



2: ACUTE PAIN ASSESSMENT AND BUILDING AN ANALGESIC PLAN

PAIN ASSESSMENT

- Pain is the 4th vital sign, and should be assessed along with temperature, pulse and respiratory rate (TPR) during physical examination.
- Lack of pain recognition reduces the prevalence of analgesic administration, contributing to inadequate treatment.
- Pain assessment is subjective and based on the veterinarian's interpretation of pain-induced behaviours. Physiological indicators are **not** reliable in acute pain assessment.
- Pain assessment involves two parts; 1) observations of posture, general behaviour, comfort, activity, attitude, body position and facial expressions and 2) a dynamic and interactive approach involving greeting the animal and performing gentle palpation of the wound/painful area. Behavioural reaction to touch and palpation are important in clinical decisions.
- Development of new behaviours or absence of old behaviours beyond the immediate perioperative period may be indicative of pain.
- Facial expressions are important in acute pain assessment. They are incorporated into the Glasgow Composite Measure Pain Scale-Feline (Reid et al. 2017) and can be used for pain assessment in cats using the Feline Grimace Scale (www.felinegrimacescale.com) (Evangelista et al. 2019, Watanabe et al. 2020).
 - o Figure in the infographics: The Feline Grimace Scale is composed of five action units (ear position, orbital tightening, muzzle tension, whiskers change and head position), each one is scored from 0 to 2
 - o 0 = action unit is absent;
 - o 1 = moderate appearance of the action unit, or uncertainty over its presence;
 - o 2 = obvious appearance of the action unit (Evangelista et al. 2020).
- Examples of validated pain scoring systems include the short-form of the Glasgow Canine (CMPS-SF) (Reid et al. 2007) and Feline pain scales (Reid et al. 2017) (www.newmetrica.com), the UNESP-Botucatu feline short-form composite scale (animalpain.com.br/en-us) and the University of Melbourne pain scale (dogs) (Firth and Haldane 1999).
- Rescue/intervention analgesia should be provided for pain relief according to pain scoring systems. It is important that pain assessment is performed again after administration of the analgesic to ensure that treatment is effective.
- Pain assessment may be affected by disease severity, breed, sedation, observer, anaesthetic drugs, drug-induced changes in behaviour (i.e. dysphoria, emergence delirium, demeanour, etc).
- Pain should be assessed every hour in the first few hours post-operatively. Patients resting in a normal posture should not be disturbed for pain assessment. Frequency and duration of assessment will depend on patient status, type of surgery and prognosis.

BUILDING AN ANALGESIC PLAN: THE FOUR QUESTIONS IN ACUTE PAIN

- **Multimodal and preventive analgesia** are now concepts used routinely for pain management.
- Preventive analgesia refers to all types of perioperative technique and effort to decrease postoperative pain. Analgesic treatment is administered at any time and for any duration needed for pain relief in the perioperative period.
- Multimodal analgesia is the administration of two or more analgesic drugs with different mechanisms of action. These drug combinations may have a synergistic effect allowing use of lower doses for each class and consequently preventing drug-induced adverse effects.

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Therefore we suggest that four questions are asked when building an analgesic plan:

1. Is there a local anesthetic block that I can use?

(Also see guideline 3)

- Local anaesthetics are part of the first line of treatment in acute pain management and there is rarely any contra-indication to their use (with the exception of epidural anaesthesia).
- Maximum doses should be calculated to avoid toxicity. Negative aspiration of blood should be confirmed before injection to avoid haematoma and accidental intravenous injections. Lack of resistance to injection should be ensured to prevent nerve damage with a local anaesthetic block.
- Local block provides muscle relaxation and analgesia, decreases opioid requirement and produces a marked volatile anaesthetic-sparing effect.
- Simple techniques include dental, intraperitoneal and incisional blocks. Intra-testicular blocks should be used routinely in dogs and cats undergoing neutering.
- Anaesthetic recovery is usually smooth when a local anesthetic block is effective, preventing the need for large doses of opioids or sedatives in the perioperative period.

2. What is the opioid of preference?

- Opioids are the cornerstone of the first line of treatment in acute pain management. Full agonists of opioid receptors (e.g. methadone, fentanyl) provide dose-dependent analgesia and are preferred for moderate to severe pain, especially in dogs.
- Opioids increase vagal tone and may cause bradycardia which responds promptly, if required, to an anticholinergic agent (atropine, glycopyrrolate).
- Opioids may enhance anaesthetic-induced respiratory depression but this is not a problem in conscious dogs and cats.
- Sedation after opioid administration is particularly obvious in critically ill dogs and cats.
- Opioid administration decreases morbidity and mortality in dogs; probably the same occurs in cats. Opioids produce variable degrees of pain relief and generally decrease injectable and volatile anesthetic requirements. This sparing effect is more limited in cats than with dogs.
- Agonists of κ -opioid receptors and antagonists of μ -opioid receptors (e.g. butorphanol) provide limited analgesia and are more commonly used for sedation when administered in combination with agonists of α 2-adrenergic receptors or acepromazine.
- Buprenorphine is described as a partial agonist of μ -opioid receptors and is better used as part of multimodal analgesia.
- Buprenorphine is particularly effective and well tolerated in cats (compared with dogs) and may be acceptable as the first line opioid in this species.
- Studies have demonstrated that methadone provides superior analgesia compared to buprenorphine in dogs and cats undergoing ovariohysterectomy and dogs undergoing orthopaedic surgery.

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3. Are there contra-indications for nonsteroidal anti-inflammatory drug(s) (NSAID) administration?

- NSAIDs are the most widely used analgesics in companion animals due to their anti-inflammatory, analgesic, and antipyretic effects. Surgery causes tissue damage and some degree of inflammation. NSAIDs are important in providing sustained pain relief.
- NSAIDs should always be considered for perioperative pain management as long as there are no contraindications.
- The timing of NSAID administration is controversial but it is reasonable to suggest that they can be administered when:
 - 1) Blood pressure is monitored and under control;
 - 2) Fluid administration has been initiated;
 - 3) Contra-indications have been excluded (gastrointestinal disease, NSAID intolerance, uncontrolled renal disease, hepatic disease, coagulopathies, hypovolaemia and hypotension, concurrent NSAID or corticosteroid administration)
- NSAIDs exert a range of inhibition on both cyclooxygenase (COX)-isoforms and therefore can induce adverse effects (gastric irritation, protein-losing enteropathy and renal damage as well as prolonged bleeding time by preventing platelet aggregation).
- NSAID-induced adverse effects should occur only if contra-indications are not respected. Anorexia, diarrhoea, vomiting and depression are usually the first signs of toxicity; treatment should be stopped immediately if any of these occur.
- Unjustified fear of NSAID-induced adverse effects may limit pain management and cause an issue of animal welfare. Cats benefit from prolonged NSAID administration in some cases and this should be considered on a case-by-case basis.
- Readers are invited to consult the labels in their own country for appropriate dosing in dogs and cats.

4. Is there a need for adjuvant analgesics?

- Adjuvant analgesic drugs (paracetamol [**not** in cats], ketamine, tramadol, gabapentin and dexmedetomidine) are administered for severe acute pain and prevention of persistent postsurgical pain, especially if NSAIDs are contraindicated. They are also used for long-term, multi-modal pain management.

SUMMARY:

The first line of acute pain treatment involves non-pharmacological therapies, then administration of opioids, local anaesthetics and NSAIDs once contra-indications have been excluded. The second line of treatment involves addition of adjuvant analgesics and may be important for oral medication after hospital discharge.

The main goals of acute pain therapy are to maximize analgesia and comfort, minimise adverse effects and prevent a negative endocrine stress response. Treatment should also incorporate anxiolysis and muscle relaxation, when needed, to encourage a calm, quiet recovery.

Non-pharmacological therapies are used as adjuvants to complement the treatment of pain. They include bandaging (wound care), cold therapy, nursing (i.e. positioning, fluid therapy, nutrition), environment (i.e. dry, calm, quiet and comfortable) and an area for cats that is separated from dogs (cat-friendly practice).

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Table 1

Recommended dosage regimens for opioids and local anaesthetics used in the treatment of acute pain in dogs and cats (Europe).

| Drug | Dose and preferred route of administration | Comments |
|---|--|---|
| Methadone | 0.2–0.5mg/kg q 4h IM, IV or OTM (cats) | Has NMDA receptor antagonist properties. Does not produce vomiting. |
| Morphine (No veterinary licensed product) | 0.2–0.5mg/kg q 4–6h IM | Cautious use with IV administration due to histamine release (IM preferred). May cause nausea and vomiting. |
| Pethidine (No veterinary licensed product) | 3–5mg/kg q 1–2h IM | Do not administer IV due to histamine release. |
| Tramadol | 2–4mg/kg q 4-6h IM, IV, PO | Noradrenaline (norepinephrine) and serotonin re-uptake inhibitor in addition to its opioid-like effects. Genetic variation in metabolism means that some dogs do not produce opioid metabolites needed for analgesic effect when used as the sole analgesic for surgical procedures. |
| Fentanyl | Bolus 1–5 µg/kg + 5-20 µg/kg/hour infusion IV | High doses may produce dysphoria in awake patients or during anesthetic recovery. Excellent anaesthetic-sparing effect. Respiratory support almost certainly required when fentanyl is used during anaesthesia. |
| Butorphanol | 0.2–0.4mg/kg q 1–2h IM, IV | Limited analgesic efficacy only suitable for mild pain or for sedation. |
| Buprenorphine | 0.02–0.04mg/kg q 4–6h IM, IV, OTM (cats) | Euphoria is commonly observed. SC administration may not produce adequate analgesia. |
| Bupivacaine | Doses should not exceed 2 mg/kg | Never administer IV due to cardiotoxicity. Longer duration of action than lidocaine. |
| Lidocaine | Doses should not exceed 7 mg/kg | Can be administered IV at 1 mg/kg to treat ventricular dysrhythmias. IV infusion is not recommended in cats due to cardiovascular depression. |

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