Local blockade of the nerves serving the oral cavity and face in the dog and cat requires simple equipment and material readily available at any veterinary practice, syringes and thin needles. Needle size can vary from 25-gauge to 30-gauge, 12 mm, 25 mm, or 36 mm in length.

Procedures for which locoregional anesthesia may be indicated include:

- Dental extractions
- Periodontal flap surgery
- Endodontic procedures
- Restorative procedures
- Implant surgery
- Oronasal fistulas
- Palatal defect (cleft palate) closure
- Maxillary and mandibular fracture repairs
- Posttraumatic soft-tissue reconstruction
- Oncologic surgery with excision of hard (i.e., maxillectomy, mandibulectomy) and soft tissue (i.e., glossectomy, palatectomy).

Anatomy

The majority of the sensory innervation of the teeth, bone, and soft tissue of the oral cavity and the facial skin is provided by the right and left trigeminal nerves (V). The three branches of the sensory root (ophthalmic [V₁], maxillary [V₂] and mandibular [V₃] branches) supply the skin of the face and the mucous membranes of the eyes, nose, and oral cavity, except for the pharynx and the base of the tongue.

The maxillary branch runs through the round foramen, the alar canal, and the rostral alar foramen into the caudal portion of the pterygopalatine fossa, and then courses rostrally on the dorsal surface of the medial pterygoid muscle. In the rostral part of the pterygopalatine fossa it leaves off the zygomatic and the pterygopalatine nerves and continues as the infraorbital nerve into the maxillary foramen and the infraorbital canal. During its course within the canal, the infraorbital nerve gives off branches to supply the maxillary teeth.

The infraorbital nerve exits from the infraorbital foramen and divides into external and internal nasal branches and superior labial branches, supplying the soft tissues of the rostral portion of the face.

The mandibular branch (V₃) of the trigeminal nerve is motor to the muscles of mastication and the mylohyoideus muscle, and sensory to the hard and soft tissues of the mandible (including the mandibular teeth, the buccal mucosa, and the lower lip), the tongue, part of the skin of the head, and the mucosa of the intraosseous part of the external ear canal. Its major branches (of interest in dentistry) are the buccal nerve (skin and mucosa of the cheek), the inferior alveolar nerve (mandibular teeth, the rostral lip, and the rostral intermandibular region), the mylohyoid nerve (rostral belly of the digastricus muscle, the skin of the lower lip and cheek, the mylohyoideus muscle, and the caudal intermandibular region), and the lingual nerve (sensory to the rostral two-thirds of the tongue, the buccal mucosa of the isthmus of the fauces, and the sublingual mucosa).

The mental nerves leave the inferior alveolar nerve in the rostral portion of the mandible and exit through the caudal, middle, and rostral mental foramina to supply the rostral lower lip and the rostral intermandibular region. The foramina are located on the lateral aspect of the mandible, ventral to the third premolar tooth, ventral to the mesial root of the second premolar tooth, and ventral to the first incisor tooth, respectively.

Maxillary Foramen Block

Indications

This block is useful for dental procedures on any maxillary tooth or in major surgical procedures on the hard and soft tissues of the ipsilateral maxilla.
**Landmarks**
The maxillary nerve block may be performed by using a transcutaneous approach, with insertion of the needle between the caudal margin of the maxilla and the coronoid process of the mandible, below the rostroventral border of the zygomatic arch.

**Technique (Subzygomatic Approach)**
The needle is inserted perpendicularly to the skin surface and advanced a short distance (dictated by the size of the patient) to reach the pterygopalatine fossa and the maxillary nerve. The nerve runs close to the maxillary artery medial to the zygomatic arch, ventral to the ocular globe, dorsomedial to the zygomatic salivary gland, and dorsal to the maxillary tuberosity and the maxillary molar teeth. The deep facial vein can also be found in the vicinity and therefore extreme caution needs to be taken.

**Infraorbital Nerve Block**

**Indications**
This block is used in procedures performed on any maxillary tooth or when major surgical procedures on the hard and soft tissues of the ipsilateral maxilla are performed. It needs to be noted that placement of the anesthetic agent outside the infraorbital foramen will only anesthetize the skin of the muzzle and the upper lip.

**Landmarks**
The infraorbital foramen is on the lateral side of the maxilla, rostroventrally to the eye, dorsal to the distal root of the maxillary third premolar tooth. In dogs, it can normally be palpated through the skin or vestibular mucosa at mid-height of the maxilla. In cats, the foramen is just ventral to the ventral margin of the orbit, where a clear bony ridge (the lateral wall of the foramen) may be palpated.

**Technique**
The thumb of the nondominant hand is placed on the foramen, and the needle is inserted underneath it to engage into the foramen itself.

**Inferior Alveolar Nerve Block**

**Indications**
This block is used when any mandibular tooth, the rostral lower lip, and the rostral intermandibular region will be anesthetized (lingual and buccal branches are needed for complete desensitization of the lingual and buccal mucosa, respectively).

**Landmarks**
The local anesthetic solution should be located next to the mandibular foramen, on the medial side of the mandible, ventral to the attachment of the temporalis muscle and rostral to the belly of medial pterygoid muscle. The foramen can be found midway through an imaginary line drawn between the angular process of the mandible and the last molar tooth, from 0.5 cm (cats and small dogs) to 2 cm (large dogs) dorsal to the facial vascular notch, a slight concavity of the ventral margin of the mandibular ramus that is just rostral to the angular process.

**Technique (Intraoral Approach)**
Palpate the internal ridge of the coronoid process. The puncture site is the pterigotemporal depression, lateral to the pterigomandibular rafe. The needle is then advanced through the mucosa medial to the mandible at the level of the last mandibular molar tooth. The needle is directed ventrocaudally toward the angular process.

**Possible Complications**
It is possible that with the inferior alveolar nerve block, the lingual nerve can be desensitized as well. In this case, self-inflicted chewing injuries may be possible in the recovery period until normal sensation reappears. However, this is a rather rare event, possibly because the motor function of the tongue, regulated by the lingual muscles that are innervated by the hypoglossal nerve, is maintained.
**Mental Foramen Block**

**Indications**
Injecting an anesthetic solution next to the middle mental foramen (the largest mental foramen in both dogs and cats) will block the middle mental nerve and anesthetize most of the rostral labial soft tissues of the lower jaw. The middle mental nerve block is useful when surgery is performed on the rostral lower lip. Whenever it is necessary to anesthetize the rostral mandibular teeth, too, however, an inferior alveolar nerve block (either caudal or rostral) should be performed. The mucogingival tissues lingual to the mandible are not anesthetized with either a mental or a rostral inferior alveolar nerve block. In case this is desired, a caudal inferior alveolar nerve block (and concomitant lingual nerve block) should be performed instead.

**Landmarks**
In dogs, the middle mental foramen is located ventral to the mesial root of the second premolar tooth at the level of the canine’s root apex, at mid-height of the mandibular body or slightly closer to the ventral margin of the mandible than to the alveolar margin.

In cats the middle mental foramen is located equidistant between the third premolar tooth (the first tooth after the canine tooth in cats) and the canine tooth, under the lip frenulum, at mid-height of the mandible.

**Technique**
While palpating the foramen, the needle should be inserted through the skin or the mucosa of the labial frenulum, in a caudal, slightly medial direction, to reach the foramen, between the finger and the bony surface.

**Infiltration Anesthesia**
Infiltration anesthesia is achieved by injecting the local anesthetic solution under the oral mucosa, just above the apex of the tooth of interest. In areas of thin cortical bone (i.e., rostral mandible and maxilla), the anesthetic agent will diffuse through the bone and anesthetize the pulp tissues.