



Local Anesthesia Resource

Injection	Penetration Site	Anatomical Considerations	Deposition Site & Anesthesia
ASA	Height of the mucobuccal fold anterior to the canine eminence in the canine fossa.	Deposition Site: above the canine eminence. Contact with bone should be avoided.	Depth of injection is 3-6mm. ½ cartridge is deposited.
MSA	Height of the mucobuccal fold over the maxillary second premolar. *Malamed suggests between the two premolars	Deposition Site: Well above the apex of the second premolar. Several clinicians approach the deposition site between the apices of the two premolars.	Depth of injection is 5-8mm. ½-2/3 cartridge is deposited.
PSA	Height of the mucobuccal fold posterior to the zygomatic process of the maxilla and generally superior to the distobuccal root of the second molar.	Deposition Site: adjacent to the foramina for the PSA nerve branches on the posterior surface of the maxilla	Depth of injection is 16mm for most adults; 10-14mm on children and small adults. Deposit ½ to a full cartridge of solution.
IO	Height of the mucobuccal fold in direct vertical alignment with the infraorbital notch and subsequently the infraorbital foramen. Anatomy is assessed utilizing palpation techniques.	Superficial to the infraorbital foramen, directly below the infraorbital notch.	Contact with bone is controversial but ensures contact with the infraorbital ridge. ½ a cartridge is deposited. Finger pressure is applied extraorally for 1-2 minutes

GP	Palatal soft tissues slightly anterior to the greater palatine foramen at the anterior border of the depression.	Deposition Site: Anterior to the opening of the anterior palatine foramen.	Advance 4-10mm until gentle contact with bone. Deposit ¼ of a cartridge.
NP	Palatal mucosa lateral to the widest anteroposterior dimension of the incisive papilla	Deposition Site: At the center of the incisive canal	Insert 4-7mm; contact the opposite wall of the foramen. Deposit ¼ of a cartridge.
IA	Lateral to the pterygomandibular raphe at the height (2-3mm superior) of the coronoid notch and medial to the internal oblique ridge.	Deposition Site: 1mm lateral to the medial aspect of the ramus and above the mandibular foramen.	Deposition at about 2/3-3/4 of a long needle, until boney resistance is met. Deposit ¾ of a cartridge *budget for Lingual and Buccal.
Lingual	Same as Inferior Alveolar Block	Deposition Site: Halfway point between the ramus and the penetration site for the Inferior Alveolar Block, medial and anterior to the Inferior Alveolar Nerve.	Depth is ½ the length of the Inferior Alveolar Block, approximately 10-13mm. Approximately one stopper-ful is budgeted for the Lingual.
Buccal	Buccal fold just distal and buccal to the most posterior molar for which soft tissue anesthesia is required.	Deposition Site: At the buccal aspect of the ramus lateral to the external oblique ridge.	Angle of insertion is parallel to the occlusal plane, Insertion depth is 3-4mm. Deposit remaining stopper-ful of solution.
Mylohyoid	The lingual mucosa below the apex of the tooth immediately posterior to the tooth requiring supplemental anesthesia	At the mesiolingual apex of the tooth just posterior to the one requiring supplemental anesthesia.	Retract the tongue, Penetrate until boney contact is met. Insertion depth: 3-5mm. Deposit 1/3 cartridge of solution.
Mental	Based on the location of the mental foramen located via palpation and radiographs.	Deposition Site: Slightly superior to the mental foramen.	h is typically 4-6mm, bone should not be contacted. Deposit 1/3 of a cartridge.

Incisive	Varies based on the location of the mental foramen located via palpation and radiographs.	Deposition Site: Slightly superior to the mental foramen.	Depth is typically 4-6mm, bone should not be contacted. Deposit 1/3 of a cartridge. Apply postoperative pressure for 1-2 minutes.
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Alternative Injection Techniques

Maxillary, Palatal and Mandibular injection techniques for consideration. Note: it is important that the clinician ensure they have reviewed all anatomical considerations, depths, angles and anesthetic considerations prior to delivering an alternative injection on a live patient.

Injection	Structures	Penetration Site	Anatomical Considerations	Deposition Site & Anesthesia
AMSA	Central, canine, lateral, premolars. Periodontium to incisors and premolars, palatal to molars	Between the premolars approximately halfway from the median palatine raphe to the gingival margin on the side to be anesthetized. Described as the junction of the vertical and horizontal aspects of the palate.	Deposition Site: Near the junction of the alveolar process and palatal process ensuring adequate tissue thickness for accommodation of solution.	Insertion at a 45 degree angle until contact with bone. Deposit 1/2 to 2/3 of a cartridge. Observe for blanching.
PASA	Central, lateral, canine. Periodontium of affected teeth	Palatal mucosa at the widest anteroposterior dimension of the incisive papilla	Deposition Site: through the incisive papilla. Needle advances superiorly into the canal until penetrated depth within the incisive canal.	Depth of 6-10mm. Deposit 2/3 of a cartridge. Rate of deposition modification: .5mL over 60 seconds.

V2-Palatal	Hemimaxillary	Site of the greater palatine foramen	Deposition Site: the trunk of the maxillary nerve as it remains within the pterygopalatine fossa prior to the nerve entrance into the cranium by the foramen rotundum.	Locate anterior depression of the greater palatine foramen, use a long needle, advance through the slope of the greater palatine canal to optimal depth of 30mm. Deposit 1.8mL of solution.
PDL	Individual tooth at injection site	Within the sulcus that surrounds a tooth. Multiple sites should be selected to ensure adequate delivery of anesthesia.	Procedure: Insert between the roots of a tooth or to the base of the periodontal attachment; until resistance is met	Deposit 1 stopper-ful
Intraseptal	Soft tissues and periodontium at site of injection	At the center of the papilla adjacent to the tooth to be treated and below the height of the interdental papilla but within the attached gingiva.	Deposition Site: Just inside the cortical plate of bone, no perforation is made in the bone before needle insertion.	Advance until boney resistance is met, deposit within the septum 1-2 stopper-fuls of solution.
Mandibular infiltration w Articaine	Individual tooth at injection site	Deliver in the mucobuccal fold over the apex of each root.	Most effective delivery occurs when both buccal and lingual approaches are used	Penetrate into the mucobuccal fold between 3-6mm, deposit 1/3-1/2 a cartridge
Gow-Gates	Hemimandibular	Buccal mucous membrane directly posterior to the maxillary second molar at the level of the mesiolingual cusp. Location varies based on use	Deposition Site: Anterolateral surface of the neck of the condyle at the insertion of the lateral pterygoid muscle.	Advance to a depth of 25mm in an up and back movement until boney resistance is met. Deposit one full

		of landmarks. Extraoral: Line visualized from the intertragic notch to the labial commissure.		cartridge of solution. Pt must remain open postoperatively for 2-5 minutes
V-A	Hemimandibular	In the soft tissue medial to the ramus, directly adjacent to the maxillary tuberosity at the height of the mucogingival junction of the maxillary molars.	Deposition Site: Above the mandibular foramen on the medial surface of the ramus in the pterygomandibular space.	Retract to reveal the penetration site and have patient close. Angulation is parallel to mandibular molars. Advance 25mm and deposit one full cartridge.

Notes:

