

Dental Pain Management- Drugs and Techniques

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Outlines

- Anesthetic protocols
- Preemptive analgesics
- Local anesthetics
- Take home pain medication

Selection of analgesic agents

- Opioids
- Local anesthetics
- Alpha-2 adrenergic agonists
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- NMDA-receptor antagonists, ketamine

Anesthetic protocols

- Patient classifications
- Overall healthy
- Moderately systemic dysfunction
(elevated liver or renal enzymes)
- Seriously systemic dysfunction
- Cardiac diseases, chronic renal failure

Protocol example- dogs

- Acepromazine (0.02mg/kg)- IM
- Medetomidine (5-8 mcg/kg)- IM
- Telazol (4 mg/kg)- IM
- Diazepam, midazolam 0.2-0.4 mg/kg
- Opioids- B-0.2 mg/kg, M-0.25 mg/kg, H-0.05 mg/kg, B-20 mcg/kg



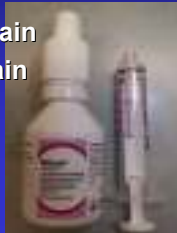
Protocol example- cats

- Acepromazine (0.1 mg/kg)- IM
- Medetomidine (8-10mcg/kg)- IM
- Telazol (4 mg/kg)- IM
- Opioids- 0.2 mg/kg, 0.25 mg/kg, 0.05 mg/kg, 20 mcg/kg
- Midazolam- Ketamine – 5 mg/kg, IM



Dental pain management

- Preemptive approach
- Multimodal approach
- Give opioids, NSAIDs, local anesthetics prior to dental pain
- Follow up with take home pain medication



NSAID precautions

- Avoid the use of NSAIDs in GI, hepatic, renal or platelet dysfunction dogs and cats
- Avoid the use of NSAIDs in animals that received or will receive steroid within 7 days
- Avoid the use NSAIDs with other NSAIDs
- Avoid repeat dosing in cats due to long elimination half life

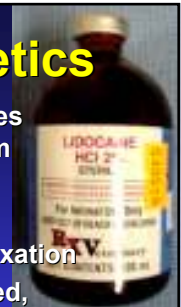
Meloxicam

- Injectable 0.2 mg/kg, SC for dogs
- Injectable 0.1- 0.2 mg/kg, SC for cats
- As part of the premedication
- Or given soon after anesthesia induction but before dental procedures
- Animals already on meloxicam should continue



Local Anesthetics

- Conduction of nerve impulses through inhibition of sodium channels
- Analgesia,
- Motor blockade, muscle relaxation
- Safe, effective, non-controlled, cheap
- Need to know **toxicity**, injection **techniques**, **duration** of action



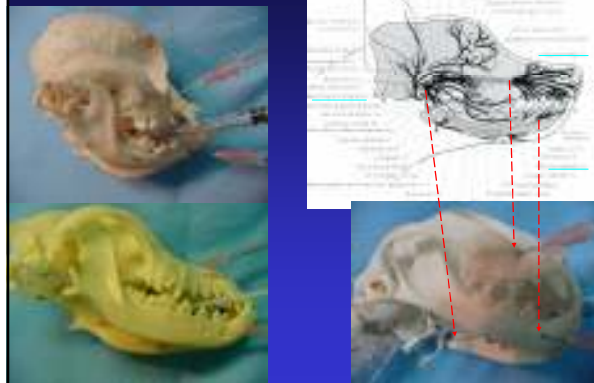
Local anesthetics

- **Procaine (ester)**
- Onset: 5-10 min; 30-60 min duration
- **Lidocaine (amide)**
- Onset: 3-5 min, 60-90 min duration
- **Mepivacaine (amide)**
- Onset: 5-10 min; 2-3 hr duration
- **Bupivacaine (amide)**
- Onset: 20-30 min; 4-6 hr duration

Bupivacaine (concentrations)

- **0.25%** - 2.5 mg/ml, **0.5%** for peripheral nerve blocks, **0.75%**
- All % inducing sensory blockage
- **0.25%** - muscle relaxation is not important or other drugs with muscle relaxation are in used, onset is slower than 0.5% & 0.75%
- **0.5%** - producing motor blockage, but muscle relaxation may be inadequate where a complete muscle relaxation is necessary- fracture reduction
- **0.75%** - complete motor blockage with muscle relaxation – epidural block for abdominal surgery; not for obstetrical anesthesia....cardiac arrest occurs with difficult resuscitation frequently associated with 0.75%

The three blocks in cats & dogs



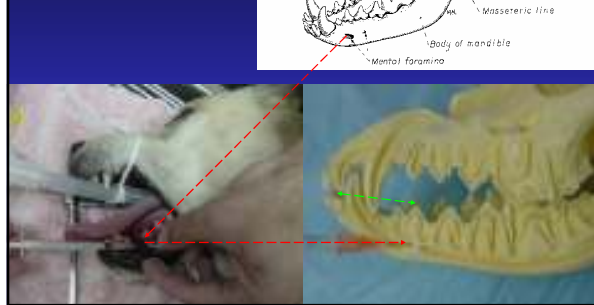
Infra-orbital Foramen (blocks PM3 to I1)

0.5 ml of 2% Lidocaine +
0.5 ml of 0.5% bupivacaine and
give 0.5 ml per site for infiltration



Mental Foramen (blocks PM2 to I1)

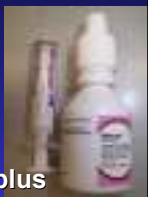
0.5 ml of 2% Lidocaine +
0.5 ml of 0.5% bupivacaine and
give 0.5 ml per site for infiltration





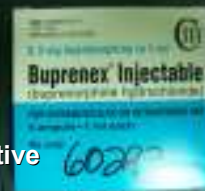
Take home pain medication

- Continue on NSAIDs
- Use buprenorphine
- Use tramadol
- Use a combination of NSAID plus buprenorphine
- Use NSAID + tramadol



Buprenorphine

- Premed, or postoperative
- 10-20 $\mu\text{g}/\text{kg}$, IM, IV
- Long lasting analgesia 6 hours
- Cat OHE-declaws
- Analgesia for soft tissue surgery
- **October 7th, 2002** Controlled status changed from V to III, same class as ketamine



Buprenorphine (cats)

- Sublingual administration
- Same doses (10-20 microgram/kg) as IM or IV
- Convenient and effective
- Bioavailability – 106 %
- Suitable for take home postoperative pain management

Saliva pH, sublingual, oral



Cat- Saliva pH ~ 9



Dog saliva pH ~ 8-9



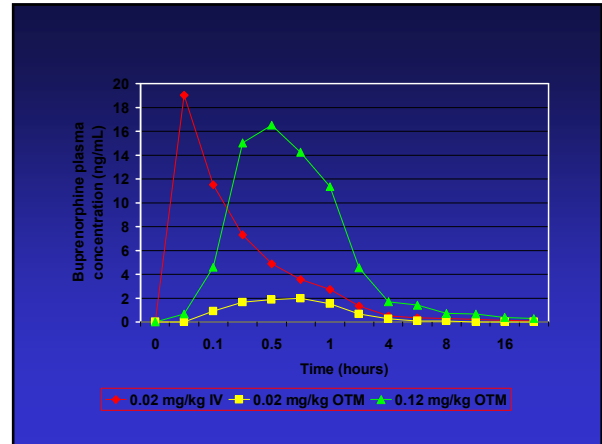
Sublingual buprenorphine



Pharm Res. 2007 Sep 1; McInnes F et. al.

Buprenorphine-dogs





Buprenorphine

- Treat mild to moderate pain
- Dogs and cats can be given OTM
- Toy breed dogs 0.02-0.12 mg/kg
- A 5 kg dog give 0.5-1 ml (0.3 mg) = **0.03-0.06 mg/kg, OTM**
- A 10 kg dog give 1 ml = 0.03 mg/kg
- A 20 kg dog give 2 ml
- Use it with a NSAID
- Package- Ampule problem



Buprenorphine




Tramadol

- A synthetic analogue of codeine
- Acts centrally to induce analgesia
- Binds to mu opiate receptors and inhibits nor-epinephrine and serotonin reuptake.
- Both parent compound and the metabolite (called M1) are pharmacologic active, with M1 being more potent than the parent compound.
- Less respiratory depressive than morphine and does not cause histamine release.

Clinical use of Tramadol

- Analgesia begins within one hour and starts to peak in two hours.
- An analgesic medication that can be sent home with NSAIDs following surgery
- 50 mg per tablet
- Not a controlled substance.
- 10 mg per kg for dogs and cats SID

Precaution of using tramadol

- Renally or hepatically impaired patients should use lower doses
- Patients taking other medications that lower seizure threshold or having high risk of seizure
- Dizziness, nausea, vertigo in humans are common side effects

