portion of the face and the lateral aspect of the nose) is complete.

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Procedure

- To transform it into the **anterior superior alveolar nerve** block do the following:
  - Maintain firm pressure with your finger over the injection site both during and for at least 1 minute after the injection
  - Withdraw the syringe slowly and immediately make the needle safe.
  - Maintain direct finger pressure over the injection site for a minimum of 1 minute, preferably 2 minutes, after injection.
  - Wait a minimum of 3 to 5 minutes after completion of the injection before commencing the dental procedure.

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Signs and Symptoms

- **Subjective:** Tingling and numbness of the lower eyelid, side of the nose, and upper lip
- **Subjective and objective:** numbness in the teeth and soft tissues along the distribution of the ASA and MSA nerves
- **Objective**
  - electrical pulp testing -no response
  - Absence of pain during treatment

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Safety Features

- Needle contact with bone at the roof of the infraorbital foramen prevents inadvertent over-insertion and possible puncture of the orbit.
- A finger positioned over the infraorbital foramen helps direct the needle toward the foramen.
  - The needle should not be palpable. If it is felt, then its path is too superficial (away from the bone).
  - In most patients, it is not possible to palpate the needle through soft tissues over the foramen unless it is too superficial.

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Precautions

- For pain on insertion of the needle and tearing of the periosteum, reinsert the needle in a more lateral (away from bone) position, or deposit solution as the needle advances through soft tissue.
- To prevent overinsertion of the needle, estimate the depth of penetration before injection (review procedure), and exert finger pressure over the infraorbital foramen.
- Overinsertionis unlikely because of the rim of bone that forms the superior rim of the infraorbital foramen. The needle tip contacts this rim.

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Failures of Anesthesia

- Needle contacting bone below (inferior to) the infraorbital foramen. To correct:
  - Keep the needle in line with the infraorbital foramen during penetration. Do not direct the needle toward bone.
  - Estimate the depth of penetration before injecting.
- Needle deviation medial or lateral to the infraorbital foramen. To correct:
  - Direct the needle toward the foramen immediately after inserting and before advancing through the tissue.
  - Recheck needle placement before aspirating and depositing the anesthetic solution

ANTERIOR SUPERIOR ALVEOLAR NERVE BLOCK

Complications

- **Hematoma**(rare) may develop

–across the lower eyelid and the tissues between it and the infraorbital foramen.

- **Management:** apply pressure on the soft tissue over the foramen for 2 to 3 minutes.

Its extremely rare because pressure is routinely applied to the injection site both during and after administration of the ASA nerve block.

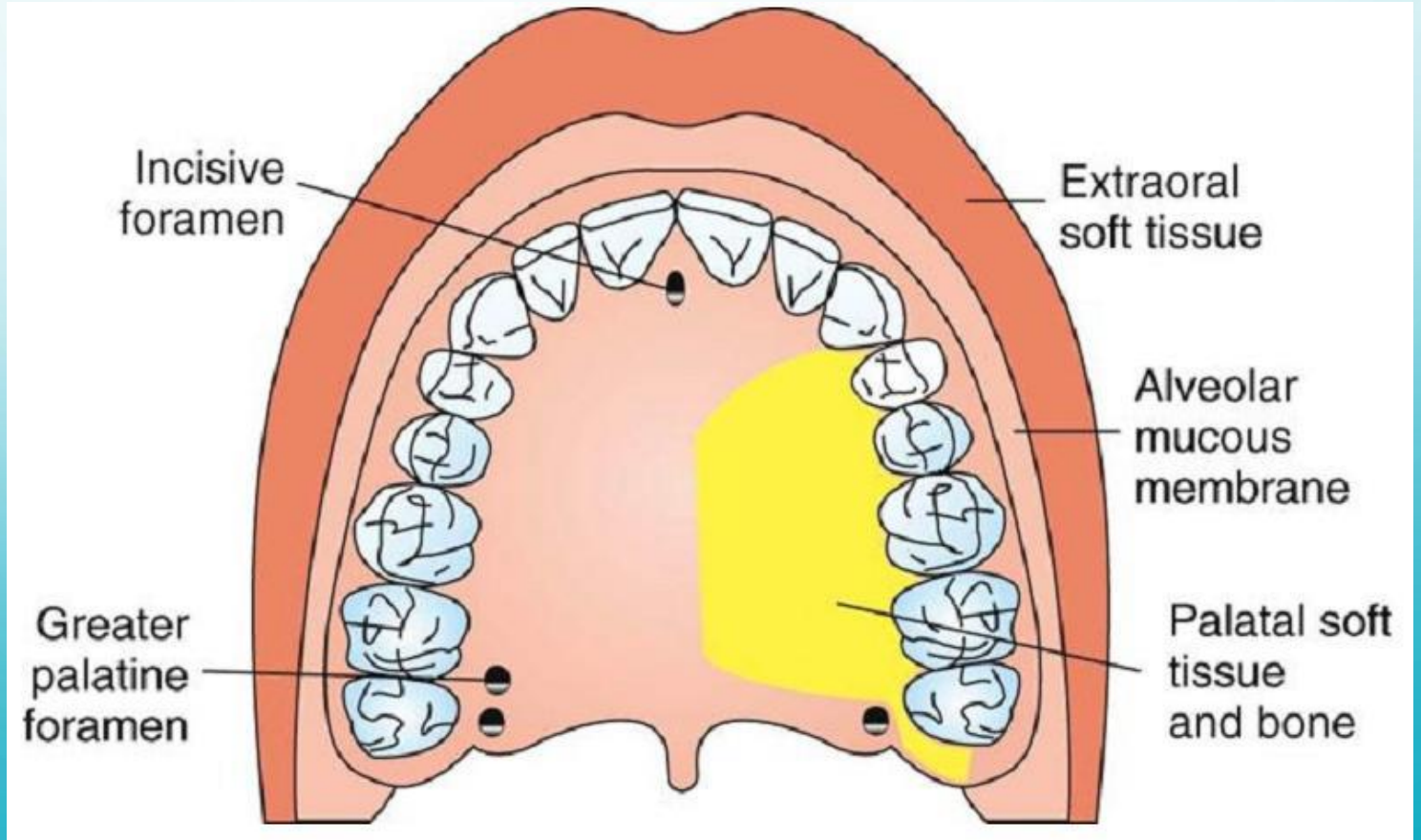
GREATER PALATINE NERVE BLOCK

- Also known as **Anterior palatine nerve block.**
- Although potentially traumatic, its less than the nasopalatinenerve block
  - –tissues surrounding the greater palatine foramen are not as firmly adherent to bone
  - –therefore are better able to accommodate the volume of solution deposited.
- **Nerve Anesthetized:** Greater palatine

GREATER PALATINE NERVE BLOCK

Areas Anesthetized

- The posterior portion of the hard palate and its overlying soft tissues, anteriorly as far as the first premolar and medially to the midline



GREATER PALATINE NERVE BLOCK

Indications

- When palatal soft tissue anesthesia is necessary for restorative therapy on more than two teeth
  - –Ex: subgingival restorations -insertion of matrix bands subgingivally
- For pain control during periodontal or oral surgical procedures involving the palatal soft and hard tissues

Contraindications

- Inflammation or infection at the injection site
- Smaller areas of therapy (one or two teeth)

GREATER PALATINE NERVE BLOCK

Advantages

- Minimizes needle penetrations and volume of solution
- Minimizes patient discomfort

Disadvantages

- No hemostasisexcept in the immediate area of injection
- Potentially traumatic
- Positive Aspiration: Less than 1%.

Alternatives

- Local infiltration into specific regions
- Maxillary nerve block

GREATER PALATINE NERVE BLOCK

Technique

- A 27-gauge short needle is recommended.
- **Area of insertion:** soft tissue slightly anterior to the greater palatine foramen
- **Target area:** greater (anterior) palatine nerve as it passes anteriorly between soft tissues and bone of the hard palate
- **Landmarks:** greater palatine foramen and junction of the maxillary alveolar process and palatine bone
- **Path of insertion:** advance the syringe from the opposite side of the mouth at a right angle to the target area
- **Orientation of the bevel:** toward the palatal soft tissues

GREATER PALATINE NERVE BLOCK

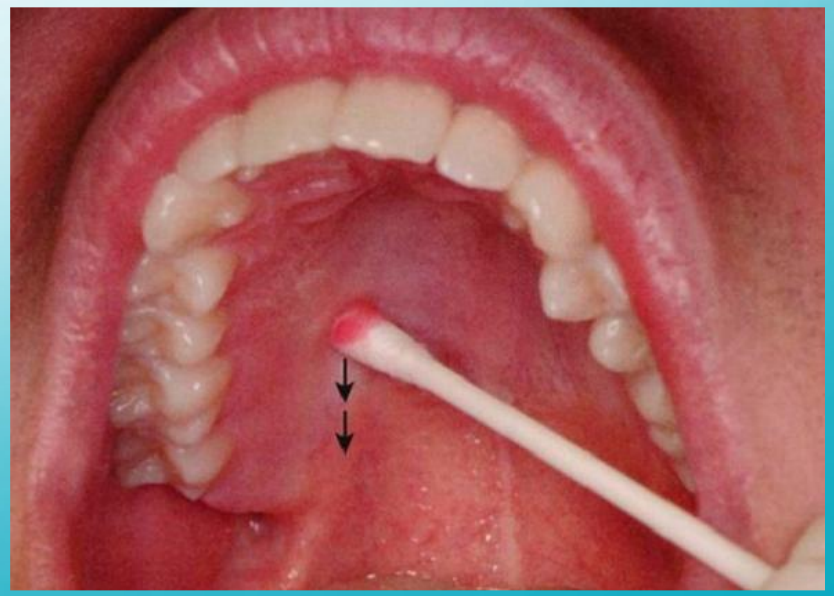
Procedure

- Assume the correct position
  - **Right GPN block** (right-handed administrator): 7 or 8 o'clock position.
  - **Left GPN block:** 11 o'clock position.
- **Patient:** a supine position with mouth opened wide and extended neck.

GREATER PALATINE NERVE BLOCK

Procedure

- Turn the head to the left or right (for improved visibility).
- Locate the **greater palatine foramen**
  - –Place a cotton swab at the junction of the maxillary alveolar process and the hard palate.
  - –Start in the region of the maxillary first molar and palpate posteriorly by pressing firmly into the tissues with the swab.
  - –The swab “falls” into the depression created by the greater palatine foramen



GREATER PALATINE NERVE BLOCK

Procedure

- The foramen is most frequently located distal to the maxillary second molar, but it may be located anterior or posterior to its usual position
- Prepare the tissue at the injection site, just 1 to 2 mm anterior to the greater palatine foramen.
  - Clean and dry with sterile gauze.
  - Apply topical antiseptic (optional).
  - Apply topical anesthetic for 2 minutes.
- Move the swab posteriorlyso it is directly over the greater palatine foramen.
  - Apply considerable pressure at the area of the foramen with the swab
  - Note the ischemia (whitening of the soft tissues) at the injection site.

GREATER PALATINE NERVE BLOCK

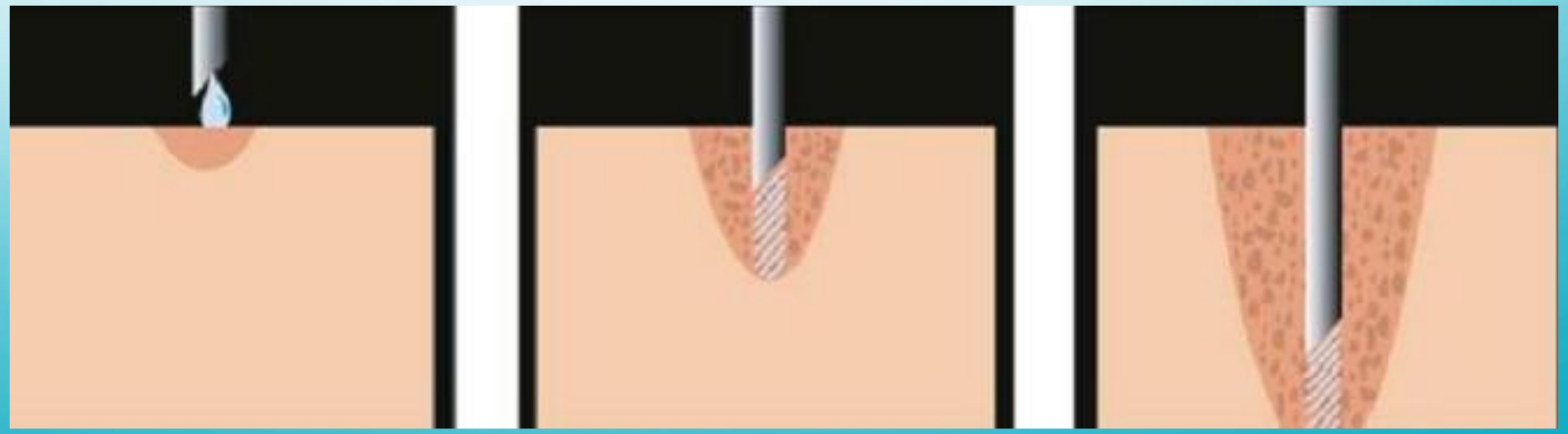
Procedure

- Direct the syringe into the mouth from the **opposite side** with the needle approaching the injection site at a right angle

GREATER PALATINE NERVE BLOCK

Procedure

- Place the bevel (not the point) of the needle gently against the previously blanched (ischemic) soft tissue at the injection site.
- It must be well stabilized to prevent accidental penetration of the tissues.



GREATER PALATINE NERVE BLOCK

Procedure

- With the bevel lying against the tissue
  - Angle the needle a little and deposit a small volume of anesthetic -forced against the mucous membrane
  - Straighten the needle and permit the bevel to penetrate mucosa.
- Continue to deposit small volumes of anesthetic throughout the procedure.
- Ischemia spreads into adjacent tissues as the anesthetic

GREATER PALATINE NERVE BLOCK

Procedure

- Continue to apply pressure anesthesia throughout the deposition of the anesthetic solution
- Slowly advance the needle until palatine bone is gently contacted.
  - The depth of penetration is usually about 5 mm.
- Aspirate in two planes
- slowly deposit (30 second minimum): 0.45 to 0.6 ml
- Withdraw the syringe.
- Make the needle safe.
- Wait 2 to 3 minutes before commencing the procedure.

GREATER PALATINE NERVE BLOCK

Signs and Symptoms

- **Subjective:** numbness in the posterior portion of the palate
- **Objective:** no pain during dental therapy
- **Safety Features:** Contact with bone
- **Precautions :**Do not enter the greater palatine canal.
  - Not hazardous: no reason to enter the canal for this technique to be successful

GREATER PALATINE NERVE BLOCK

Failures of Anesthesia

- Not a technically difficult injection to administer -success is well above 95%.
- If LA is deposited too far **anterior to the foramen,** inadequate soft tissue anesthesia posterior to the site of injection (partial success).
- Inadequate anesthesia in the area of the maxillary first premolar: **overlapping fibers** from the **nasopalatine nerve** (partial success).
  - To correct: Local infiltration may be necessary as a supplement in the area of inadequate anesthesia.

GREATER PALATINE NERVE BLOCK

Complications

- Few of significance
- **Ischemia** and necrosis of soft tissues when highly concentrated vasoconstricting solution used for hemostasis over a prolonged period
- **Hematoma** is possible but rare because of the density and firm adherence of palatal tissues to underlying bone.
- Some patients may be **uncomfortable** if their soft palate becomes anesthetized

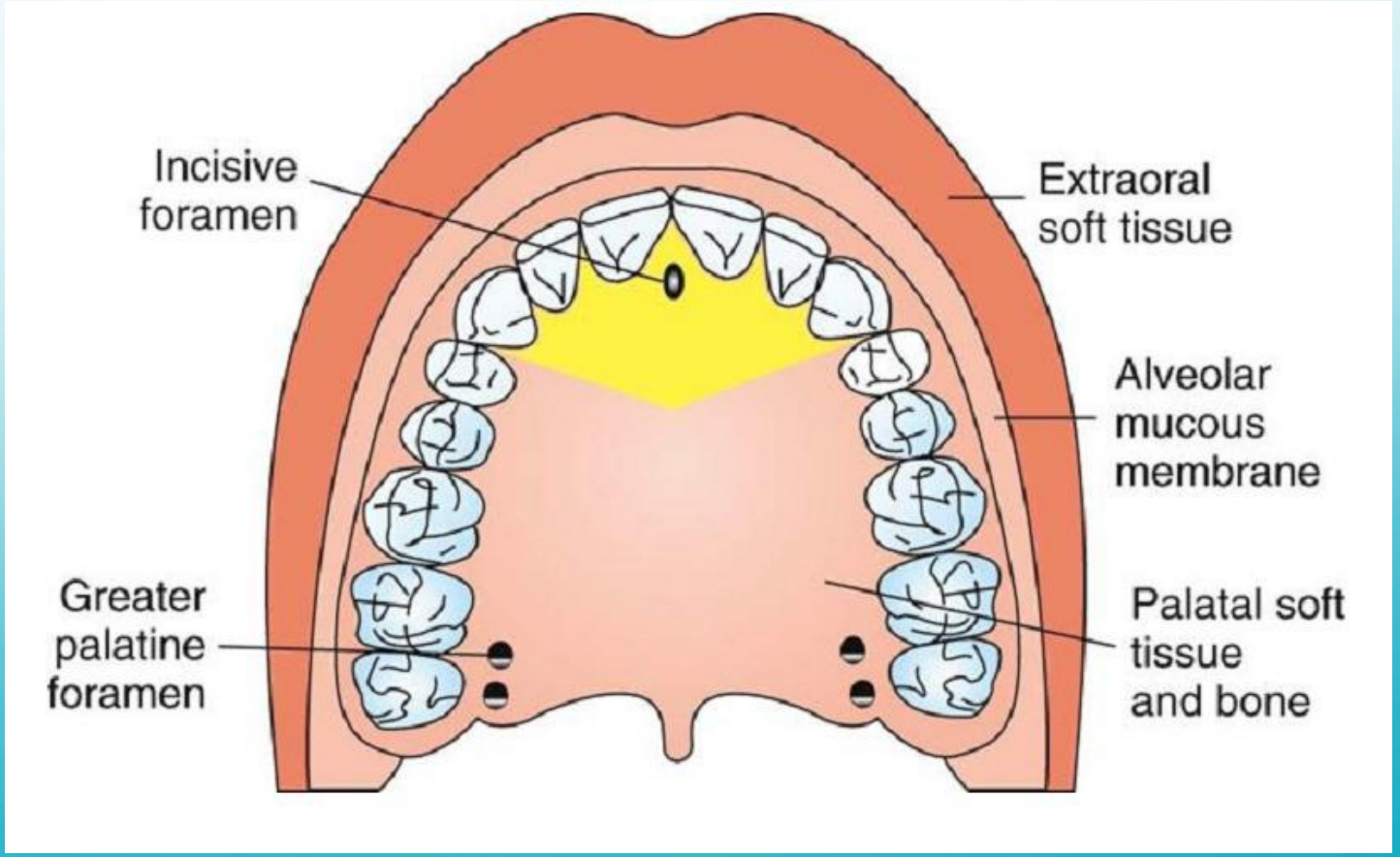
NASOPALATINE NERVE BLOCK

- Also known as **Incisive nerve block, sphenopalatinenerve block**
- Administration of a minimum volume of anesthetic solution.
- wide area of palatal soft tissue anesthesia is achieved
- Thereby minimizing the need for multiple palatal injections.
- **Nerves Anesthetized:** Nasopalatine nerves bilaterally.

NASOPALATINE NERVE BLOCK

Areas Anesthetized

- Anterior portion of the hard palate (soft and hard tissues) bilaterally from the mesialof the right first premolar to the mesialof the left first premolar



NASOPALATINE NERVE BLOCK

Indications

- When palatal soft tissue anesthesia is necessary for restorative treatment on more than two teeth (e.g., subgingival restorations, insertion of matrix bands subgingivally)
- For pain control during periodontal or oral surgical procedures involving palatal soft and hard tissues

Contraindications

- Inflammation or infection at the injection site
- Smaller area of therapy (one or two teeth)

NASOPALATINE NERVE BLOCK

Advantages

- •Minimizes needle penetrations and volume of solution
- •Minimal patient discomfort from multiple needle penetrations

Disadvantages

- No hemostasis except in the immediate area of injection
- Potentially the most traumatic intraoral injection; however
  - the **protocol** for an atraumaticinjection
  - or use of a **C-CLAD system**
  - or a **buffered local anesthetic** solution can minimize or entirely eliminate discomfort

NASOPALATINE NERVE BLOCK

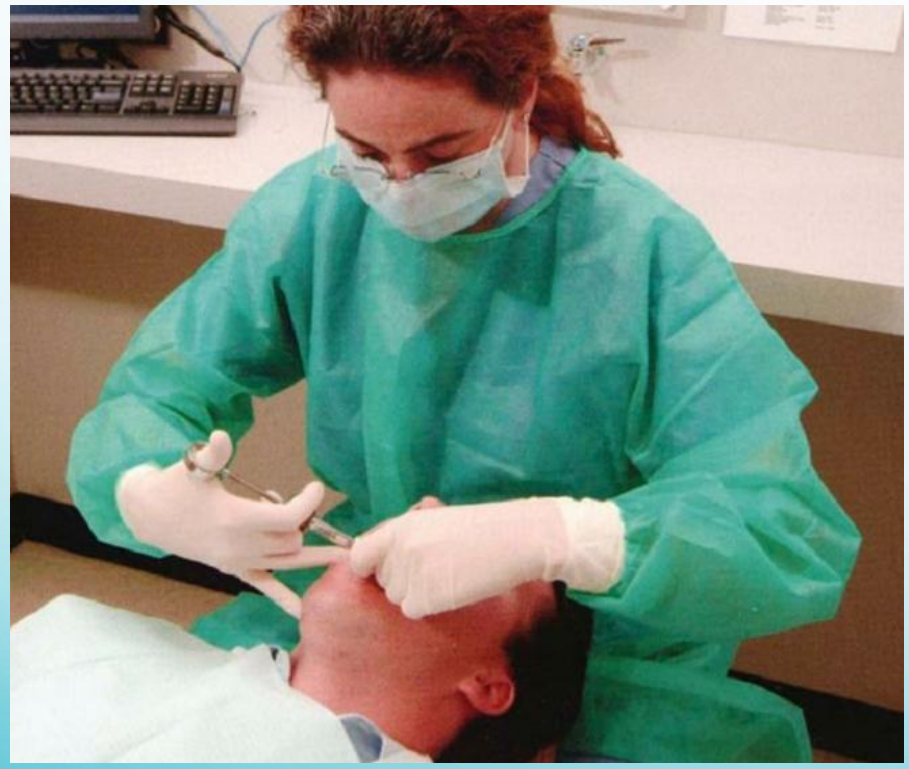
- **Positive Aspiration:** Less than 1%.
- **Alternatives**
  - Local infiltration into specific regions
  - Maxillary nerve block (unilateral only)
  - Anterior middle superior alveolar (AMSA) nerve block (unilateral only)

NASOPALATINE NERVE BLOCK

Technique: Single-Needle Penetration

- 27-gauge short needle is recommended.
- **Area of insertion:** palatal mucosa just lateral to the incisive papilla -more sensitive than other palatal mucosa
- **Target area:** incisive foramen, beneath the incisive papilla
- **Landmarks:** central incisors and incisive papilla
- **Path of insertion:** Approach the injection site at a 45-degree angle toward the incisive papilla.
- **Orientation of the bevel:** toward the palatal soft tissue

NASOPALATINE NERVE BLOCK



Procedure

- Sit at the 9 or 10 o'clock position
- Request the patient to: Open wide and Extend the neck.
- Turn the head to the left or right for improved visibility

NASOPALATINE NERVE BLOCK

- Prepare the tissue just lateral to the incisive papilla
- Clean and dry with sterile gauze.
- Apply topical antiseptic (optional) for 2 minutes.
- After 2 minutes of topical anesthetic application, move the swab directly onto the incisive papilla

NASOPALATINE NERVE BLOCK

Procedure

- With the swab in your left hand, apply pressure to the area of the papilla.
- Note ischemia at the injection site.
- Place the bevel against the ischemic soft tissues at the injection site.
- The needle must be well stabilized to prevent accidental penetration of tissues.

NASOPALATINE NERVE BLOCK

Procedure

- With the bevel lying against the tissue
- Apply enough pressure to bow the needle slightly.
- Deposit a small volume of anesthetic.
- The solution will be forced against the mucous membrane.
- Straighten the needle and permit the bevel to penetrate the mucosa.
- Continue to deposit small volumes of anesthetic throughout the procedure.
- Observe ischemia spreading into adjacent tissues as solution is deposited

NASOPALATINE NERVE BLOCK

Procedure

- Continue to apply pressure with the cotton applicator stick while injecting the anesthetic.
- Slowly advance the needle toward the incisive foramen until bone is gently contacted
- The depth of penetration normally is not greater than 5 mm.
- Deposit small volumes of anesthetic while advancing the needle.
- As the tissue is entered, resistance to the deposition of solution is significantly increased; this is normal with this block

NASOPALATINE NERVE BLOCK

Procedure

- Withdraw the needle 1 mm (to prevent subperiostealinjection).
- The bevel now lies over the center of the incisive foramen.
- Aspirate in two planes.
- If negative, slowly deposit (15-to 30-second minimum) not more than 0.45 mL
- In some patients, it is difficult to deposit 0.45 mLof anesthetic solution in this injection.
- Slowly withdraw the syringe.
- Make the needle safe.
- Wait 2 to 3 minutes before commencing the dental procedure.

NASOPALATINE NERVE BLOCK

Signs and Symptoms

- **Subjective:** numbness in the anterior portion of the palate
- **Objective:** no pain during dental therapy
- **Safety Features:** Contact with bone

Precautions

- **Against pain**
  - Do not insert directly into the incisive papilla (quite painful).
  - Do not deposit solution too rapidly.
  - Do not deposit too much solution.
- **Against infection**
  - If the needle is advanced more than 5 mm into the incisive canal and the floor of the nose is entered accidentally, infection may result.
  - There is no reason for the needle to enter the incisive canal during a nasopalatinenerve block.

NASOPALATINE NERVE BLOCK

Failures of Anesthesia

- Highly successful injection (>95% incidence of success)
- **Unilateral anesthesia:** If solution is deposited to one side of the incisive canal
  - **To correct:** Reinsert the needle into the already anesthetized tissue and reinject solution into the un anesthetized area.
- Inadequate palatal soft tissue anesthesia in the area of the maxillary canine and first premolar
  - fibers from the GPN overlap those of the nasopalatine nerve,
  - **To correct:** Local infiltration may be necessary as a supplement in the area inadequately anesthetized

NASOPALATINE NERVE BLOCK

Complications

- Few of significance
- Hematoma is possible but extremely rare because of the density and firm adherence of palatal soft tissues to bone.
- Necrosis of soft tissues is possible when highly concentrated vasoconstricting solution (e.g., norepinephrine) is used for hemostasis over a prolonged period
- Because of the density of soft tissues, anesthetic solution may “squirt” back out the needle puncture site during administration or after needle withdrawal.

Maxilarul inferior	
Anestezia la Spina Spix **Nervul alveolar inferior**	Dinții mandibulari pe hemiarcada anesteziată, țesuturile moi din regiunea vestibulară în zona incisivilor, caninilor și premolarilor, de asemenea și hemibuza pe partea injectată.
Anestezia nervului bucal **Nervul bucal**	Țesuturile moi din regiunea vestibulară a regiunii molare
Anestezia la foramen mentonier **Nervul mentonier și incisival**	Țesuturile moi vestibulare, spre linia mediană de la orificiul mentonier, buza inferioară și bărbia. Premolarii, caninul, incisivii, buza inferioară, tegumentele în regiunea bărbiei, țesuturile moi vestibulare, spre linia mediană de la orificiul mentonier.
Anestezia nervului lingual **Nervul lingual**	Țesuturile moi din regiunea linguală pe hemiarcadă, planșeul bucal și jumătate de limbă

MANDIBULAR BLOCKS

- Deposit local anesthetic solution to within 1 mm of the target nerve
- Significantly higher failure rate.
  - Thicker cortical plate
  - Anatomical variation of location of **mandibularforamen.**

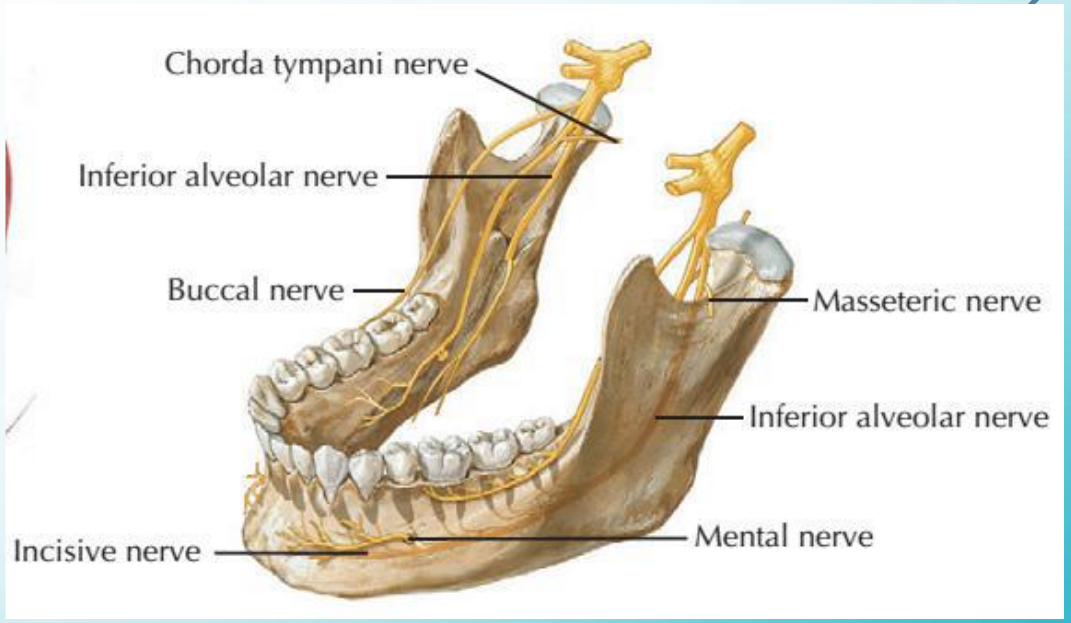
Nerve blocks have been described

- Inferior alveolar,
- Incisive,
- Gow-Gates mandibular,
- Vazirani-Akinosi (closed-mouth)
- Mental block
- Buccal nerves block

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

- Mostly reffered as ***mandibular nerve block.***
- Second most frequently used (after infiltration)
- **highest percentage** of **clinical failures** even

when properly administered.



- **Supplemental block** with **IANB**
  - **Buccal Block –**soft tissue on buccal aspect
  - **Supra-periosteal**–overlap of contralateral nerve mostly anterior
  - **Periodontal ligament (PDL) injection** -isolated portions of mandibular teeth sensitive even after successful IANB
  - **Intraosseous anesthesia (IO)**–ineffective IANB, primarily when the tooth is pulpally involved.

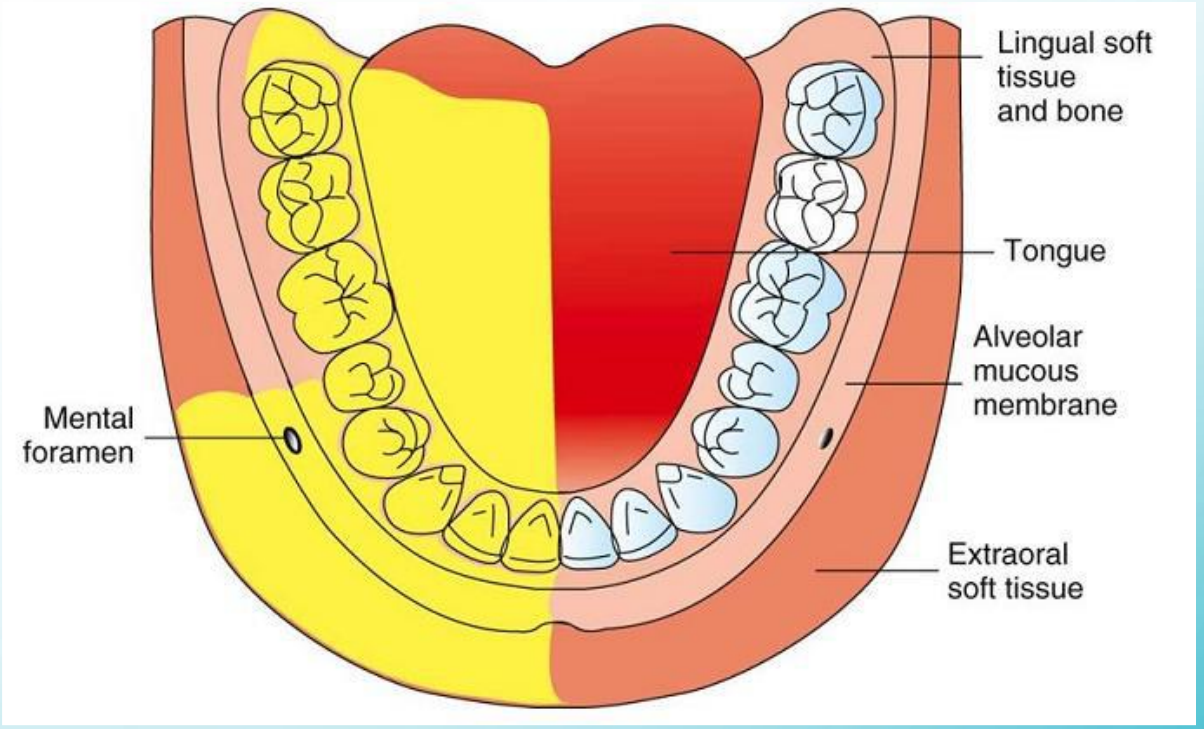
INFERIOR ALVEOLAR NERVE BLOCK (IANB)

- **Bilateral** IANBs is rarely indicated other than bilateral mandibular surgeries
  - considerable discomfort
  - feels unable to swallow
  - likely to self-injure the anesthetized soft tissues.
- **Multiple anterior tooth** (canine to canine)
  - IANB on most affected teeth
  - Incisive on the other side.

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Nerves Anesthetized

- Inferior alveolar,
- Incisive
- Mental
- Lingual (commonly)



Areas Anesthetized

- Mandibular teeth to the midline
- Body of the mandible, inferior portion of the ramus
- Buccal mucoperiosteum, mucous membrane anterior to the mental foramen (mental nerve)
- Anterior two thirds of the tongue and floor of the oral cavity (lingual nerve)
- Lingual soft tissues and periosteum (lingual nerve)

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Indications

- Procedures on multiple mandibularteeth in one quadrant
- When buccalsoft tissue anesthesia (anterior to the mental foramen) is necessary
- When lingual soft tissue anesthesia is necessary

Contraindications

- Infection or acute inflammation in the area of injection (rare)
- Patients who are more likely to bite their lip or tongue, for ex: physically challenged pt. and children

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Advantages: One injection provides a wide area of anesthesia

Disadvantages

- Wide area of anesthesia (not indicated for localized procedures)
- Rate of inadequate anesthesia (31% to 81%)
- Intraoral landmarks not consistently reliable
- Positive aspiration (10% to 15%, highest of all intraoral injection techniques)
- Lingual and lower lip anesthesia, discomfiting to many patients and possibly dangerous (self-inflicted soft tissue trauma) for certain individuals
- Partial anesthesia possible where a bifid inferior alveolar nerve and bifid mandibular canals are present;
- cross-innervation in lower anterior region

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

- Positive Aspiration: 10% to 15%.

Alternatives

- **Mental nerve block:** buccal soft tissue anesthesia anterior to the first molar
- **Incisive nerve block:** pulpal and buccal soft tissue anesthesia of teeth anterior to the mental foramen (usually second premolar to central incisor)
- **Supraperiosteal injection,** for pulpal anesthesia of the central and lateral incisors, and sometimes premolars and molars
- **Gow-Gates mandibular nerve** block
- **Vazirani-Akinosi mandibular nerve block**
- **PDL injection** for pulpal anesthesia of any mandibular tooth
- **IO injection** for pulpal and soft tissue anesthesia of any mandibular tooth, but especially molars

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Technique

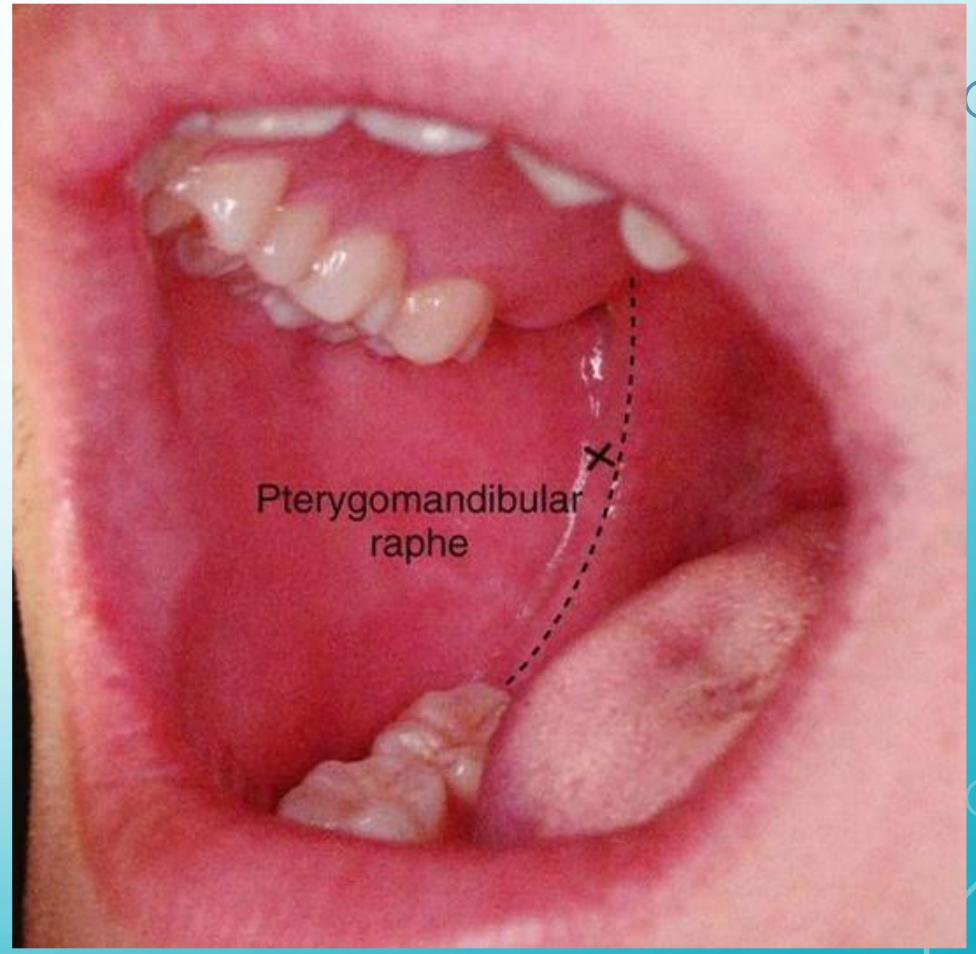
- A long dental needle is recommended for the adult patient.
  - A 25-gauge long needle is preferred
  - A 27-gauge long is acceptable
- **Area of insertion:** Mucous membrane on the medial (lingual) side of the mandibular ramus, at the intersection of two lines
- **Target area**: **Inferior alveolar nerve** as it passes downward toward the **mandibular foramen** but before it enters into the foramen.

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Landmarks

- **Coronoid notch** (greatest concavity on the anterior border of the ramus)
- **Pterygomandibular raphe**(vertical portion)
- **Occlusal plane** of the mandibular posterior teeth

Orientation of the needle bevel: bevel should face the bone, but less critical



INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Three parameters must be considered during administration of IANB:

- the height of the injection,
- the anteroposterior placement of the needle (which helps to locate a precise needle entry point)
- the depth of penetration (which determines the location of the inferior alveolar nerve)

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Procedure

1.Assume the correct position.

- **right IANB (right-handed)** -sit at the 8 o'clock position facing the patient
- **left IANB (right-handed) -**sit at the 10 o'clock position

2.Position the patient supine (recommended) or semisupine (if necessary).

3.Locate the needle penetration (injection) site.

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

4. Procedure

- –Needle penetration (injection) site
- **–Height of injection:** a line parallel to **occlusal plane** bisecting the thumb placed on **coronoid notch.**
- **–Point of injection:** deepest part of the pterygomandibular raphe

5. **Tissue preparation**

- –Dry with sterile gauze.
- –Apply topical antiseptic (optional) for 1 to 2 minutes.

6. Place the barrel of the syringe in the corner of the mouth on the contralateral side

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

7. Penetration depth: bone should be contacted ideally 20 to 25 mm (2/3 to 3/4 of a long needle).

- **If bone is contacted too soon**
  - needle tip is usually located too far anteriorly(laterally) on the ramus
  - Redirect the needle until a more appropriate depth of insertion is obtained
- **If bone is not contacted**
  - the needle tip usually is located too far posterior (medial)
  - To correct: Withdraw it slightly from the tissues and reposition the syringe barrel over the premolars and reinsert.

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

- **When bone is contacted,**
  - withdraw approximately **1 mm** to prevent **subperiosteal injection**
  - Aspirate in two planes
  - If negative, slowly deposit 1.5 mLof anesthetic over a minimum of 60 sec.

8. Slowly **withdraw** the syringe, and when approximately **half its length** remains within tissues, reaspirate.

- If negative, deposit a portion of the remaining solution (0.2 mL) to anesthetize the **lingual nerve**

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Signs and Symptoms

- **Subjective**
  - Tingling or numbness of the lower lip
  - Tingling or numbness of the tongue
- **Objective**
  - Using an electrical pulp tester (EPT)
  - No pain is felt during dental therapy
- **Precautions**
  - Do not deposit local anesthetic if bone is not contacted
  - needle tip may be resting within the parotid gland near the facial nerve (cranial nerve VII)
  - transient blockade (paralysis) of the facial nerve may develop if local anesthetic solution is deposited.
  - Avoid pain by not contacting bone too forcefully

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

Failures of Anesthesia

- Deposition of anesthetic too low (below the mandibular foramen).
- Deposition of the anesthetic too far anteriorly(laterally) on the ramus.
- Accessory innervation to the mandibular teeth -Incomplete anesthesia of the central or lateral incisors

INFERIOR ALVEOLAR NERVE BLOCK (IANB)

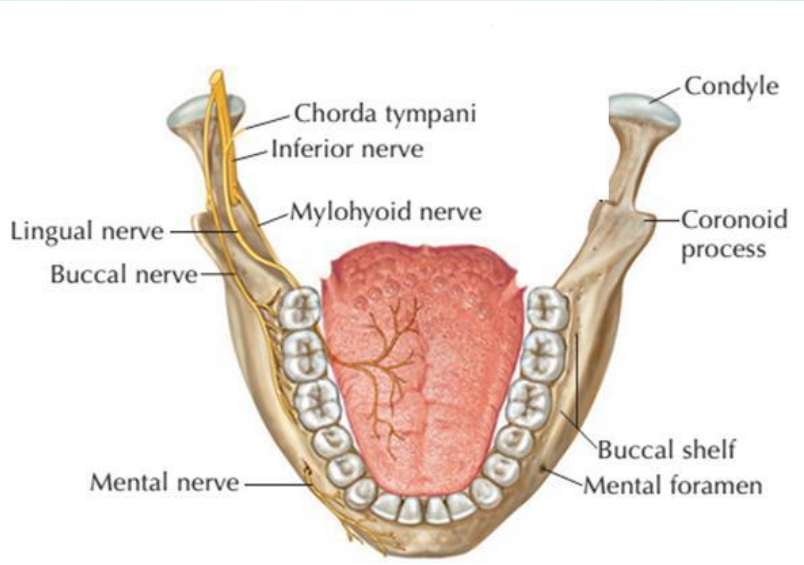
Complications

- **Hematoma** (rare) -Pressure and cold (e.g., ice) to the area for a minimum of 3 to 5 minutes
- **Trismus** a Muscle soreness or limited movement
- Transient **facial paralysis** (facial nerve anesthesia)

BUCCAL NERVE BLOCK

commonly referred to as the ***long buccal nerve block.***

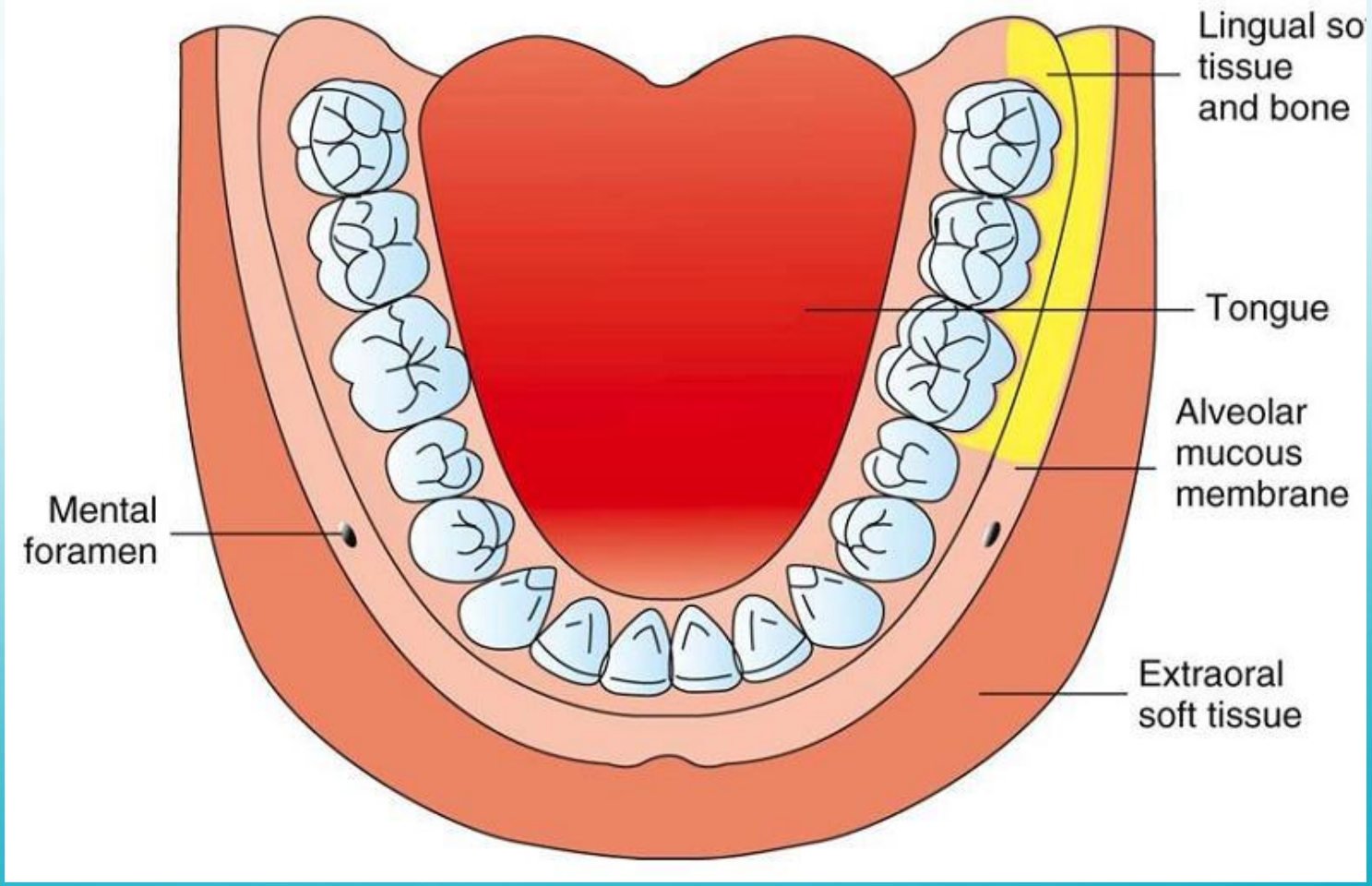
- success rate approaching 100%.
- Readily accessible to the local anesthetic as it lies immediately beneath the mucous membrane, not buried within bone.
- **Nerve Anesthetized:** Buccal (a branch of the anterior division of the V3)



BUCCAL NERVE BLOCK

Area Anesthetized

- Soft tissues and periosteum buccal to the mandibular molar teeth



BUCCAL NERVE BLOCK

Indication

- When buccal soft tissue anesthesia is necessary for dental procedures –mandibular molar region

Contraindication

- Infection or acute inflammation in the area of injection

Advantages

- High success rate
- Technically easy

Disadvantages

- Potential for pain if the needle contacts the periosteum during injection.

Positive Aspiration: 0.7 %

BUCCAL NERVE BLOCK

Signs and Symptoms

- Rarely experiences any subjective symptoms -location and small size of the anesthetized area

Objective: Instrumentation in the anesthetized area without pain indicates satisfactory pain control

Safety Features

- Needle contacts bone, therein preventing overinsertion.
- Minimum positive aspiration rate

BUCCAL NERVE BLOCK

Complications

- Few of any consequence
- Hematoma (bluish discoloration and tissue swelling at the injection site).
- Blood may exit the needle puncture point into the buccalvestibule.
  - –Apply pressure with gauze directly to the area of bleeding for a minimum of 3 to 5 minutes.

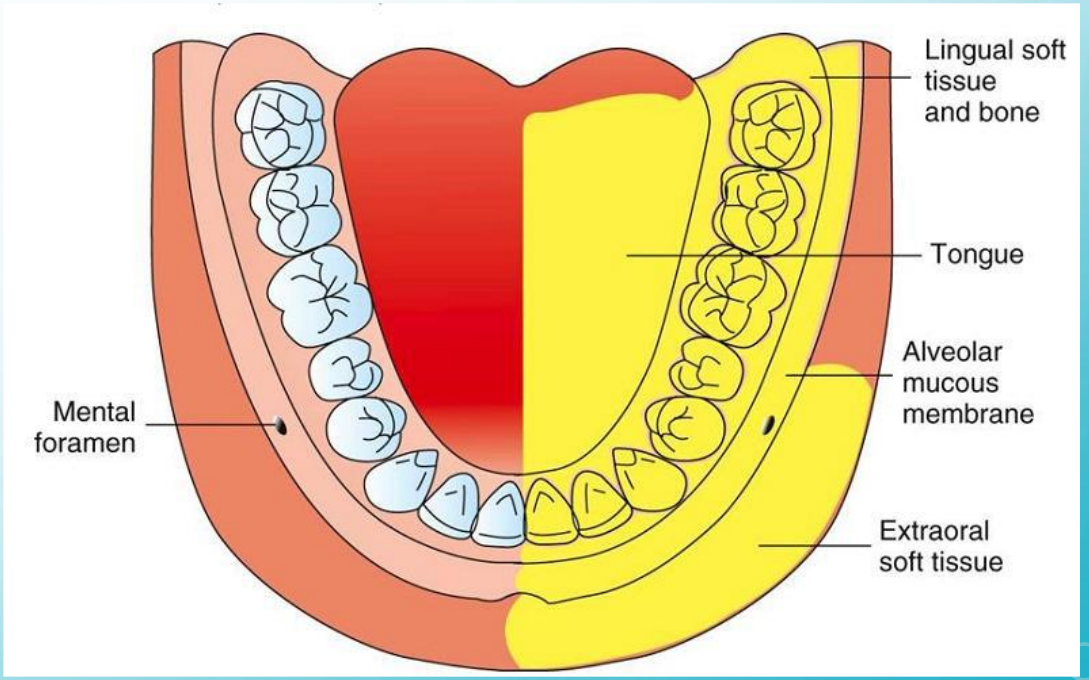
GOW-GATES TECHNIQUE

- high success rate: approximately 99%
- true mandibular nerve block because it provides sensory anesthesia to virtually the entire distribution of V3
  - inferior alveolar,
  - lingual,
  - mylohyoid,
  - mental,
  - incisive,
  - Auriculotemporal
  - Buccal nerves

GOW-GATES TECHNIQUE

Areas Anesthetized

- Mandibular teeth to the midline
- Buccal mucoperiosteum and mucous membranes on the side of injection
- Anterior two thirds of the tongue and floor of the oral cavity
- Lingual soft tissues and periosteum
- Body of the mandible, inferior portion of the ramus
- Skin over the zygoma, posterior portion of the cheek, and temporal regions



GOW-GATES TECHNIQUE

Indications

- –Multiple procedures on mandibular teeth
- –When buccal soft tissue anesthesia, from the third molar to the midline, is necessary
- –When lingual soft tissue anesthesia is necessary
- –When a conventional inferior alveolar nerve block is unsuccessful

Contraindications

- –Infection or acute inflammation in the area of injection (rare)
- –Patients who might bite their lip or their tongue, such as young children and physically or mentally handicapped adults
- –Patients who are unable to open their mouth wide (e.g., trismus)

GOW-GATES TECHNIQUE

Advantages

- Requires only one injection; a buccal nerve block is usually unnecessary (accessory innervation has been blocked)
- High success rate (>95%), with experience
- Minimum aspiration rate
- Few postinjection complications (e.g., trismus)
- Provides successful anesthesia where a bifid inferior alveolar nerve and bifid mandibular canals are present

GOW-GATES TECHNIQUE

Disadvantages

- Lingual and lower lip anesthesia is uncomfortable for many patients and is possibly dangerous for certain individuals.
- The time to onset of anesthesia is somewhat longer (5 minutes) than with an IANB (3 to 5 minutes), primarily because of the size of the nerve trunk being anesthetized and the distance of the nerve trunk from the deposition site (approximately 5 to 10 mm).
- There is a **learning curve** with the Gow-Gates technique –requires experience

GOW-GATES TECHNIQUE

- **Positive Aspiration** 2%.

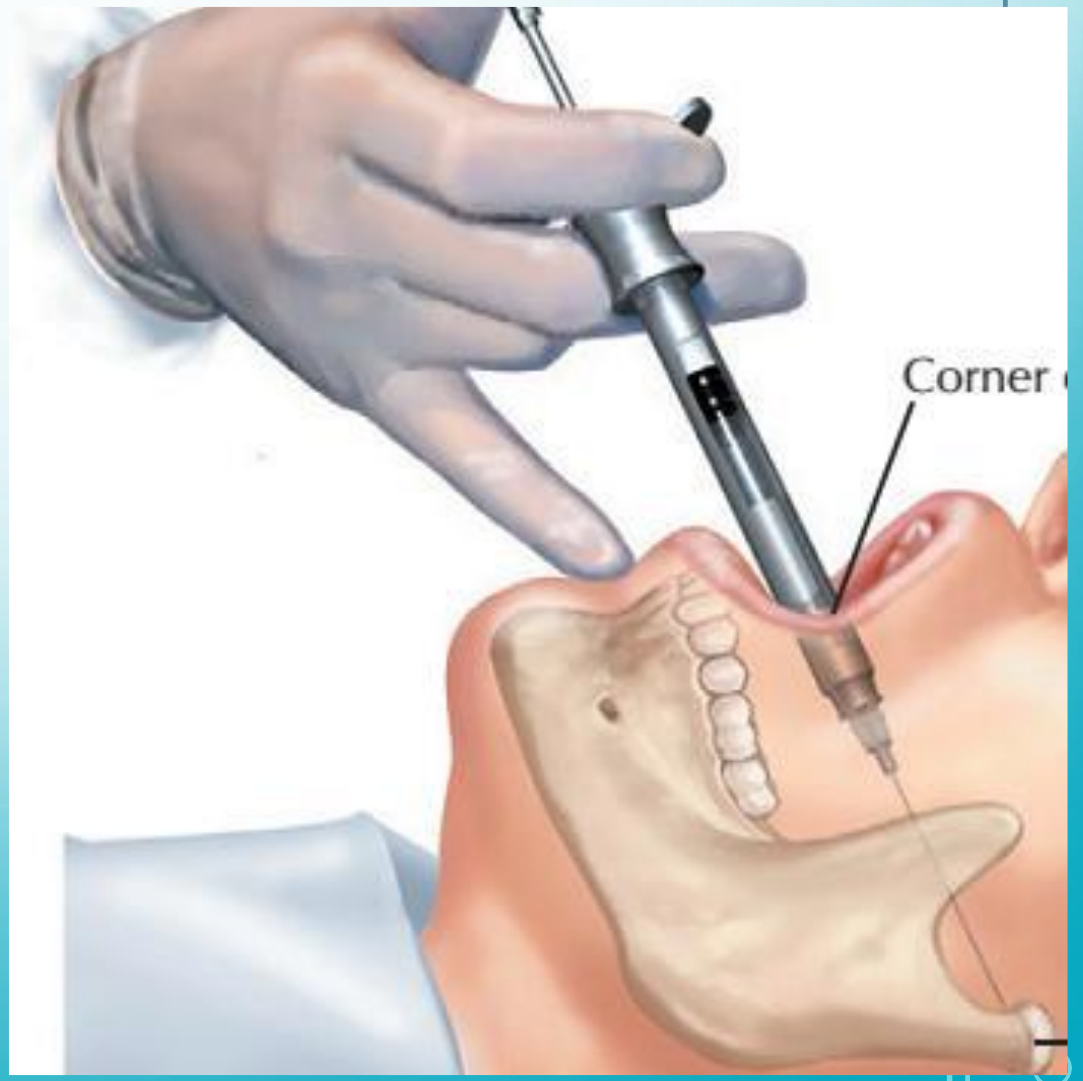
Alternatives

- IANB and buccal nerve block
- Vazirani-Akinosi closed-mouth mandibular block
- Incisive nerve block
- Mental nerve block
- Buccal nerve block
- Supraperiosteal injection

GOW-GATES TECHNIQUE

Technique

- The mouth is opened as wide as possible
- Insert the needle high into the mucosa at the level of the 2nd maxillary molar just distal to the mesiolingual cusp
- Use the intertragic notch as an extraoral landmark to help reach the neck of the mandibular condyle



GOW-GATES TECHNIQUE

Technique

- Advance the needle in a plane from the corner of the mouth to the intertragicnotch from the contralateralpremolars (this position varies in accordance withindividual flare of the mandible) until it contacts the condylarneck
- Withdraw the needle slightly and perform aspiration to observe whether the needle is in a blood vessel
- After a negative result on aspiration, slowly inject the anesthetic
- Have the patient keep the mouth open for a few minutes after injection, to allowthe anesthetic to diffuse around the nerves

VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

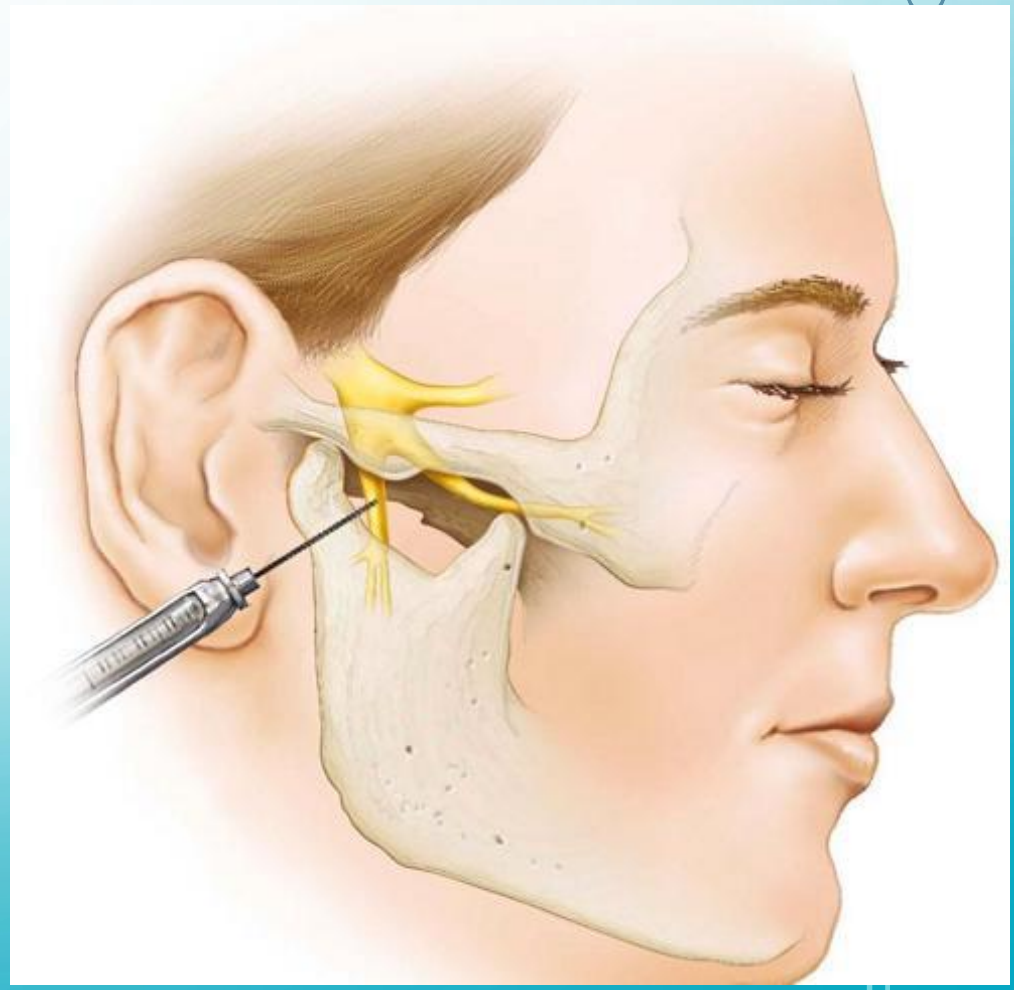
Also known as tuberosity technique

- primary indication remains those situations where

limited mandibular opening.

Nerves Anesthetized

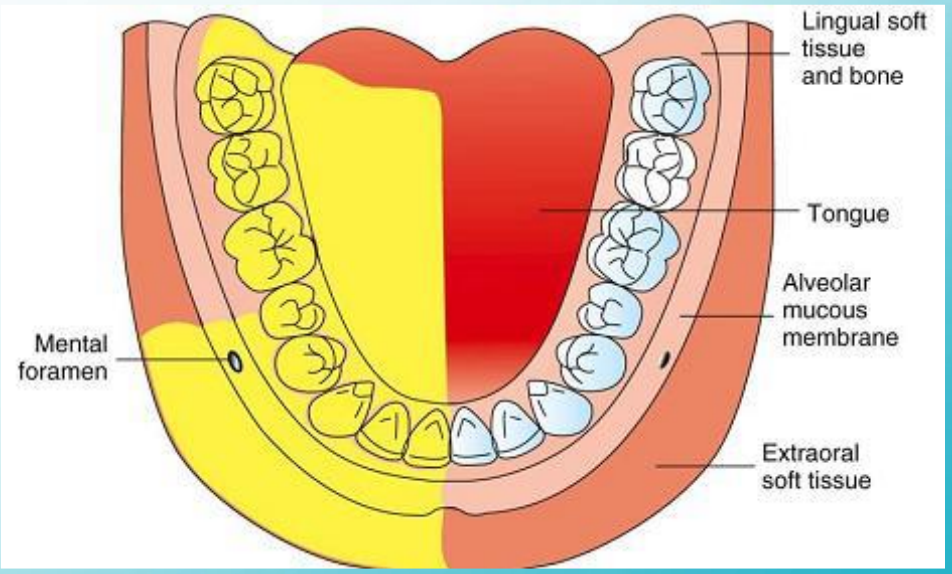
- Inferior alveolar
- Incisive
- Mental
- Lingual
- Mylohyoid



VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

Areas Anesthetized

- Mandibular teeth to the midline
- Body of the mandible and inferior portion of the ramus
- Buccal mucoperiosteum and mucous membrane anterior to the mental foramen
- Anterior two thirds of the tongue and floor of the oral cavity (lingual nerve)
- Lingual soft tissues and periosteum(lingual nerve)



VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

Indications

- Limited mandibular opening
- Multiple procedures on mandibular teeth
- Inability to visualize landmarks for IANB (e.g., because of large tongue)

Contraindications

- Infection or acute inflammation in the area of injection (rare)
- Patients who might bite their lip or their tongue, such as young children and physically or mentally handicapped adults
- Inability to visualize or gain access to the lingual aspect of the ramus

VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

Advantages

- –Relatively atraumatic
- –Patient need not be able to open the mouth.
- –Fewer postoperative complications (e.g., trismus)
- –Lower aspiration rate (<10%) than with the inferior alveolar nerve block
- –Provides successful anesthesia where a bifid inferior alveolar nerve and bifid mandibular canals are present

Disadvantages

- –Difficult to visualize the path of the needle and the depth of insertion
- –No bony contact; depth of penetration somewhat arbitrary
- –Potentially traumatic if the needle is too close to the periosteum

VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

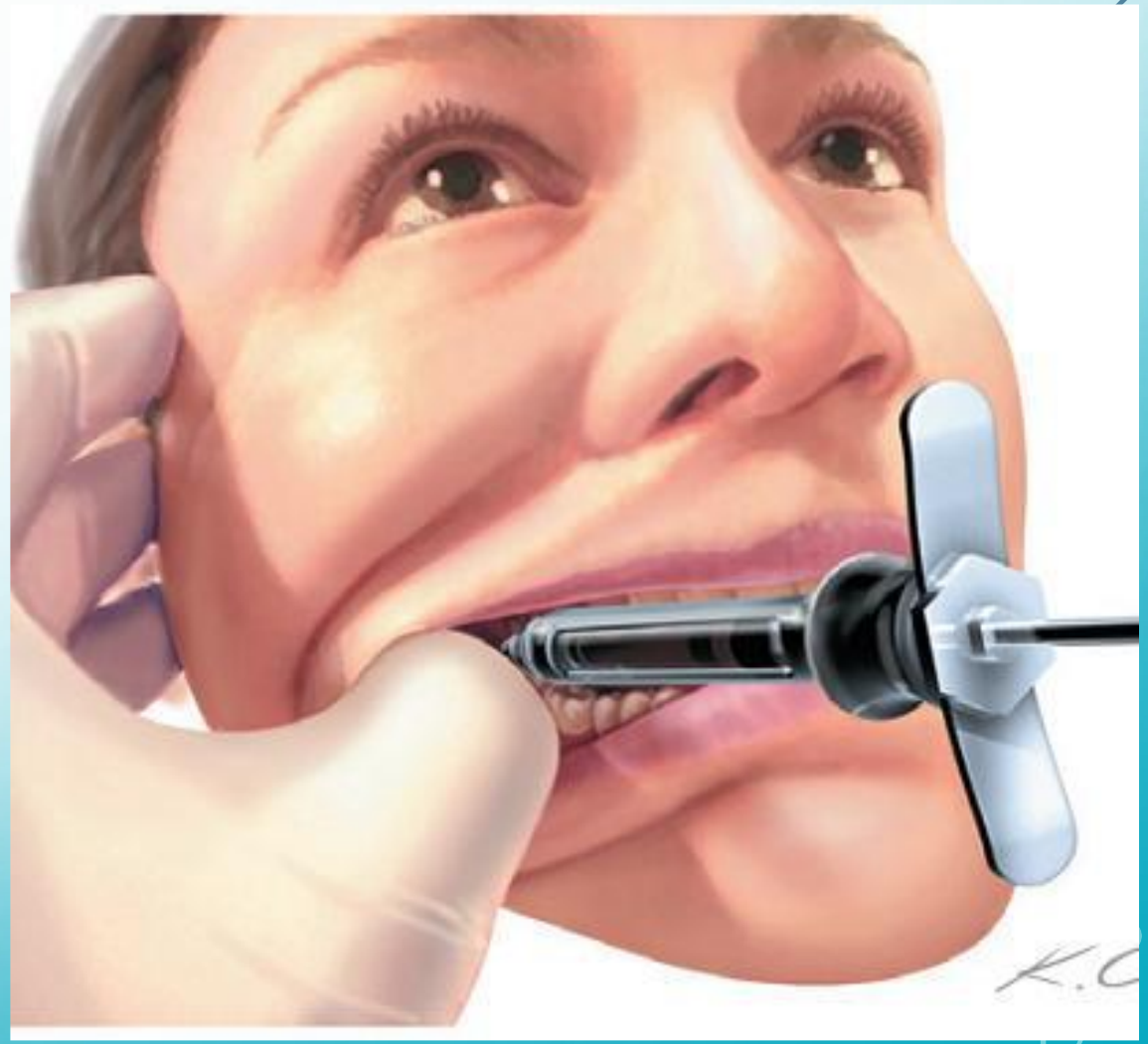
Complications

- Hematoma (<10%)
- Trismus(rare)
- Transient facial nerve (VII) paralysis

VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

Technique

- Have the patient close the mouth
- Insert the needle into the mucosa between the medial border of the mandibular ramus and the maxillary tuberosity at the level of the cervical margin of the maxillary molars



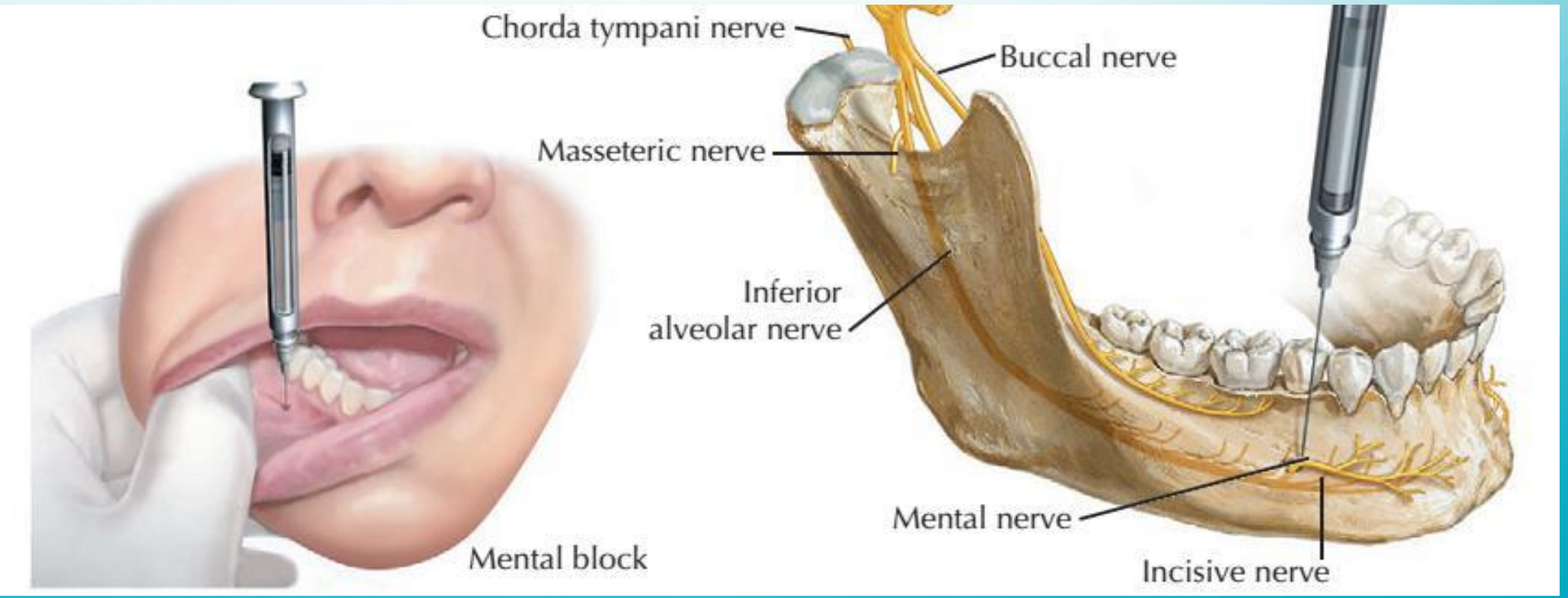
VAZIRANI-AKINOSI CLOSED-MOUTH MANDIBULAR BLOCK

Technique

- Advance the needle parallel to the maxillary occlusalplane
- Once the needle is advanced approximately 23 to 25mm, it should be located in the middle of the pterygomandibularspace near the inferior alveolar and lingual nerves (*note:* no bone will be contacted)
- After a negative result on aspiration, slowly inject the anesthetic

MENTAL NERVE BLOCK

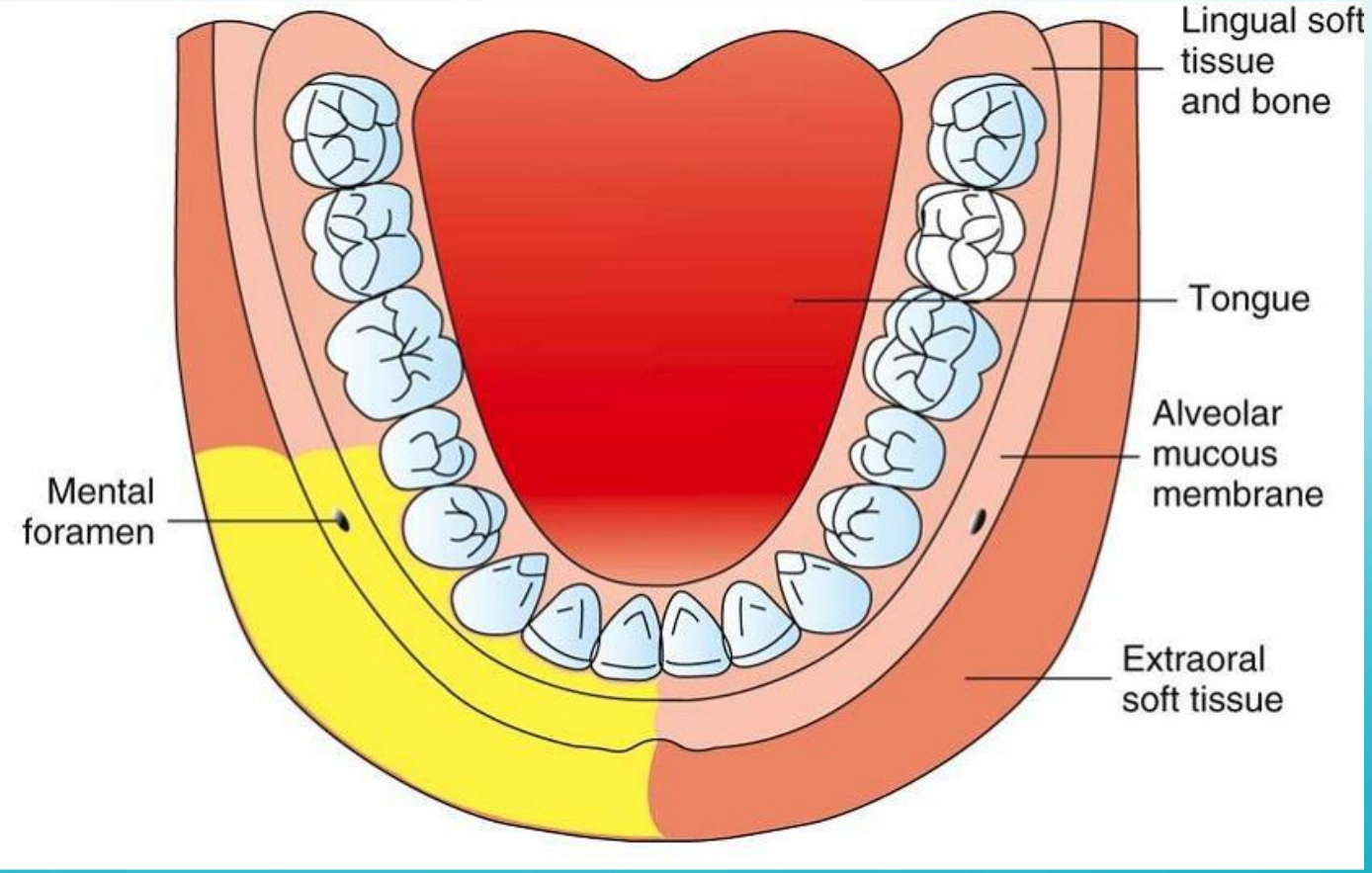
- Terminal branch of IAN as it exits mental foramen
- Provides sensory innervation to buccal soft tissue anterior to mental foramen, lip and chin



MENTAL NERVE BLOCK

Areas Anesthetized

- Buccal mucous membranes anterior to the mental foramen (around the second premolar) to the midline and skin of the lower lip and chin



MENTAL NERVE BLOCK

Indication

- Soft tissue biopsies
- Suturing of soft tissues

Contraindication

- Infection/inflammation at injection site

Advantages

- Easy, high success rate
- Usually atraumatic

Disadvantage

- Hematoma

MENTAL NERVE BLOCK

Alternatives

- Local infiltration
- PDL
- Intraseptal
- Inferior alveolar nerve block
- GowGates

MENTAL NERVE BLOCK

Technique

- Locate the mental foramen via palpation
- Insert the needle into the mucosa at the mucobuccal fold at the location of the mental foramen (normally around the 2nd mandibular premolar)
- Perform aspiration; after a negative result, slowly inject the anesthetic

INCISIVE NERVE BLOCK

Terminal branch of IAN

- •Originates in mental foramen and proceeds anteriorly
- •Good for bilateral anterior anesthesia
- •Not effective for anterior lingual anesthesia

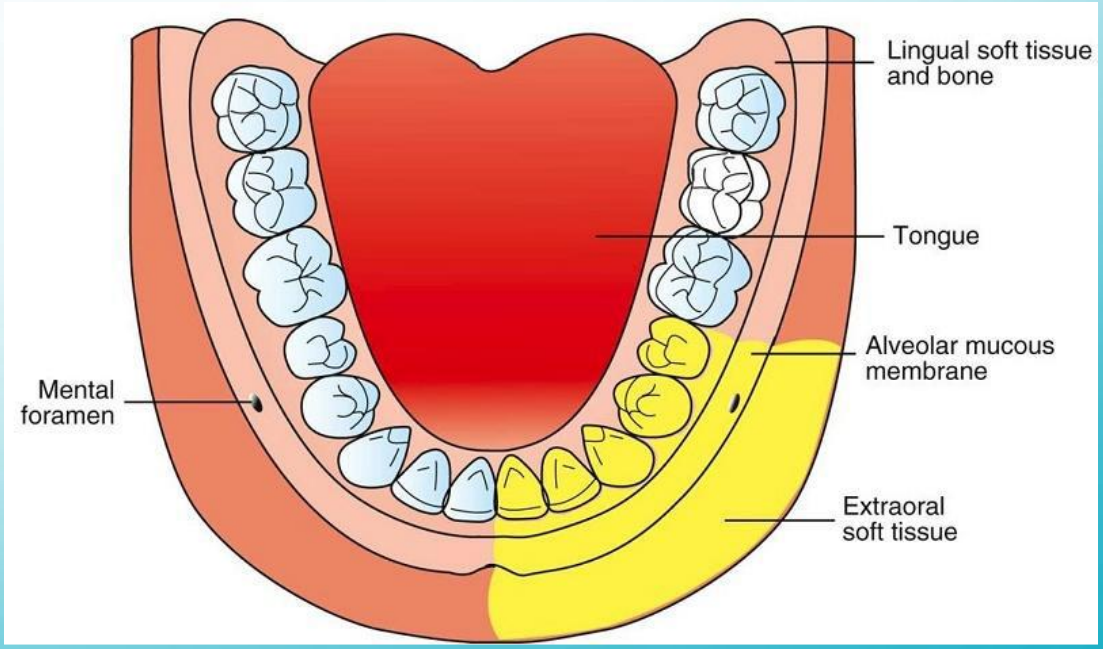
Nerves anesthetized

- –Incisive
- –Mental

INCISIVE NERVE BLOCK

Areas Anesthetized

- •Mandibularlabial mucous membranes
- •Lower lip / skin of chin
- •Incisor, cuspidand bicuspid teeth



INCISIVE NERVE BLOCK

Indication

- Anesthesia of pulp or tissue required anterior to mental foramen

Contraindication

- Infection/inflammation at injection site

Advantages

- High success rate
- Pulpal anesthesia w/o lingual anesthesia

Disadvantages

- Lack of lingual or midline anesthesia

INCISIVE NERVE BLOCK

- Complications :Hematoma
- Positive aspiration: 5.7 %