



# To Block or Not to Block: A Guide to Local and Regional Anesthesia

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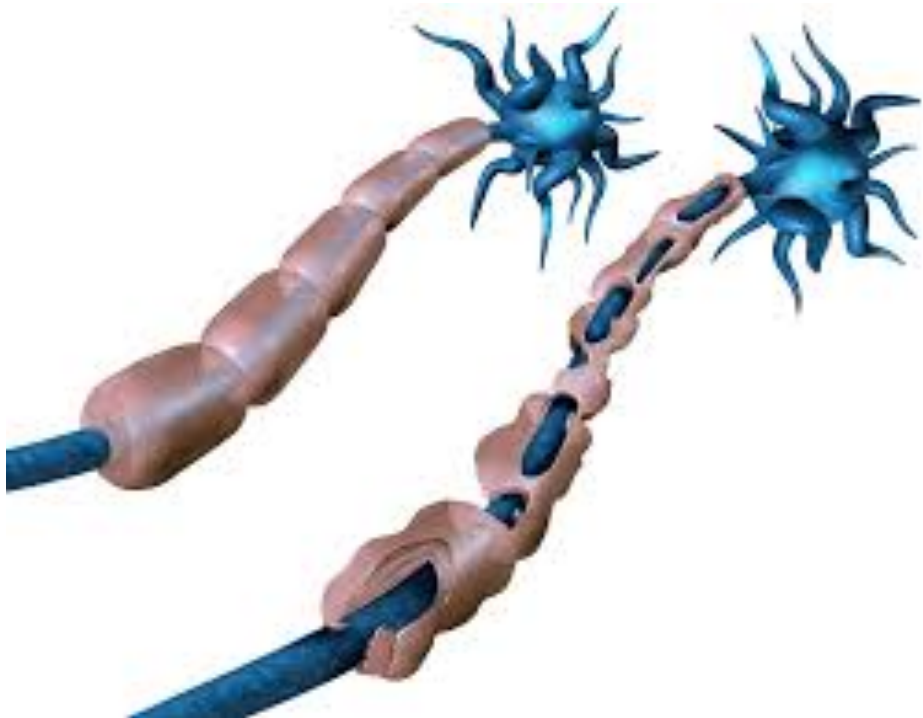
# Key Points:

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- Develop an understanding of the benefits of Local/Regional Anesthesia
- Have an understanding of the possible complications
- Basic knowledge of the tools and techniques used for nerve blocks



# Nerve Block Defined:



- Deliberate interruption of signals traveling along a nerve, often for the purpose of pain relief.



# The Pros



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Partial to full reduction  
of pain sensation

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Continued post-op pain  
control

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Anesthetic MAC  
reduction



# The Cons



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Some blocks can be difficult to master

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Efficacy of some blocks may require expensive equipment

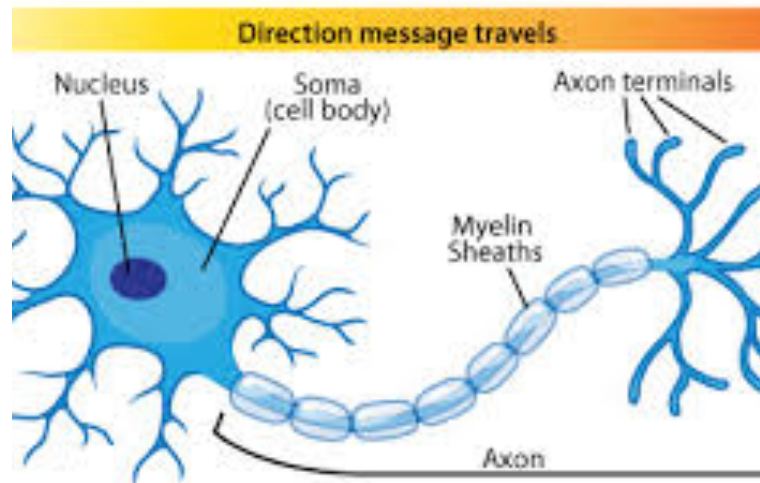
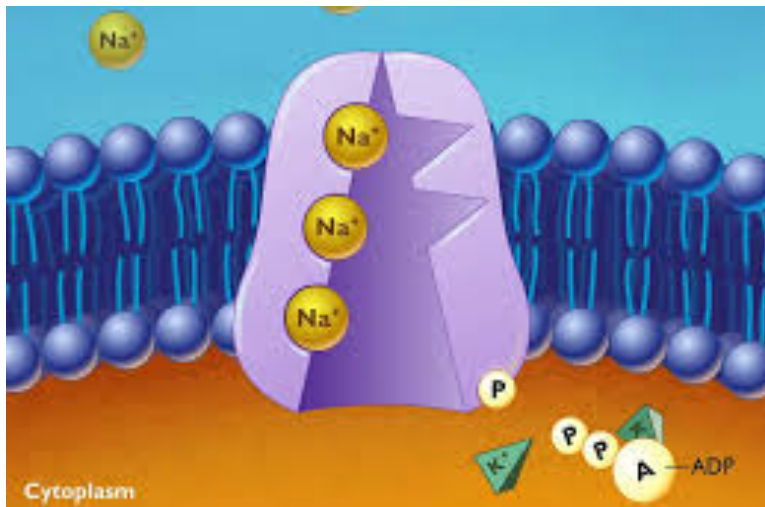
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Potential for toxicity



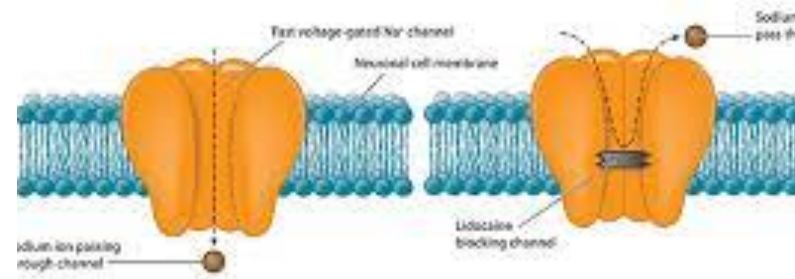
# How Does it all Work?

- Neurons rely on the Sodium Potassium pump to maintain a resting state.
- Nerve conduction of a painful stimuli starts with depolarization of the neurons.
- Sodium ions move through the pump based on a gradient



# How Does it all Work?

- Local anesthetic drug are Sodium channel blockers
- They block the channel so that Sodium ions cannot rush into the cell.
- This decreased or ceases “firing” of the neurons.



# The Drugs



- Lidocaine
- Dosage
  - Cat up to 3mg/kg
  - Dog up to 6mg/kg
- Time to onset 10-20min.
- Duration of action 40-60min.
- Highly lipid soluble
- Only local anesthetic that can be used IV.





# The Drugs



- Bupivacaine
- Dosage
  - Up to 2mg/kg in dogs and cats
- Time to onset 15-30min
- Duration of action 4-8hr
- Not useful topically
- Cannot be given IV



# The Drugs



- Ropivacaine
- Dosage
  - Dogs up to 3mg/kg
  - Cats up to 2mg/kg
- Time to onset 15-30min
- Duration of action 4-8hr
- Not useful topically
- Cannot be given IV



# Equipment

- Needles
  - Spinal Needle
  - Tuohy Needle
  - Insulated Nerve Stimulator Needles



# Equipment



- Peripheral Nerve Stimulator
  - This allows you to pinpoint the location of nerves by electrical stimulation.
  - The stimulator allows you to increase and decrease the MHz of power to make sure you are as close to the nerve as possible.



# Equipment

- Ultrasound
  - Allows for visual identification of the nerves for the gold standard of nerve blockade



# Signs of Toxicity

Nystagmus

Mental  
Impairment

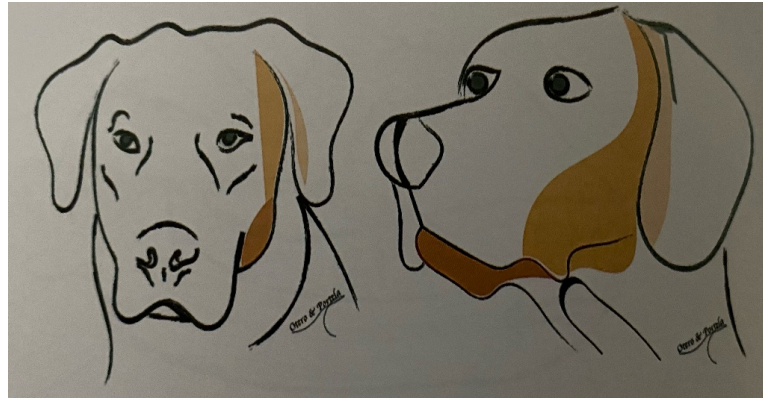
Tremors

Seizures

ECG  
Abnormalities

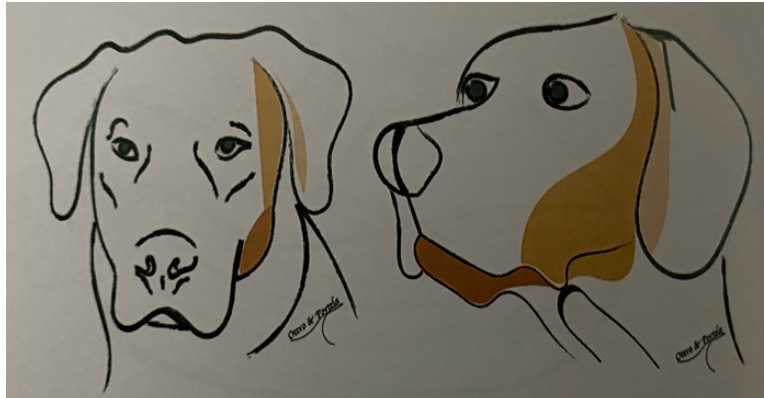


# Let's Get Down to the Blocks

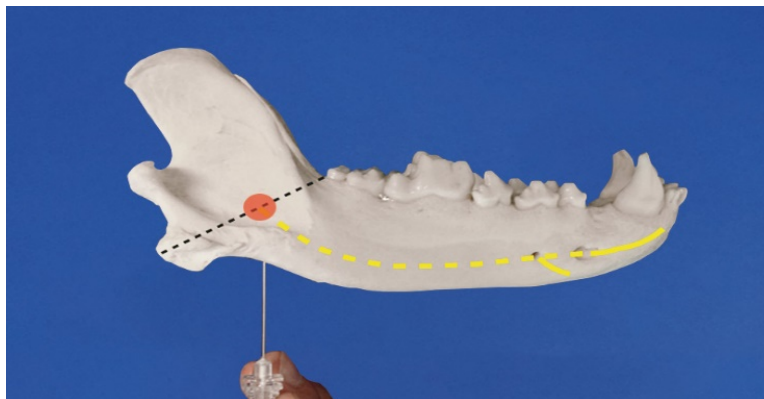


- Mental Nerve Block
- Indicated for procedures including the canine teeth and rostral structures
- Standard dosing will not apply

# Let's Get Down to the Blocks

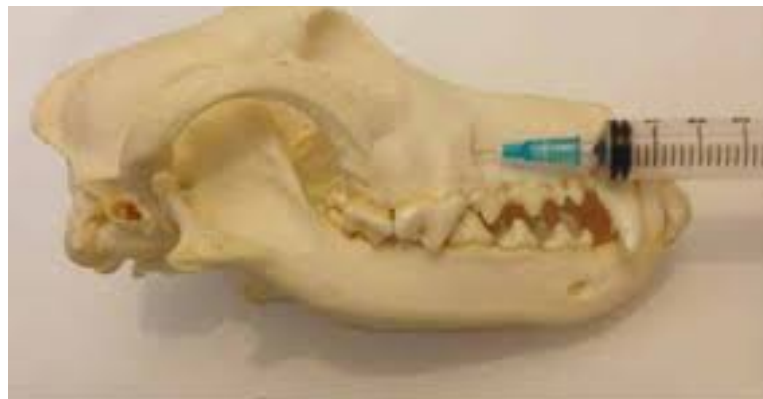
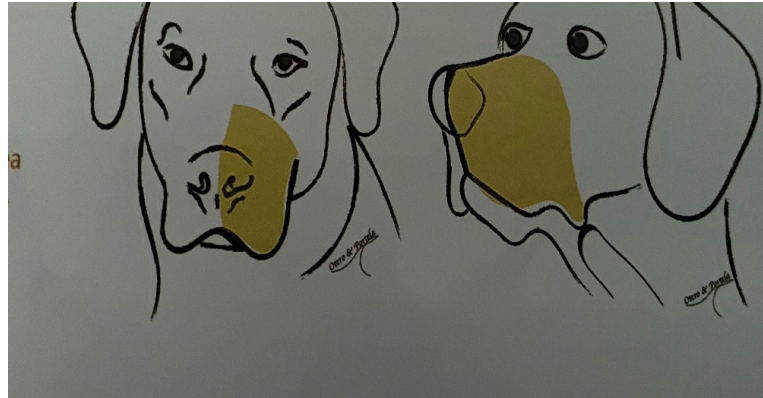


- Inferior Alveolar Nerve Block
- Indicated for procedures including the caudal maxilla and rostral structures
- Standard dosing will not apply



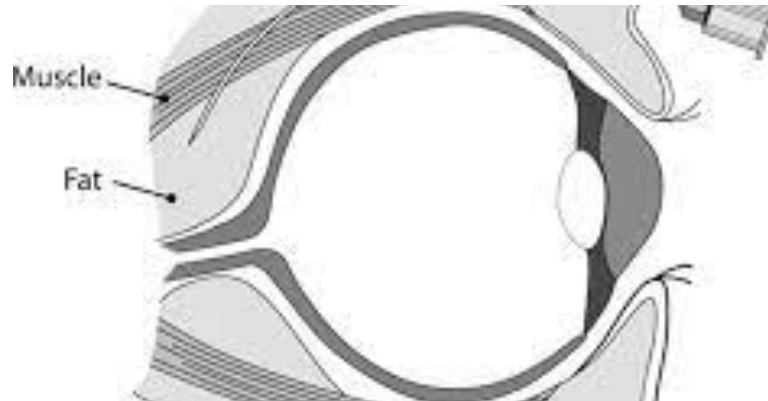


# Let's Get Down to the Blocks



- Infraorbital Nerve Block
- Indicated for procedures including the nose, upper lip, 1<sup>st</sup> and 2<sup>nd</sup> premolar, and rostral structures
- Standard dosing will not apply

# Let's Get Down to the Blocks



- Retrobulbar Block
- Indicated for Enucliation
- Standard dosing will not apply
- Recommend extensive training before solo performance



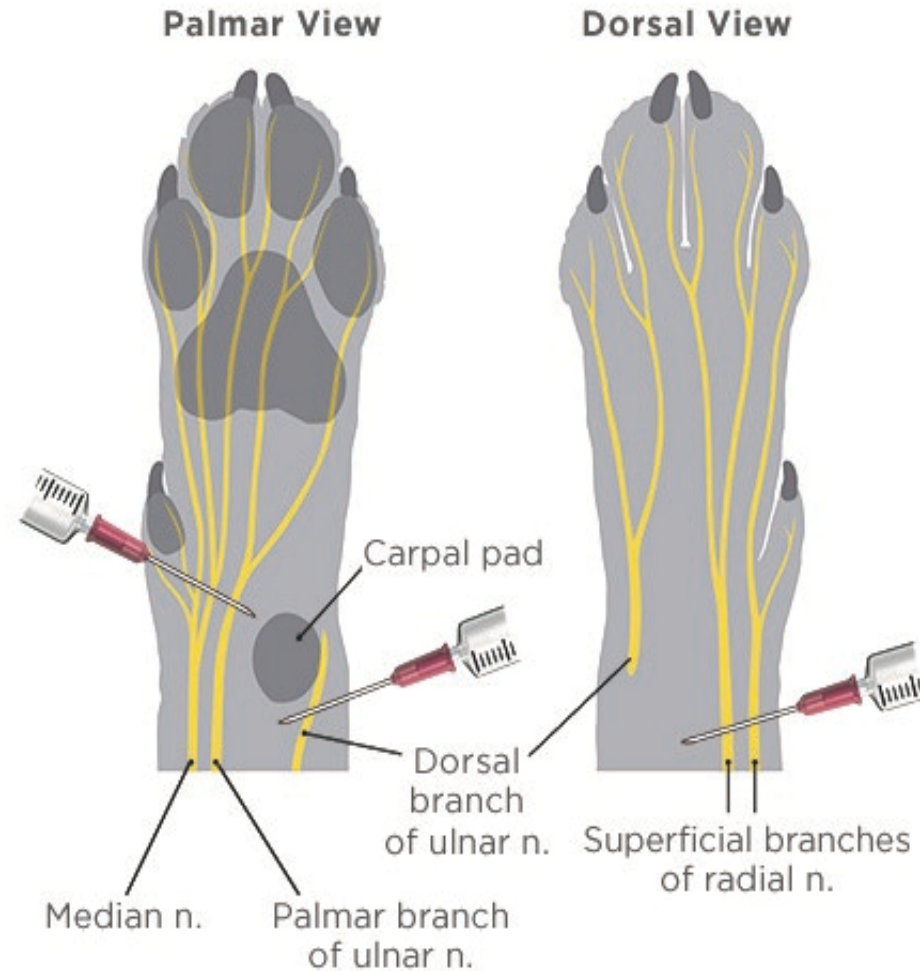
# Let's Get Down to the Blocks



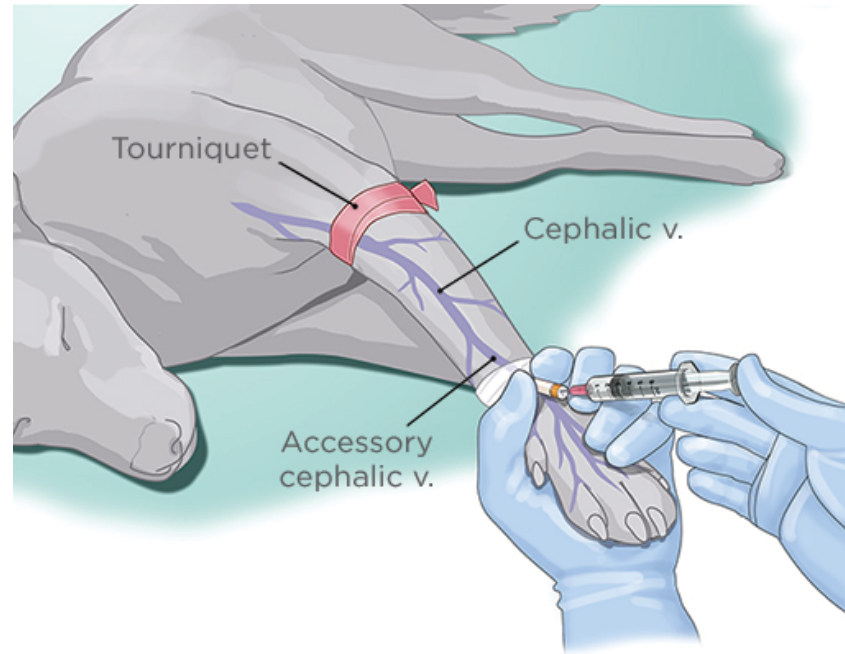
- Testicular Block
- Indicated only for Neuter
- Recommended to use Lidocaine as testicles are highly vascular
- Very simple to perform

# Let's Get Down to the Blocks

- Ring Block
- Indicated for Declaw, or minor procedures of the paw
- Multiple injection sites
- May not want to use highest doses of local anesthetics

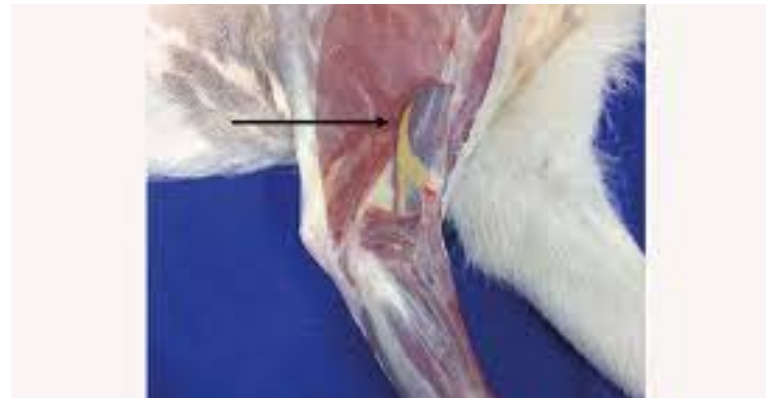
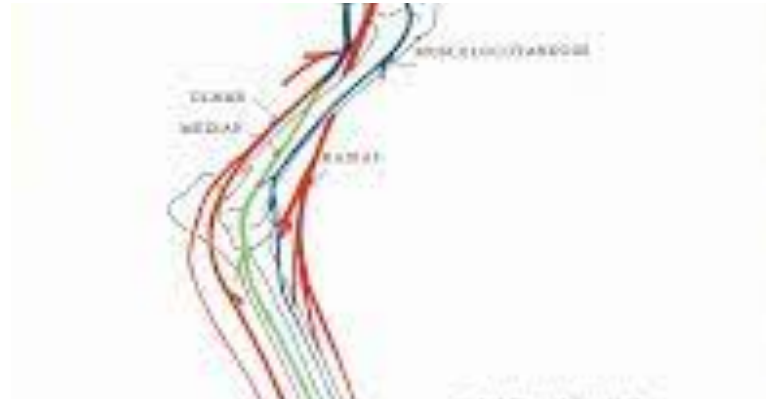


# Let's Get Down to the Blocks



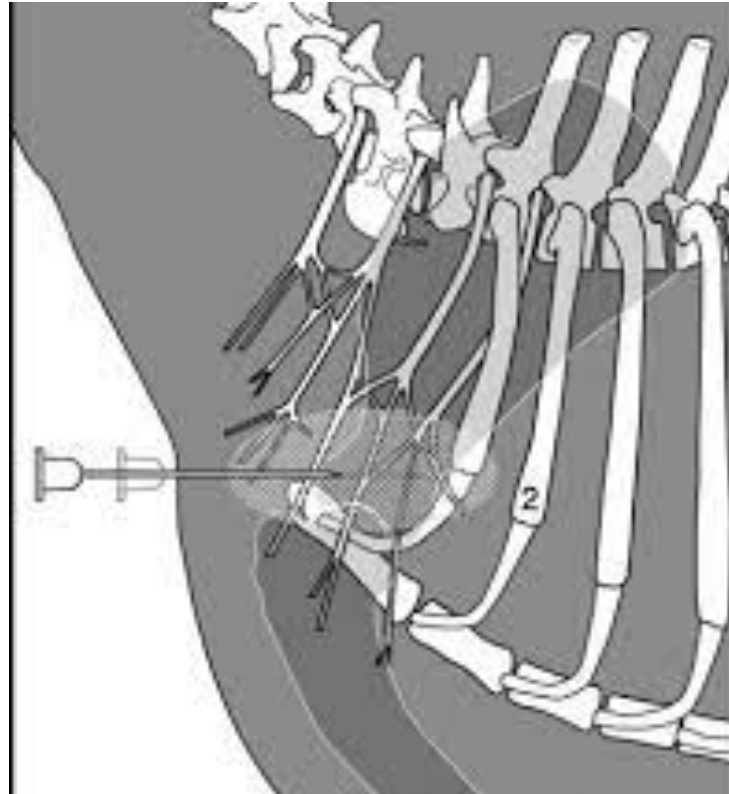
- Bier Block
- Indicated surgery on the paw such as digit amputation
- IV Block-Lidocaine ONLY!
- This block may allow for surgery to be performed under sedation

# Let's Get Down to the Blocks



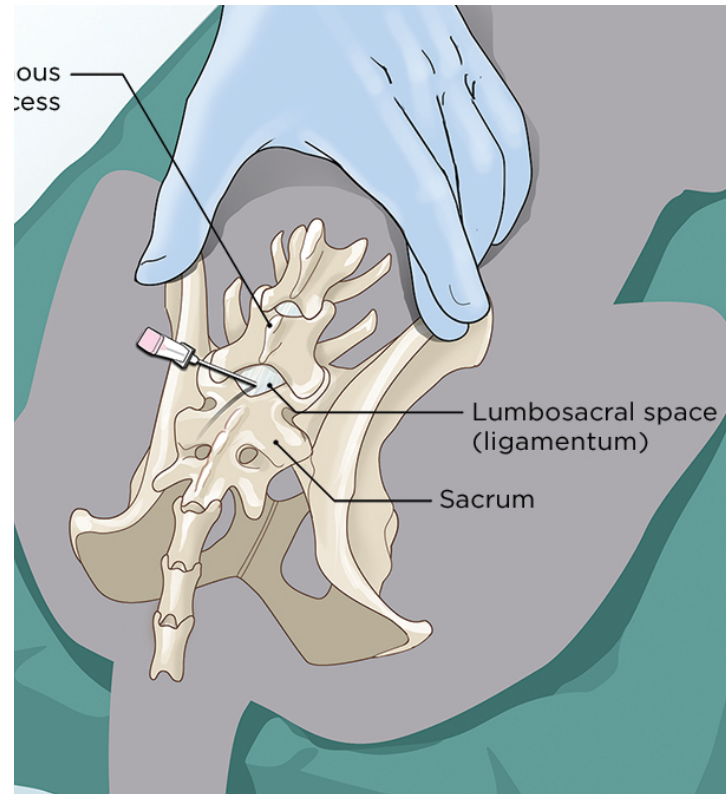
- RUMM Block
- Produces blockage of the ~3/4 of the forelimb
- Best performed with the aide of a nerve stimulator
- Multiple site injection
  - Lateral approach for Radial nerve
  - Medial approach for Ulnar, Medial, and Musculocutaneous nerves

# Let's Get Down to the Blocks



- Brachial Plexus
- Produces blockage of the mid-humerus and distal structures
- Best performed with the aide of a nerve stimulator
- Best blockade with multiple points of injection
- Requires extensive training

# Let's Get Down to the Blocks



- Epidural
- Produces blockage of primarily both pelvic limbs
- ONLY preservative free local anesthetics should be used!!!
- Requires extensive training



# Epidural Contraindications

- Pyoderma or other skin infections
- Anatomical abnormalities or fractures that disturb normal anatomy
- Coagulopathy
- Preexisting hypotension



# References

- Small Animal Regional Anesthesia – Pablo E Otero & Diego A Portela
- Clinical Anatomy and Physiology for Veterinary Technicians – Colville/Bassert
- Google Images



# Questions??

