SMALL ANIMAL LOCAL AND REGIONAL ANESTHESIA

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INTRODUCTION

Local and regional anesthetic techniques are an important adjunct to anesthesia. Desensitizing the surgical site reduces general anesthetic requirements with a subsequent improvement in cardiovascular function, and provides pre-emptive and post-operative analgesia, reducing the need for systemic analgesics and enhancing patient comfort. In addition to their physiologic benefits, local blocks are cost-effective and easy to perform.

LOCAL ANESTHETICS

Local Anesthetic	Onset time	Duration	Common Clinical Dose	Maximum Dose*
Lidocaine	5-15 mins	1-2 hr	4 mg/kg	Dog: 10 mg/kg Cat: 5 mg/kg
Bupivacaine	15-30 mins	4-6 hr	1 mg/kg	Dog: 3 mg/kg Cat: 2 mg/kg
Mepivacaine	5-15 min	1.5-3 hr	4 mg/kg	Dog: 10 mg/kg Cat: 5 mg/kg

***Toxicity**

Maximum dose and toxicity depends on route of administration, site of injection, uptake rate, age, physiologic status and species. Cats are more sensitive to local anesthetics, with toxic doses being approximately half that of dogs. The amount of lidocaine used to desensitize the larynx in cats should be considered when calculating additional volumes of local anesthetic, particularly in smaller patients. Bupivacaine is more cardiotoxic than lidocaine and should never be administered intravenously.

Signs of toxicity for local anesthetics include neurological and cardiovascular signs. Neurological signs begin with sedation and progress to twitching, coma and respiratory arrest, while the cardiac effects manifest as arrhythmias, bradycardia, vasodilation and cardiac arrest. Lidocaine toxicity produces more neurological signs, while bupivacaine is more cardiotoxic.

Local anesthetic toxicity can be treated with intravenous lipid administration (1-4 mL/kg) over 30 minutes to absorb the anesthetic, as well as supportive therapy, including intravenous fluid therapy, oxygen administration, mechanical ventilation and appropriate cardiovascular support (inotropes and vasopressors).

CONTRAINDICATIONS

Regional anesthesia has many indications, with use more limited by contraindications.

Contraindications for infiltration	Contraindications for epidural injection
- Infection at the injection site - Extensive fibrosis of injection site - Epinephrine containing local anesthetic at areas without collateral circulation - Hypersensitivity to local anesthetic (rare)	- Coagulopathy - Uncorrected hypovolemia or hypotension, or cardiac disease where hypotension cannot be safely accommodated (for epidurals containing local anesthetics) - Infection or neoplasia at the injection site - Sepsis or Bacteremia - Anatomical disruption to landmarks

DENTAL BLOCKS

There are 4 dental blocks that can desensitize most areas of the mouth, maxilla and mandible.

Volumes

Generally 0.1-1.0 mL of local anesthetic can be deposited per site depending on size of the patient, tissue capacity and safe doses for the animal.

General Technique

The majority of dental blocks are performed as nerves exit their foramen along with an artery and vein. The needle can be inserted into the foramen before injecting, but increases the risk of hitting a blood vessel or damaging the nerve. An alternative method is to insert only the tip of the needle to the opening of the foramen and inject. Placing firm digital pressure over the foramen and injection site during and after injection will force local anesthetic deeper into the foramen minimizing the risk of needle trauma. It is important to aspirate and ensure the absence of blood before administration to avoid intravascular injection.

Complications

- Hemorrhage: In the case of the infraorbital block, puncture of an artery can cause hemorrhage behind the globe and proptosis. Apply firm pressure if a vessel is inadvertently punctured.
- Intravascular injection: Aspirating carefully before injection to ensure the absence of blood in the needle will greatly minimize the risk of intravascular injection. Intravascular injection will result in block failure and systemic effects from the local anesthetic
- Neuropraxia: Advancing a large needle into a foramen may lacerate the nerve causing damage. Injection into the nerve itself can cause nerve damage and pain – Do not inject against notable resistance, it may indicate the needle is within the nerve sheath
- Ocular trauma: In the case of the infraorbital nerve block, advancing too far into the infraorbital canal can result in direct ocular trauma from the needle. Cats and brachycephalics are more at risk.

INFRAORBITAL NERVE BLOCK

Structures Desensitized

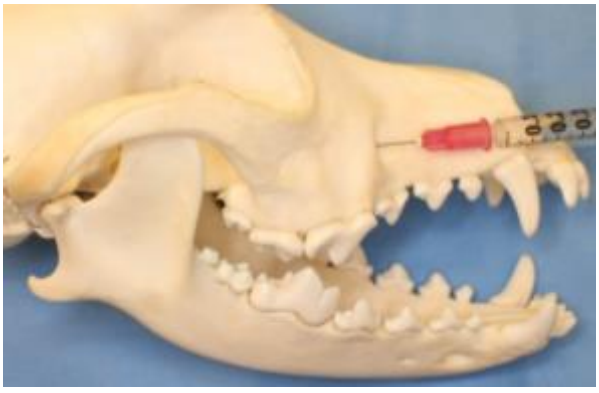
The area desensitized depends on how far caudally the local anesthetic travels within the infraorbital canal. A superficial block (local only deposited at the opening of the canal) will desensitize the maxillary teeth rostral to the foramen and surrounding soft tissue/gingiva, upper lip, and nose. If local anesthetic travels further caudally within the canal, the maxillary teeth can be desensitized as well as the surrounding soft tissue/gingiva, upper lip, nose; however, it is less reliable desensitizing caudal structures than the maxillary nerve block.

Anatomy

- The *infraorbital nerve* exits the *infraorbital foramen* along with the infraorbital artery and vein. The foramen is located approximately dorsal to the 3rd premolar (dogs) or 2nd premolar (cats).
- The infraorbital nerve sends off the *caudal, middle and rostral superior alveolar nerves* within the infraorbital canal to innervate the maxillary teeth. Injection of local anesthetic further into the canal (toward the orbit) will block more caudally located teeth, while injection of anesthetic superficially into the canal will not.

How to Perform the Block

- Palpate the infraorbital foramen intra- or extra-orally. It can be localized as the depression midway between the medial canthus of the eye and the base of the canine tooth in the dog.
- Insert a 23-25 Ga needle into the opening of the foramen (no further than the width of the 4th premolar) or apply firm digital pressure to force local anesthetic into the foramen.
- **CAUTION**: Brachycephalic breeds and cats have a short infraorbital canal, and advancing the needle into the canal can cause ocular/neurological trauma or hemorrhage with proptosis of the globe. Do not advance the needle beyond the opening of the foramen in these animals, and just use digital pressure instead to direct the local anesthetic into the canal.



MAXILLARY NERVE BLOCK

Structures Desensitized

The maxillary block provides ipsilateral desensitization of all teeth (including molars), nose, upper lip, maxilla, as well as the hard palate.

Anatomy

- The *maxillary nerve* gives off the zygomatic and pterygopalatine nerves and then forms the infraorbital nerve which enters the maxillary foramen to travel in the infraorbital canal and exits at the infraorbital foramen.
- The maxillary block will desensitize the following nerves before they enter their foramina:
    - *Infraorbital nerve* – Innervates the teeth, nose and lips
    - *Pterygopalatine nerve* – Innervates the nasal cavity and palate

How to Perform the Block

Oral approach

- Open the mouth wide and retract lips at the lateral commissure
- Insert a 23-25 Ga needle dorsally immediately caudal to the 2nd molar and advance it 2-4 mm depending on the size of the patient.
- Inject local anesthetic after a negative aspiration.

Percutaneous approach

- Palpate the zygomatic arch near the lateral canthus
- Insert the needle perpendicular to the skin just ventral to the zygomatic arch at its rostral border. Insert the needle to the level of the pterygopalatine fossa and maxillary nerve.

MENTAL NERVE BLOCK

Structures Desensitized

The extent of desensitization depends on how far caudally the anesthetic spreads from the opening of the mental foramen.

- Superficial block – Desensitizes only soft tissue from the canine to rostral midline
- Deep block – Desensitizes the soft tissue and ipsilateral canine and incisors

In small patients, caudal spread of local anesthetic is difficult to achieve given the size of the foramen, and an inferior alveolar nerve block is often used instead.

Anatomy

- The *caudal, middle and rostral mental nerves* branch from the *inferior alveolar nerve* within the body of the mandible. They emerge from their respective mental foramina, which are located on the lateral aspect of the rostral mandible.
- A superficial block desensitizes the emerging mental nerve, while the deep block desensitizes the rostral part of the infraorbital nerve before the mental nerve arises.
- There are 3 *mental foramina*, the middle of which is the largest and the landmark for the block
    - It can be palpated on the lateral aspect of the mandible in many medium to larger sized dogs, but can be difficult to palpate in cats and small dogs
    - Location in dogs: Ventral to the 1st or 2nd premolar
    - Location in cats: Half-way between the canine tooth and 3rd premolar (mid way in the diastema)

How to Perform the Block

- Palpate the middle mental foramen or locate the landmarks if it cannot be palpated.
- Insert a small needle to the opening and either advance it into the foramen or inject superficially while applying digital pressure to facilitate caudal spread of local anesthetic.
- Always aspirate before injecting.

INFERIOR ALVEOLAR NERVE BLOCK

Structures Desensitized

This block desensitizes the hemimandible and lower lip. It provides more reliable anesthesia to the lower incisors and canine than the mental nerve block.

Anatomy

- The *inferior alveolar nerve* is a branch of the *mandibular nerve*, and is blocked before it enters the *mandibular foramen*.
- The mandibular foramen is located on the medial aspect of the body of the mandible at the level of the mandibular notch, a half to a third of the way up the mandible.
- The *mental nerve* is a branch of the inferior alveolar nerve, thus this block will desensitize areas covered by the mental block.

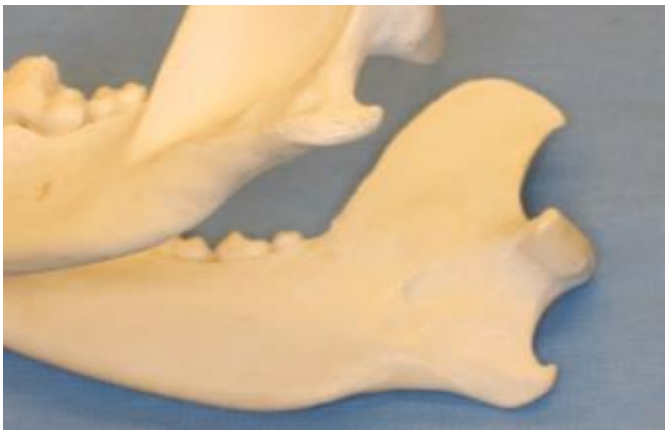
How to Perform the Block

Oral approach

- Palpate the mandibular foramen deep within the mouth.
- Angle the needle across from the opposite side of the mouth and insert needle toward the opening of the foramen.
- Inject anesthetic after aspiration.

Percutaneous approach

- Palpate the mandibular notch and insert the needle dorsally through the skin to contact the ventral border of the ramus.
- Walk the needle off the medial edge of the ramus and advance a third to half of the way up the height of the mandible to the opening of the foramen.
- Inject anesthetic after aspiration.



BLOCKS OF THE FORELIMB

BRACHIAL PLEXUS BLOCK

Areas Desensitized

Desensitizes the elbow joint and the entire limb distal to the elbow

Anatomy

- Spinal nerves from spinal cord segments C6, C7, C8 and T1 emerge from the intervertebral foramina and lace together to form the brachial plexus in the axillary region.
- With the traditional approach, the musculocutaneous, axillary, radial, ulnar and median nerves are blocked before or as they emerge from the plexus at the level of the shoulder. This results in desensitization from the elbow distally.

How to Perform the Block

- Clip and prep site around point of shoulder in routine surgical manner
- Insert a 22 or 20 Ga spinal needle medial to the scapulohumeral joint and parallel to the vertebral column (pointing toward the costochondral junction). Tilting the needle slightly lateral (away from the chest) will help prevent accidental puncture of the thoracic cavity.
- Advance the needle to a depth approximately at the first rib or caudal aspect of the humerus. The length of the needle used will depend on the size of the patient.
- Inject as the needle is withdrawn, intermittently aspirating to ensure the needle is not within a blood vessel.
- Volume to inject: The axillary space is large and it can be difficult to fully desensitize the forelimb. Administering a larger volume will increase the success of the block. If greater volumes are needed for small patients, the local anesthetic solution can be diluted with saline in a 1:1 ratio.
    - Bupivacaine 1-2 mg/kg
    - Lidocaine 4 mg/kg

Complications

- Intravascular injections and hemorrhage: There are large blood vessels in the area of the block including the axillary artery and vein. Always aspirate before injection and intermittently as the injection is continued while withdrawing the needle. If blood is aspirated, discontinue the block and apply firm pressure at the site for 5-10 minutes.
- Thoracic puncture: Accidental puncture through the thoracic cage can cause pneumothorax and lung laceration
- Cervicothoracic/Stellate ganglion blockade: The sympathetic trunk courses through the cervical region and can be accidentally blocked resulting in Horner's syndrome.
- Diaphragmatic paralysis: The phrenic nerve, which innervates the diaphragm, originates from spinal cord segments C5, C6 and C7 in dogs, and can be blocked inadvertently, although unlikely with the traditional brachial plexus approach described above. It has been demonstrated that hemidiaphragmatic blockade does not impair ventilation in healthy conscious or anesthetized dogs, but the impact may be significant in animals with respiratory compromise.

RADIAL, ULNAR, MEDIAN + MUSCULOCUTANEOUS NERVE BLOCKS (RUMM BLOCK)

Areas Desensitized

Blocking the radial, ulnar, median and musculocutaneous nerves will desensitize the distal forelimb, including the carpus and digits.

Anatomy

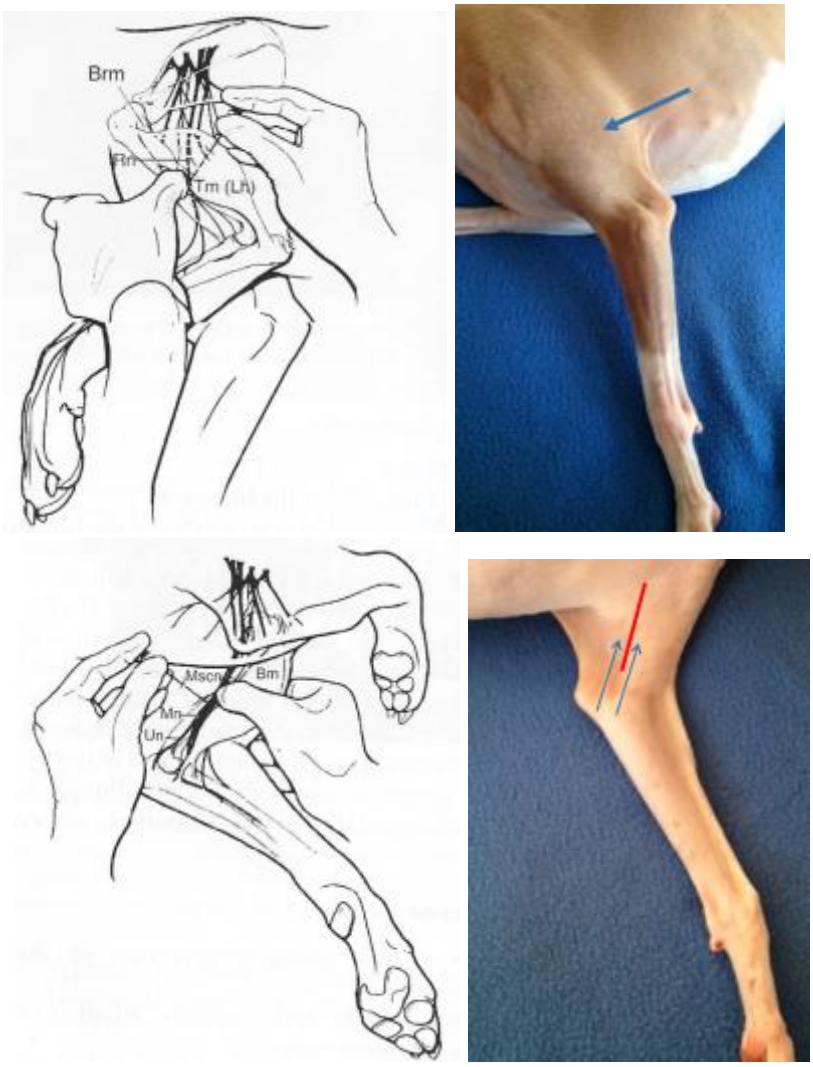
- The *radial nerve* runs between the long head of the triceps and the brachialis muscles on the caudolateral aspect of the humerus, approximately half way along the bone. It innervates the forelimb extensors and the dorsomedial aspect of the distal limb.
- The *median and ulnar nerves* run caudal to the brachial artery on the medial aspect of the distal humerus, while the *musculocutaneous nerve* runs in a similar location, but immediately cranial to the brachial artery. These nerves innervate the flexors and the remaining aspects of the distal limb not innervated by the radial nerve.

How to Perform the Block

- Clip and surgically prep the medial and lateral aspects over the injection sites on the humerus described below
- Radial nerve:
    - Position the animal in lateral with the limb to be blocked uppermost.
    - The landmark for the injection is at the junction of the middle and distal thirds of the humerus. Pull the brachialis muscle cranial to rest your thumb on the humeral shaft between the brachialis and triceps. The radial nerve can be felt crossing the humerus at this location.

- Insert a 22 Ga needle from a caudal direction perpendicular to the length of the humerus at the level of the nerve. Advance the needle until it contacts the bone near the nerve, withdraw slightly, aspirate and inject local anesthetic after a negative aspiration.

- Ulnar, median and musculocutaneous nerves:
  - Position the animal in lateral with the limb to be blocked down/dependent.
  - The ulnar, median and musculocutaneous nerves run along the medial aspect of the humerus.
  - Identify the pulse of the brachial artery between the biceps brachialis and the medial head of the triceps a third of the way up the length of the humerus from the elbow.
  - Block the ulnar and median nerves by injecting local anesthetic caudal to the artery after a negative aspiration. Block the musculocutaneous nerve by injecting local anesthetic cranial to the brachial artery after a negative aspiration. Alternatively, a single injection can be given caudal to the artery, allowing spread of the local to desensitize all 3 nerves.



Drawn images from Trumpetori BJ, et al. *Vet Surg* 2010;39:785-796

EPIDURALS

Areas Desensitized

Epidural administration of local anesthetic blocks neural signals from the spinal nerves and peripheral spinal cord at the level where the drug makes contact with these structures. Thus, the extent of the block is dependent on the volume of local anesthetic administered and how far it spreads within the spinal canal.

Volume

- Volume guidelines are based on lean body weight
    - 0.15 mL/kg:Sufficient for procedures involving the hind limbs and perineum
    - 0.2 mL/kg: Anesthesia up to L1-L3, Desensitizes the caudal abdomen
    - > 0.3 mL/kg
        - Excessive volumes of local anesthetic may spread into the upper thoracic regions and block sympathetic outflow as well as motor innervation to the respiratory muscles. This can cause hypotension and hypoventilation.
        - There is no defined volume that will cause these problems, and volumes greater than 0.2 mL/kg have been given without complications in some cases; however 0.2 mL/kg is considered safe.
        - Volumes of 0.3 mL/kg can be safely administered if an opioid is administered without a local anesthetic as sympathetic blockade will not occur
- Adjustments for pregnant animals:
    - The epidural space in pregnant animals is smaller than usual. It is thought that this is due to compression of abdominal vessels engorging vasculature within the spinal canal, accumulation of epidural fat, and hormonal changes increasing sensitivity to local anesthetics.
    - This means that a given volume of anesthetic will spread further cranially in the pregnant patient and volumes can be reduced by approximately 30%.

Anatomy

- Spinal cord and spinal nerves
    - The spinal cord rests in the spinal canal and gives off spinal nerve roots, which emerge from the intervertebral foramen. The body of the spinal cord terminates in the lower lumbar area giving off a series of spinal nerves called the '*cauda equina*'.
    - The spinal cord terminates cranial to L7 in large dogs, toward the caudal aspect of L7 in small dogs and variably around the lumbosacral junction in cats, puppies and kittens. This means that piercing the meninges and obtaining cerebral spinal fluid (CSF) is more likely when performing lumbosacral epidurals in cats, small dogs and younger animals.
- Meninges
    - There are 3 membranes that surround the spinal cord: the pia, arachnoid and dura mater.

    - The pia mater is in close apposition to the spinal cord and is joined to middle layer, the arachnoid, by fine filaments. The CSF flows between the arachnoid and pia mater. If the needle is in this space, CSF may flow back out of the needle. Injecting at this site is a “spinal” or “intrathecal” injection.
    - The outermost layer is the dura. Epidural injections are administered outside (“epi”) the dura.
- Lumbosacral (LS) space
    - The LS space is the largest and most practical site for epidurals in small animals.
    - It is possible to perform epidurals in the space between the lumbar vertebrae, but it is smaller and there is a greater chance of penetrating the meninges, and a given volume of local anesthetic will spread further cranially as it is given at a more cranial site.
    - The LS space can be palpated on midline just caudal to an imaginary line connecting the iliac wings.
- Spinous ligaments
    - There are 2 ligaments that must be punctured to access the epidural space in cats and dogs: The interspinous and intervertebral (aka interarcuate) ligaments.
    - The intervertebral ligament is made of dense connective tissue and can be felt as a ‘pop’ when pierced by the epidural needle. The epidural space is immediately past this ligament.

How to Perform an Epidural Injection

- Patients can be positioned in sternal or lateral recumbency. Some people find it easier to stay on midline and administer epidural injections with the patient in sternal recumbency. The LS space can be identified more readily with the legs pulled cranially, although this may not be possible in animals with certain injuries.
- Clip and prep the skin over the LS space in a routine surgical manner. This technique is performed sterilely. Gloves, needles, syringes and drugs are all sterile.
- Wearing sterile gloves palpate the LS space and direct the needle (without the syringe attached) into the depression at a 90° angle/perpendicular to the spine.
- After penetrating the skin, advance the needle slowly a short distance. Remove the stylet and set it on the ‘sterile tray’ of the wrapping to the sterile gloves. Place a few drops of sterile saline into the hub of the needle to form a meniscus. Advance the needle slowly until the intervertebral ligament is pierced – this can sometimes described as a “pop”, but really just feels like a change in resistance. The negative pressure of the epidural space should draw or “suck” the saline from the hub into the epidural space. Re-angle the needle as necessary to access the space.
- Test the placement of the needle:
    - Hanging drop – With the patient in sternal recumbency, place a drop of sterile saline or local anesthetic into the hub of the needle. Negative pressure of the epidural space will draw it into the needle.
    - Resistance – Using a glass air syringe or the regular syringe containing the anesthetic, inject slowly feeling for resistance. If the needle is in the epidural space the injection should be smooth with minimal resistance.

    - Bubble test – Draw a small amount of air into the syringe with the anesthetic or saline to create an air bubble. If the needle is correctly placed in the epidural space, the bubble will remain the same size during injection. If there is increased resistance on injection from incorrect needle placement, the bubble will be compressed.
- Be careful about the volume of saline used to test placement in the epidural space – this volume contributes to the total volume and cranial spread of the local anesthetic effect.
- Administer the anesthetic slowly (over ~30 seconds) to prevent compression of the spinal cord, prevent excessive cranial spread, and to prevent a "patchy" block

Epidural Opioids

- Why use opioids epidurally?
    - Opioids can be given epidurally instead of, or in addition to, local anesthetics.
    - Opioids alone do not cause desensitization or motor deficits, but will provide analgesia by binding to opiate receptors in the spinal cord.
    - The benefit of using less lipid soluble opioids (such as morphine) epidurally versus systemically is that lower doses are required compared to systemic doses, sparing many of the undesired systemic effects of opioids. The duration of analgesia is also more prolonged with epidural administration.
- Which opioid to choose?
    - The lipid solubility of the opioid has significant effects on its epidural use.
    - Lipophilic opioids, such as fentanyl, rapidly cross the meninges to exert their effect on the spinal cord. However, they are also rapidly absorbed into the systemic circulation and epidural fat. This systemic absorption limits cranial spread of the spinal analgesia, and causes the opioid to exert much of its effect supraspinally, as if it were given systemically.

    - Hydrophilic opioids, such as morphine, take longer to cross the meninges but remain in the CSF longer resulting in longer lasting analgesia and more cranial spread within the canal. Systemic absorption is much slower and analgesia is primarily from spinal versus supraspinal effects. For this reason, morphine is the opioid most commonly used in epidural injections.
    - The lipophilicity of hydromorphone is between that of morphine and fentanyl and can be used epidurally as well.
    - Epidural opioid doses: Morphine: 0.1 mg/kg, Hydromorphone: 0.02 mg/kg
- Do the same volume guidelines apply to opioids as local anesthetics?
    - Because opioids alter nociception without interfering with other sensory, motor or sympathetic impulses, volumes are less significant.
    - Epidural opioids are often administered in 0.2-0.3 mL/kg total volume with saline

Contraindications

- Coagulopathy
- Uncorrected hypovolemia or hypotension, or cardiac disease where hypotension cannot be accommodated
- Infection or neoplasia at the injection site
- Sepsis or Bacteremia
- Anatomical disruption to landmarks

Complications

- High block: Excessive cranial spread of local anesthetic can be caused by administering excessive volumes of local anesthetic. Hypotension can result from SNS blockade with subsequent venous and arterial dilation. This can be treated with vasopressors, administration of fluids and reducing the concentration of inhalant anesthetic delivered. Hypoventilation can result from blockade of thoracic motor neurons causing weakness in respiratory muscles. This can be addressed with manual ventilation.
- Epidural hematoma: Epidural venous puncture can cause hemorrhage into the canal. The extent of the hemorrhage may be significant in patients with coagulopathies resulting in a large hematoma that may compress the spinal cord or cauda equina. This compression can cause pain, weakness or bowel/bladder dysfunction depending on the site of the hematoma. Coagulopathies are a contraindication for epidural injection.
- Meningitis: Bacteria/infection at injection site can be carried into the meninges
- Inadvertent spinal injection: If the injection is administered into the subarachnoid space, it is called a spinal injection. This technique is sometimes chosen intentionally as drugs administered spinally are injected directly into the CSF and diffuse into the nervous tissue rapidly allowing lower doses and volumes of drugs. If the epidural dose is accidentally administered spinally, the patient will be overdosed. Accidental puncture of this space can often be detected by the flow of CSF out of the spinal needle. The needle should always be inserted and assessed for backflow of CSF before attaching the syringe for this reason. If this subarachnoid space is accessed, the volume of local anesthetic should be reduced by 50%. Dural puncture and subsequent leakage of CSF out of the space changes CSF pressure and can cause prolonged headaches in humans.

BLOCKS OF THE HIND LIMB

Introduction

Epidurals and fairly reliable and easy to perform, resulting in little use of hind limb nerve blocks. However, specific conditions can prevent the administration of epidurals, making knowledge of these specific nerve blocks useful. These blocks reduce the risks associated with epidural injections and enable single limb anesthesia, helping to preserve motor function and ambulation. Because multiple nerves innervate the limb, several blocks must typically be combined to produce complete anesthesia of the area. Combining the sciatic and femoral nerve blocks will provide anesthesia to the entire limb. While these blocks work best in combination, each block will be discussed individually for clarity. The efficacy of these blocks can be improved with the aid of an ultrasound or peripheral nerve stimulator.

FEMORAL NERVE BLOCK

Areas Desensitized

Blockade of the femoral nerve provides anesthesia to the femur, stifle (medial joint capsule and intra-articular structures), and skin of the dorsomedial tarsus and first digit.

Anatomy

- The femoral nerve originates from spinal cord segments L4-L6, runs through the psoas major muscle and emerges through the femoral canal
- It runs between the *sartorius and pectineus muscles* before entering the *quadriceps femoris muscle.*
- The *saphenous nerve* branches from the femoral nerve just after the site where it is blocked and is thus desensitized as well.

How to Perform the Block

- Place the dog with the leg to be blocked uppermost. Abduct the limb to 90° and extend it caudally. Clip and prep the inguinal region on this side.
- Palpate the femoral artery proximally on the limb, and identify the caudal border of the sartorius muscle located just cranial to the artery. This site of injection is between these two structures.
- Advance the needle on a 20-30° angle proximally toward the iliopsoas muscle. The femoral nerve is located immediately medial to the medial muscle belly of the sartorius and is typically no more than 1 cm deep in medium-large sized dogs.
- While advancing the needle look for a twitch; often the sartorius will twitch first from direct stimulation before a twitch from the quadriceps muscle identifying the femoral nerve.

Complications

- Hemorrhage: Because of the proximity of the femoral nerve to the artery and vein, puncture and hemorrhage is the most likely complication. If a vessel is inadvertently punctured, remove the needle and apply firm digital pressure.
- Intravascular injection: Always carefully aspirate before administering local anesthetic due to the proximity of large vessels.

SCIATIC NERVE BLOCK

Areas Desensitized

Blockade of the sciatic nerve will desensitize areas within the stifle (caudolateral joint capsule and lateral meniscus), and the majority of the limb distal to this with the exception of the first and second digits. Because it does not provide complete desensitization to the stifle it should be combined with a femoral nerve block for procedures in this area.

Anatomy

- The *sciatic nerve* originates from spinal nerves L6, L7 and S1. It courses between the greater trochanter and ischial tuberosity and bifurcates into the common peroneal and tibial nerves between the hip and stifle with considerable inter-dog variability.
- It runs between the *biceps femoris* and *semitendinosus muscles* in close proximity to the *caudal gluteal artery and vein*, which lie caudal to it.

How to Perform the Block

- Position the dog in lateral recumbency with the leg to be blocked on the upward site.
- Clip and prep the area between the greater trochanter and ischial tuberosity.

- Imagine a straight line between the trochanter and tuberosity and insert the needle at a 90° angle to the skin at a point just caudal to the trochanter (approximately 1/3rd of the way to the tuberosity). This will help you avoid hitting the gluteal vessels which run more caudally in the same space.
- The nerve stimulator will likely result in direct stimulation of the surrounding muscles; but dorsi or plantar flexion at the hock indicates stimulation of the sciatic nerve and the site for injection.

Complications

- Hemorrhage: Puncture of the caudal gluteal artery and vein is possible
- Nerve damage: Puncture or laceration of the nerve is possible without careful advancement