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Local and regional anesthesia 2019 5th lecture

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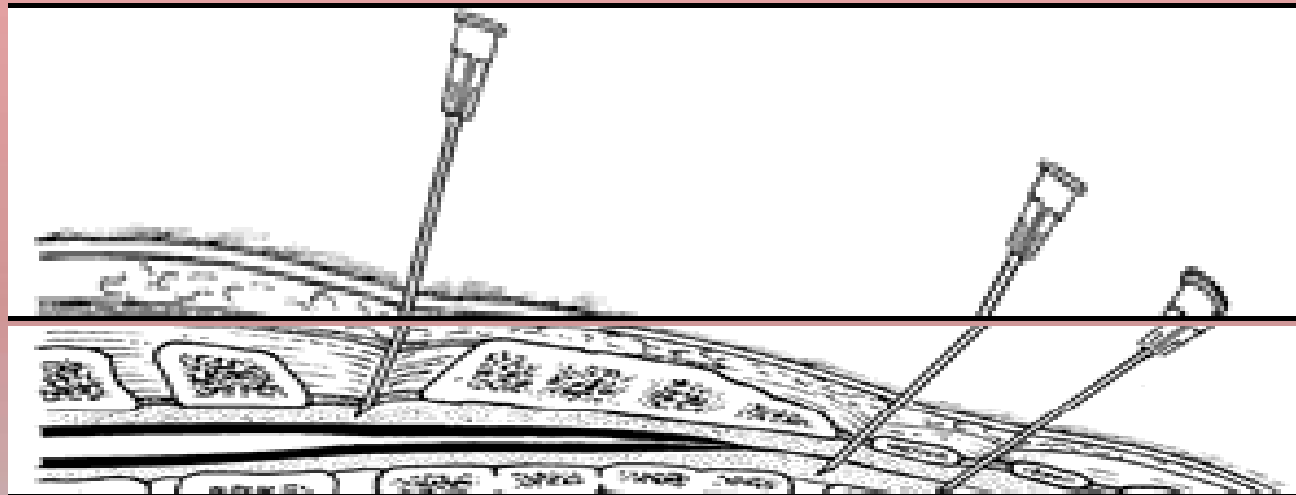
Epidural anesthesia in the sheep and goat

- ❖ In both sheep and goats, **anterior epidural anesthesia**, induced by injection at the lumbosacral junction is easily performed and provides excellent analgesia and muscle relaxation for abdominal surgery.
- ❖ Recumbency may occur but is not a problem in these small animals.
- ❖ As in cattle, there is a risk of subarachnoid injection.



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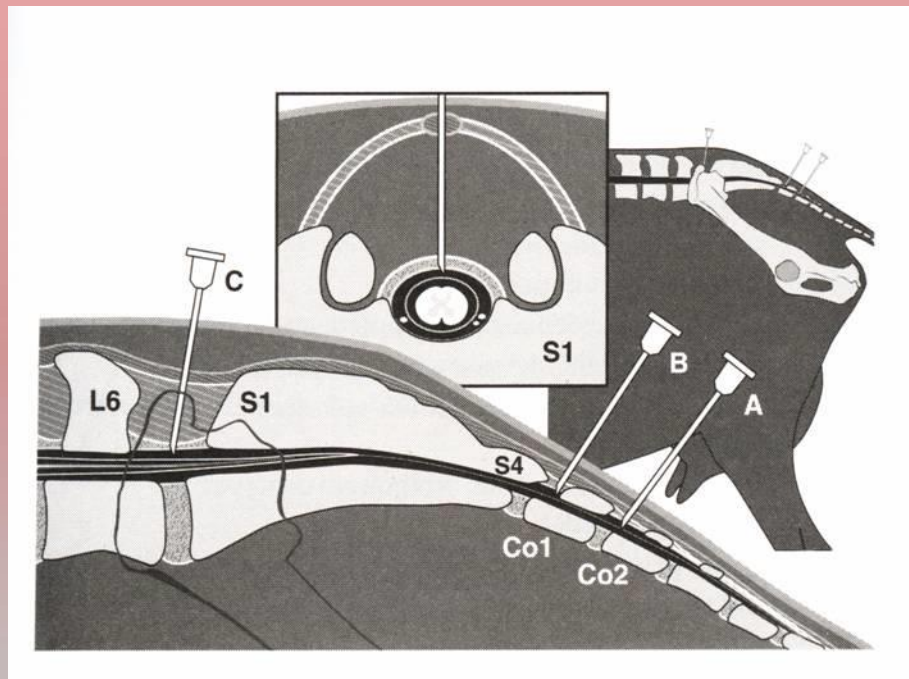


lumbosacral space, sacrococcygeal, intercoccygeal



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Epidural anesthesia in the horse

- ❖ Hind limb ataxia is a serious problem, so **only caudal epidural techniques are used.**
- ❖ These are useful for various obstetrical manipulations and surgery of the **rectum, vagina and tail.**
- ❖ The technique is less reliable than in cattle.
- ❖ Site of injection is usually sacrococcygeal junction but can be between **C1 and C2.**



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Intravenous regional local anesthesia (Bier's block)

- 1. In this technique, a limb vein is catheterized.
- 2. The limb is then exsanguinated (Esmarchs bandage), and a tourniquet placed around the limb, at a pressure adequate to prevent arterial circulation (> 150 mmHg).
- 3. Local anesthetic (preferably without epinephrine) is then injected into the vein.
- 4. After a period of 15 minutes the area distal to the tourniquet is anesthetized until the tourniquet is removed.
- 5. Intravenous regional anesthesia is commonly used in cattle for amputation of a digit.
- 6. The analgesic technique is particularly effective in the hind limb.
- 7. It is also used to a lesser extent for dogs to enable amputation of the digit combined with systemic sedation

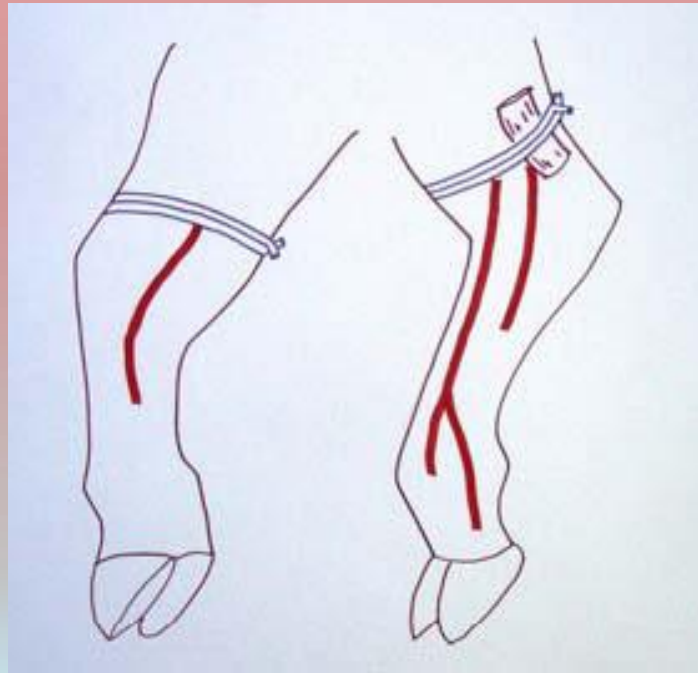


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Intravenous regional local anesthesia (Bier's block)





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Potential problems are:

1. Difficulty in finding the vein once the limb is exsanguinated (this is why it's best to have a catheter in place first).
2. Cardiac arrhythmias or even arrest. This is due to an inadequate tourniquet (in man there have been more problems when bupivacaine was used than were found with lidocaine).
3. Failure to take effect. Common reasons are inadequate tourniquet, inadequate time, and lack of exsanguinations (it does work without exsanguination but not so well).
4. Collapse when tourniquet is removed. This is because of anoxic waste products re-entering circulation. It is preferable if the animal is recumbent at this time.
5. Damage as a result of the tourniquet being left on too long. This is rare. It can be left on for 1-1.5 hours on the limb of cattle and dogs.



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► Advantage:

- Safe and simple
- Lack of toxicity to the organs if the occlusion of the blood supply is limited to 2 hours
- Blood free surgery site is ideal for taking biopsies and removing FB from paws

► Complications:

- Shock if tourniquet is left on more than 4 hours
- Sepsis, endotoxemia, death can occur if tourniquet is left on more than 8-10 hours.



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Regional anesthesia

- ❖ Examples include specific nerve blocks to the limbs; paravertebral blocks; cornual block (for dehorning) and many others.



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Paravertebral anesthesia

- Paravertebral anesthesia refers to the perineural injection of local anesthesia about the spinal nerves as they emerge from the vertebral canal through the intervertebral foramina.
- Indicated for **standing laparotomy surgery** such as **caesarean-section, rumenotomy, cecotomy, correction of gastrointestinal displacement, intestinal obstruction and volvulus.**
- The technique may theoretically be carried out in any species, and at any level of the spinal cord but in practice, its main use is to provide anesthesia of the **lumbar region in ruminants.**



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- Its advantage is that it provides analgesia and muscle relaxation of the whole area covered by the segmental nerves blocked.
- **Proximal Paraverebral NB**
- The method described whereby the needle is inserted ventral to the transverse processes of the spine has the disadvantage that the dorsal branches of the segmental nerves are not blocked, thus some skin sensitivity remains.



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- 1. The dorsal aspect of the transverse process of the last thoracic T-13 and first and second lumbar vertebrae (L-1, L-2) is the site for needle placement.
- 2. The dorsal and ventral nerve roots of the last thoracic T-13 and 1st and 2nd lumbar spinal nerve emerge from intervertebral foramina are desensitized, dorsal branch divided into medial and lateral cutaneous branches. the latter supplies much of the upper paralumber fossa while reminder of this region is innervated by the ventral branch.
- 3. 10-20 ml of 2% lidocain is injected to each site ,onset occur usually after 10 min of injection. Analgesia of the skin, **scoliosis** toward the desensitized side due to paralysis of the paravertebral muscle increase vasodilatation (paralysis of cutaneous vasomotor nerve) indicates effective block .duration of analgesia lasts approximately 90min.



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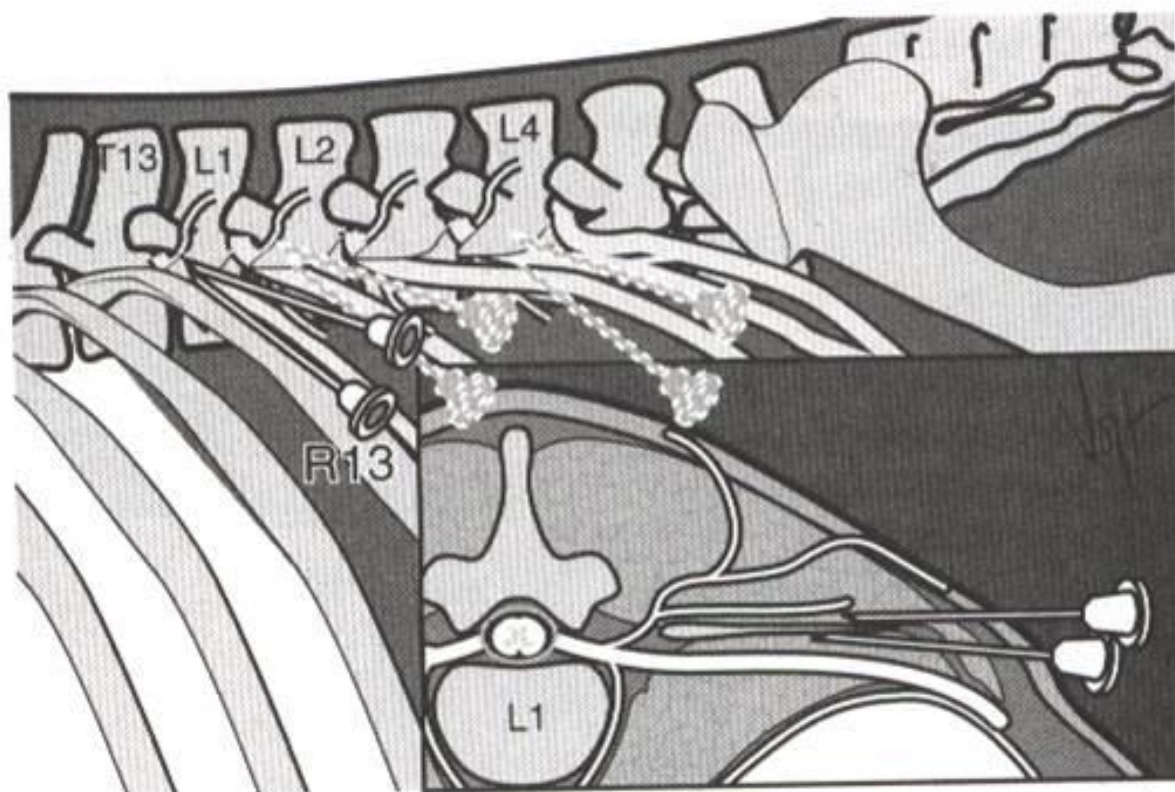


- **Distal Paravertebral anesthesia (corner technique):** Indication as above.
- 1. The dorsal and ventral rami of the spinal T13, L1 and L2 are desensitized at the distal end of L1, L2 and L4. 10 cm, 18 gauge needle is inserted ventral to the tips of respective transverse process in cow where approximately 10-20 ml of 2% lidocaine solution are injected in a fan shaped infiltration pattern.
- 2. The needle is completely withdrawn and reinserted dorsal to the transverse process, where the cutaneous branch of the dorsal rami is injected with 5 ml of analgesic.
- 3. The procedure is repeated for the second and fourth lumbar transverse process.



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Techniques	advantages	disadvantages
Proximal Paravertebral Block	Small dose require Wide and uniform area of analgesia and muscle relaxation. Increase intestinal tone and motility.	Difficult Paralysis of back muscle Risk of penetration vital structure as aorta, longitudinal vein and caudal vena cava.
Distal Paravertebral Block	Use of more routine size needles no risk of penetration a vital organ Lack of scoliosis minimal weakness in pelvic limb and ataxia	Need larg dose . Variation in efficiency exists, particularly if the nerve varies their anatomical pathway
Infiltration	Easiest and most commonly used.	1. Edema and hematoma of the multiple injections along the incision site may interfere with healing 2. Incomplete analgesia and muscle relaxation of the deeper layers of the abdominal wall 3. Toxicity after injecting significant amounts of analgesic solution 4. Increased cost due to large doses and longer time required for injection
Inverted “L” Block	1. Deposition of the analgesic away from the incision site, thus minimizing edema, hematoma, and possible interference with healing.	1. Incomplete analgesia and muscle relaxation of the deeper layers of the abdominal wall 2. Toxicity after injecting significant amounts of analgesic solution 3. Increased cost due to large doses and longer time required for injection

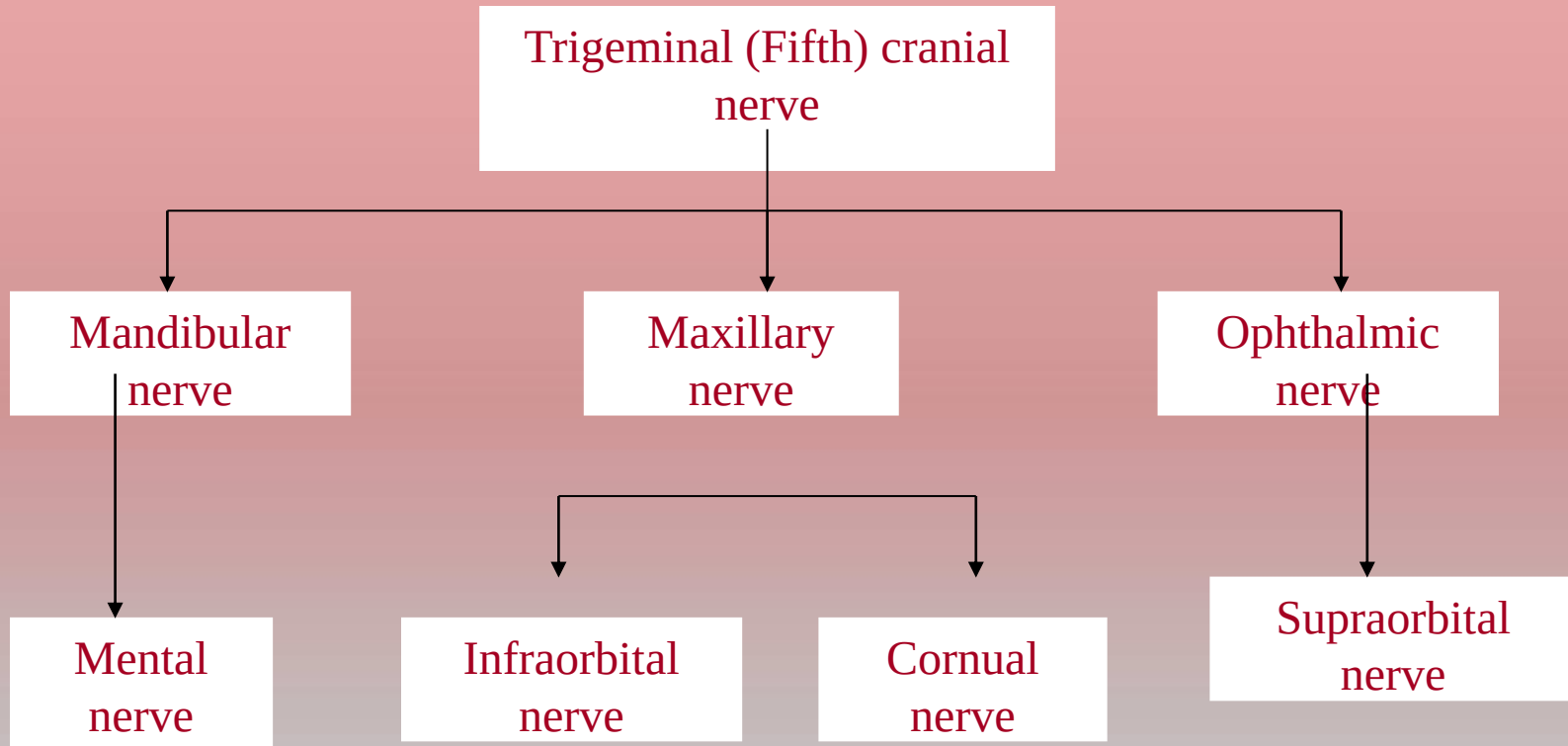


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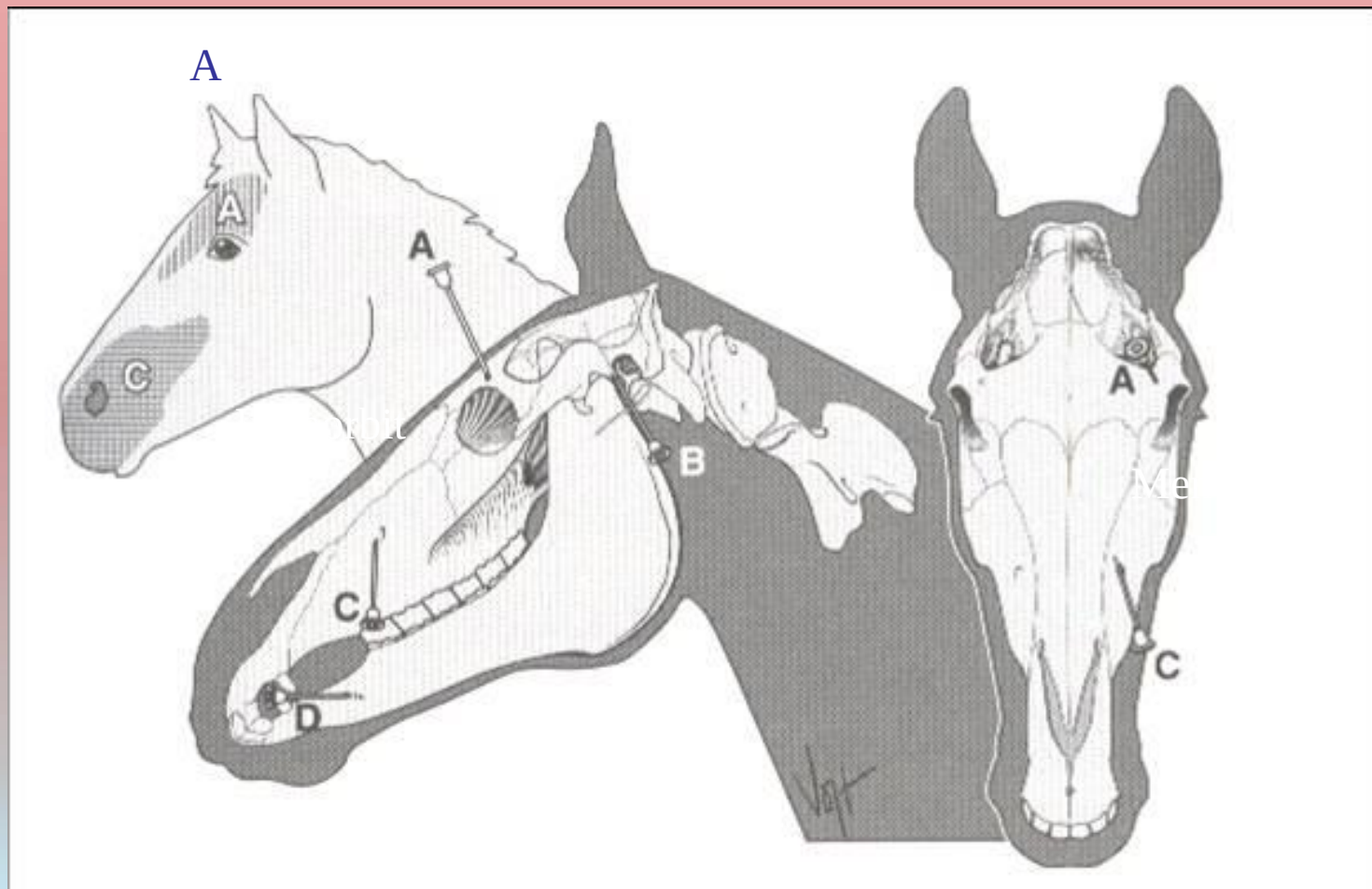
Head nerve block





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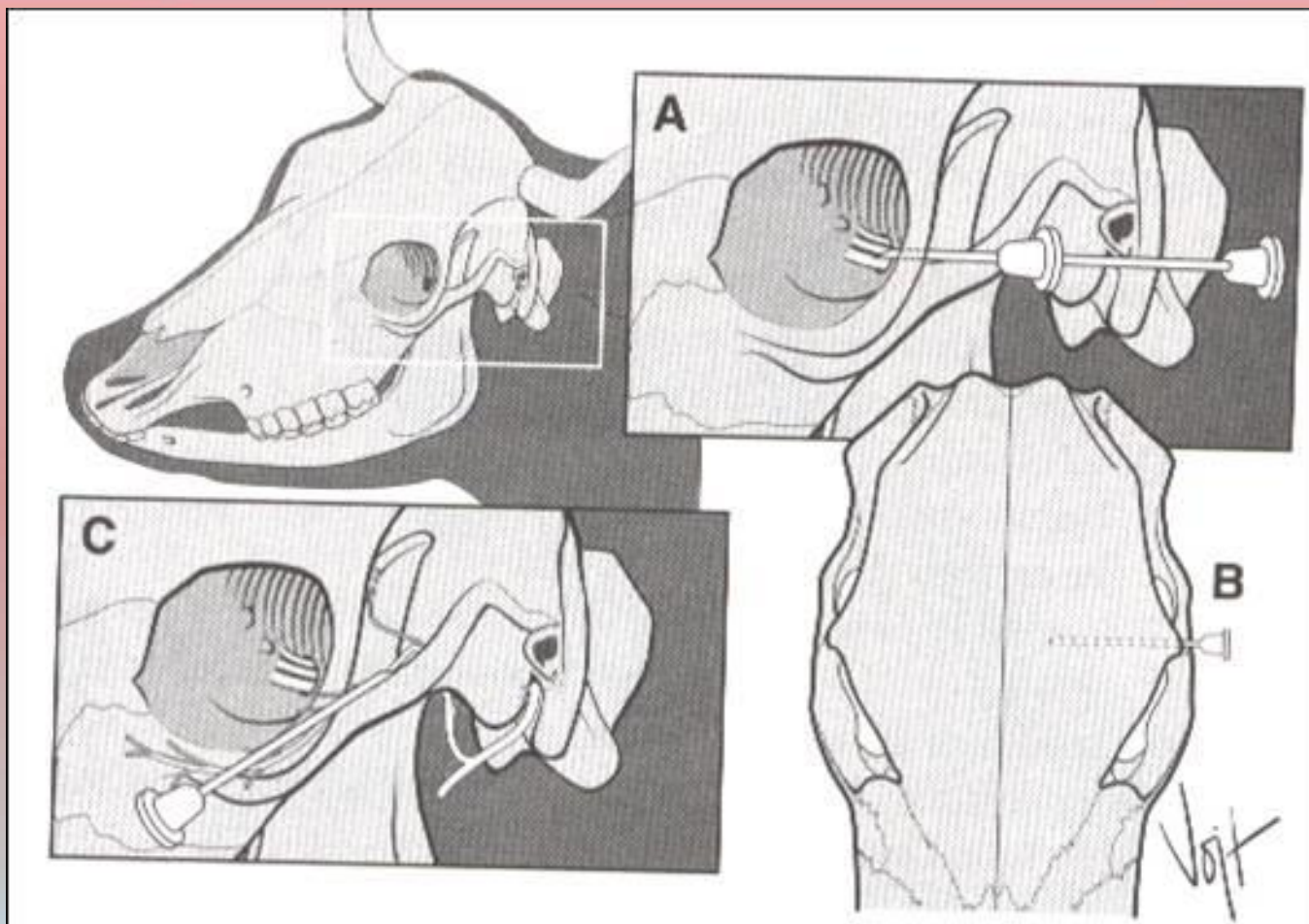
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Auricular NB

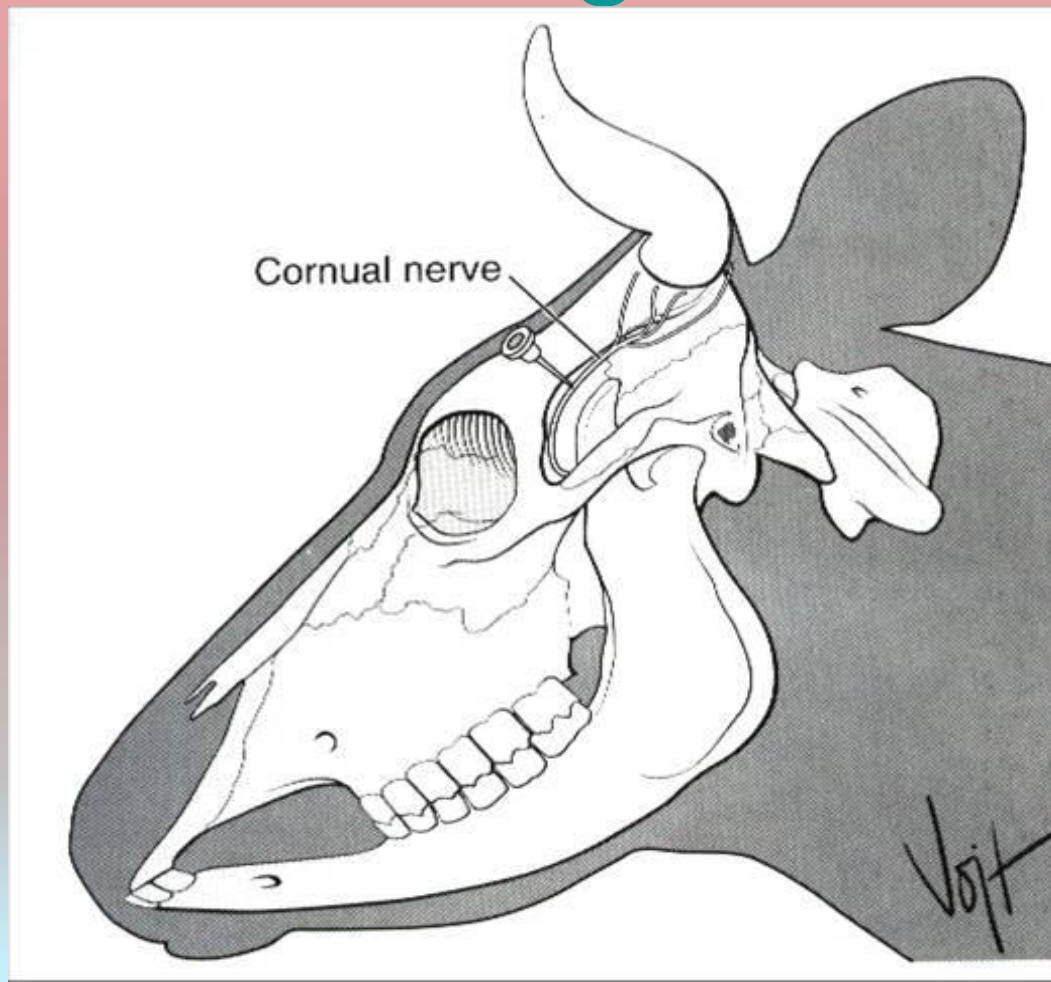


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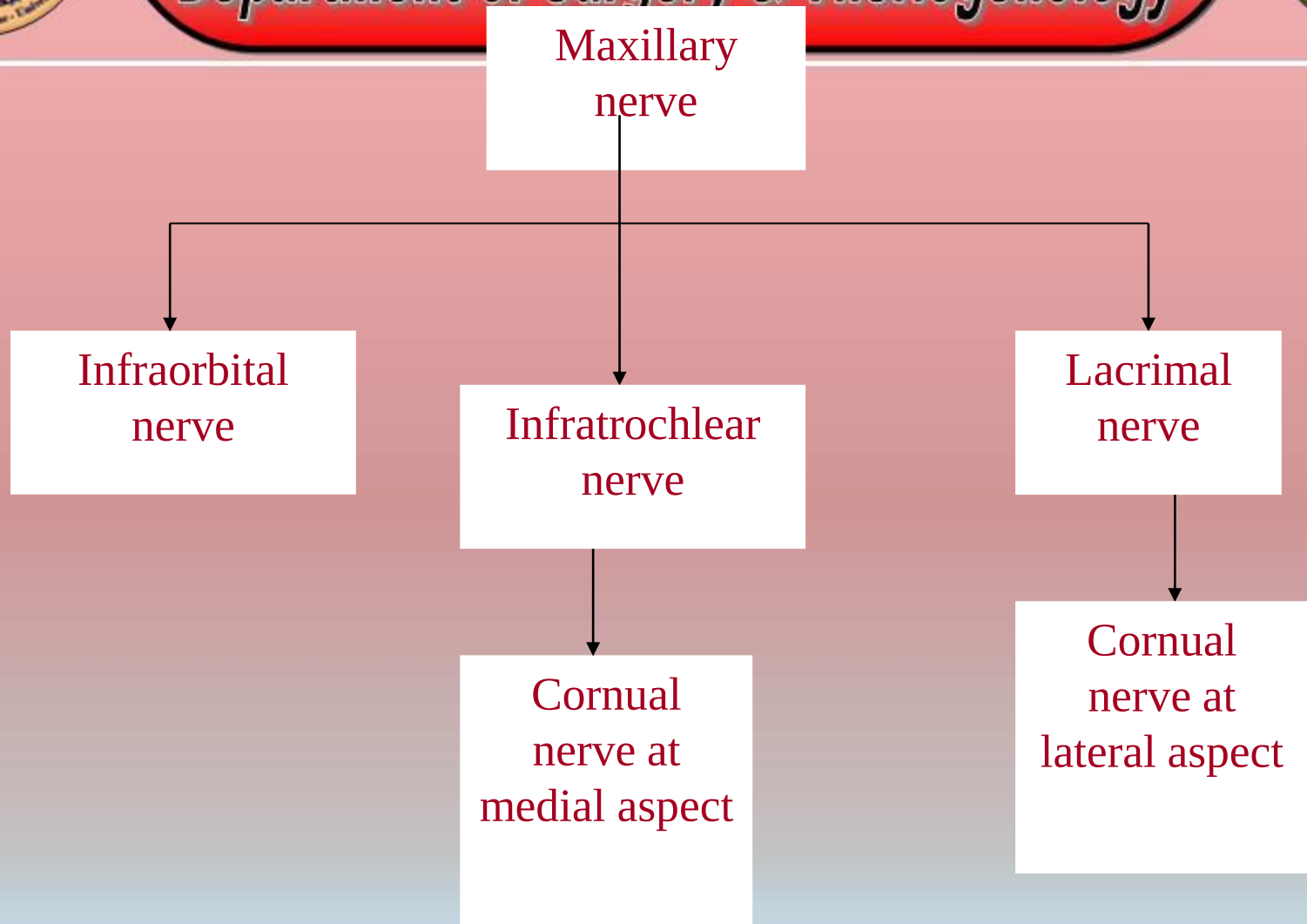
Dehorning in Cow





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In goat



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The lateral view of a goat's head demonstrates the locations for nerve block for dehorning an adult goat. The **cornual branch of the lacrimal nerve (zygomatico-temporal)** is blocked behind the root of the supraorbital process (1) and the **cornual branch of the infratrochlear** nerve is blocked at the dorsomedial margin of the orbit (2).



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Pudendal nerve block:

- Indication: for examination of and surgery of penis
- This nerve is derived from the ventral branches of spinal nerves S3,S4.it receives an anastomosing branch from sciatic nerve at the lesser sciatic foramen.
- The technique performed after appropriate skin preparation local agents injected subcutaneously beside the anus at the deepest point of the ischiorectal fossa.with the hand in the rectum a 12-25 cm 18 gauge needle is passed through the larger needle guided to the pudendal nerves.
- Palpate the pudendal nerve just caudodorsal to the internal iliac artery using digital palpation of the sacrosciatic foramen as a guide.



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Pudendal Nerve Block in Cow

