Pain – Indicators and management

3

3.1 Pain – Introduction

Introduction and definition of pain

What is pain?

> Pain is an unpleasant sensation and comes in many forms, all of which cause suffering to the animal.

Molony and Kent (1997) defined pain as: 'An aversive, sensory experience which represents awareness (by the animal) of damage or threat to the integrity of its tissues'.

In other words, pain can be thought of as a sensation resulting in the activation of protective mechanisms of an animal.

Why is it important for a veterinarian to recognise pain?

Pain is a sign of disease in an animal. Pain is exhausting and may lead to secondary complications such as weakness, unwillingness to eat (Dobromylskyj et al. 2000, Almeida et al. 2008), drink or sleep and increased susceptibility to disease and accidents.

> It is the responsibility of a veterinarian to be able to recognise and alleviate any pain that the animal is experiencing.

It is also necessary to be able to assess when pain has been relieved and treatment has been successful.

How can pain be diagnosed and managed?

Although the animal cannot tell a clinician about its pain experience, physiological and behavioural changes can be observed which help you to diagnose that pain is present.

> Always consider whether pain may be present during a consultation.

Refer to Section 1.1 for a detailed explanation of the 'integrated consultation process'.

- Recognise that an equid may be in pain.
- Where is the pain coming from?
- Consider how to alleviate the pain, if present.
- Explain pain to an owner who may not see pain as a problem.
- Minimise any pain caused during the consultation process.

Figure 3.1.1 Assessment of pain is a part of every veterinary consultation.

Protective mechanisms when an animal is in pain occur for the following reasons:

1. To reduce or avoid the damage
2. To reduce the likelihood of pain recurrence
3. To promote recovery

Physiological mechanisms of pain production

There are two physiological mechanisms which enable an animal to feel pain: peripheral and central.

Peripheral mechanisms (tissue stimulation)

Skin, muscle, bone and other tissues have thousands of nerve endings. Stimulation of these nerves generates signals which travel to the spinal cord and brain within seconds.

If the signal is 'pain' an appropriate physiological and/or behavioural response occurs, such as withdrawal of the affected limb.

Tissues can be stimulated in two ways

- Non-noxious (non-painful) stimulation (e.g. touch) is used by the animal to make it aware of its immediate surroundings. This rarely produces pain unless the nerve fibres are sensitised, for example by chemicals released during the inflammatory process ('hyperalgesia' – see below).
- Noxious (painful) stimulation (mechanical, thermal, electrical, chemical) is detected by pain receptors called nociceptors which convert painful stimuli into electrical impulses. These electrical signals (action potentials) are transmitted to the spinal cord by thinly myelinated (A delta) and unmyelinated (C) sensory nerve fibres. The A delta nerve fibres transmit electrical impulses much faster than the C fibres and are responsible for the rapid onset of sharp pain that triggers aversion and withdrawal from the stimulus. This is often an immediate reflex that is the result of a local neuronal path which doesn't go via the brain (unconscious). Alternatively, activation of C fibres results in a slower onset pain (second pain) that in humans is associated with a dull throbbing or burning sensation. It is worth noting that visceral pain (internal pain from internal organs) is transmitted exclusively by C fibres which travel with the nerves of the autonomic nervous system.

This may help explain the exaggerated physiological responses (tachycardia, hyperpnoea, hypertension, sweating) associated with visceral pain.

- There are some very short neuronal paths, that do not go via the brain, which result in unconscious responses, such as a withdrawal reflex from noxious stimuli, and are immediate, e.g. if you touch a hot surface you withdraw your hand without thinking about it. Other neuronal pathways, especially from C fibres, go via the brain and produce more complex defensive responses, such as behavioural adaptations to pain, e.g. protecting a wound from further trauma.
- Chemical substances (prostaglandins, leukotrienes, bradykinin, nerve growth factors, histamine) produced by tissue damage and inflammation, activate and sensitise these nociceptors resulting in increased sensitisation to pain.

An exaggerated and prolonged response to noxious stimuli is called hyperalgesia (Whay et al. 2005) and the sensation of pain by normal innocuous stimuli is called allodynia (Muir 2010a) (e.g. if a wound is touched even gently it hurts).

- Moreover, severe or prolonged pain can result in central sensitisation, which again is characterised by hyperalgesia, allondynia and hypersensitivity.
- Nociceptors respond to high intensity mechanical or thermal stimulation, for example pricking or stretching the skin, or extreme temperatures. Chemical mediators released during the inflammatory process will also sensitise nociceptors. This is important to remember when choosing appropriate analgesia (see Chapter 5 Medicines).

This increased sensitisation to painful stimuli has been referred to as pain 'wind up' (Muir 2010b). It can be reduced if analgesics are given pre-emptively wherever possible, e.g. if a painful procedure is going to be performed, always give the analgesic before the procedure. This will inhibit this sensitisation of pain wind up and give more effective pain control.

Remember that pain responses will vary between individual animals. As with pain thresholds in humans, what one animal accepts as mildly painful may not be felt in the same way by another animal. This is important to remember when carrying out diagnostic examinations and procedures using sedatives and local anaesthetics.

A dose rate that works for most cases may not be sufficient in some individuals due to increased pain or stress responses.

The physiological and behavioural effects of pain will vary according to whether the skin/tissue is normal, damaged, infected or inflamed. It is important to understand the effects or lack of effects on these peripheral mechanisms when two different types of pain modifying drugs are used: aspirin-like (NSAIDS) and morphine-like (opioids).

Central mechanisms: Unconscious processing by the brain and spinal cord

Pain mechanisms utilising central pathways result in a pain response from the spinal cord and brain. Nerve fibres from nociceptors reach the grey matter of the spinal cord, and contribute to local spinal reflex responses such as withdrawal from the stimulus. Alternatively the response may progress to the brain, leading to complex defensive responses.

Pain duration

Acute pain

Acute pain occurs immediately with injury or trauma and disappears when the injury heals.

Pain can usually be attributed to either the 'somatic' (musculoskeletal system) or 'visceral' (smooth muscle) systems. Acute pain is detected as being one of the five signs of acute inflammation (see Chapter 5) and is usually easy to detect if external (somatic). It is often accompanied by heat, swelling, redness and loss of function in the affected area.

Chronic pain

Chronic pain occurs when an animal's physiological and behavioural responses are unsuccessful in alleviating the pain.

Attempts to overcome such pain can often result in permanent structural or physiological changes. This is important to consider when attempting to provide an equid with medicinal relief from chronic pain, for example that seen with osteoarthritis.

Chronic pain is usually a lot harder to recognise or evaluate. However, the following signs should alert a clinician to the possibility that the animal has been in pain for some time:

- Changes (decreases) in responses to outside stimuli (depression) (see Figure 3.1.2)
- Changes in eating and drinking
- Changes in sleeping or recumbency times
- Changes in social behaviour
- Weight loss
- Other signs such as hard swellings of joints and tendons

Mechanisms for coping with pain

When animals are experiencing chronic pain, they may reduce the severity in a phenomenon known as a 'coping mechanism'.

It is unclear how such mechanisms work and when they are used although it is thought to involve the central nervous system.

Such 'coping mechanisms' in chronic pain can be so effective that physiological and behavioural changes of the animal are only detected when these mechanisms are suppressed or temporarily overpowered. This is sometimes referred to as 'breakthrough pain'.

Stress-induced analgesia has been demonstrated but its significance for pain relief in different species is unclear.

Figure 3.1.2 Chronic pain can be hard to evaluate.

Types of pain responses

An animal may adopt one or more of the following in an effort to cope with pain:

1. Behavioural changes in which the animal reduces or avoids the recurrence of the pain experience. This involves emotional experiences and learning, for which high-level central nervous functions are required. Examples include running away, or trying to remove or reduce the cause by licking, biting or attacking its source.
2. Automatic reflex responses/reactions which protect the animal This is common with thermal stimuli, for example the automatic withdrawal from a hot firing iron.
3. Responses which minimise pain and assist healing e.g. lying down, standing very still or by adopting some other characteristic posture. To enable this, the animal may move away or hide.
4. Protective responses These are designed to elicit help or to stop another animal (including human) inflicting more pain. For example, communication via vocalisation, posture or smell.
5. Absence of well-established behavioural responses due to the continuing pain being predominant. This may lead to failure of social interactions, unresponsiveness to commands and inattention.

3.2 Indicators of pain

Pain assessment

How to determine how much pain an animal is suffering

When we first observe any working equid the question of whether the animal is experiencing pain, and how much, should always be considered.

Figure 3.2.1 Is this animal in pain?

Subjective assessment

This is an assessment of pain levels based on what the clinician thinks the animal is feeling, rather than any measurable indicators. Evaluation of pain will improve with:

- an acceptance that animals do feel and experience pain
- knowing the species, breed, work-type and individual animal well
- learning the characteristics of pain-associated behaviour
- treatment experience
- considering the possibility that pain is present in all consultations with working equids and taking the appropriate action to alleviate it

Objective assessment

This uses specific measurements to identify the animal's level of pain

1. Measures of general body function such as food and water intake

- Sudden decreases in eating/drinking in the period before the owner presented the animal can be significant
- Changes in eating/drinking patterns with the commencement of analgesia
- Changes in normal grazing behaviour

2. Measures of behaviour (Figure 3.2.2)

- Anxiety
- Restlessness
- Flehmen response (upwards curling of the upper lip)
- Depression
- Aggression

Aggression has been strongly associated with pain (Ashley et al. 2005), as a genuine response to pain on palpation, as a fear response in anticipation of a pain related stimulus, or through a learned association.

The instinctive response of an equid to an aversive stimulus is flight; however, if confined, the only possible defence for the animal is to attack the source of the pain.

Figure 3.2.2 Observe the behaviour of each animal before examination.

Equids in severe, unrelenting pain can become difficult to handle with little consideration for other people and animals. This should always be considered in aggressive animals, and a careful clinical examination should be performed. If in doubt, administer analgesics.

3. Measures of physiological responses

These can be unreliable so do not base decisions on these alone; always consider in the context of a complete examination. In the field, it is extremely difficult and unnecessary to rely on invasive testing to determine pain levels.

- Heart rate
- Respiratory rate
- Catecholamines
- Corticosteroid
- Beta-endorphines
- Cortisol

Cortisol is often measured to assess pain responses in animals under experimental conditions; however, measurement of this hormone in a clinical context is impractical and it has shown to be an unreliable indicator of pain as many other factors can affect it (Molony and Kent 1997).

It is important to remember that increased cortisol levels as seen in pain and stress will have a detrimental effect on an animal's immune system.

Cortisol not only inhibits healing and repair but also inhibits the animal developing an appropriate immune response to pathogens and makes it more susceptible to opportunistic infections.

Practical assessment

For practical assessment of pain under field conditions, assess individuals or groups of equids on the following points:

- Look at the interaction of animals and their individual demeanour.
- Assess any abnormal activities or postures, including the position of limbs (Figure 3.2.3), head, neck, ears and tail.
- Identify and assess any changes in gait.
- Approach the individual animal to observe the response to disturbance (evoked behaviour). Look for decreased flight distances and the speed of response to the threat.

Figure 3.2.3 Observe the posture of all limbs from a distance.

Equids showing reduced responses may be in pain.

- Look for signs of poor body, skin and coat condition, presence of external parasites, wounds, or other signs of disease.
- Look for physiological signs such as altered respiratory effort (including increased rate, depth, gasping, open-mouthed breathing, panting), sweating, trembling, increased muscle tone, dilated pupils, wide-open eyes, depression and aggression towards observer, particularly in response to touch.
- Note any physiological, environmental or husbandry conditions that could also account for any of the observed signs, e.g. pregnancy, heavy rain.

- Seek the owner/carer's assessment of the animal and note his/her competence and co-operation.

Why is it important to recognise pain-associated behavioural changes?

> The recognition of pain-associated behavioural changes is a vital tool for pain detection and management.

Knowledge of normal versus abnormal equine behaviour is necessary. However, it can often be difficult to detect altered demeanour in working equids as they typically follow a restricted schedule that is different from the activities they would engage in if they had free choice.

> An owner will know his animal better than anyone else so, if an owner says the animal is acting abnormally, they should, generally, be taken seriously.

Clinical examination must prioritise pain assessment and help owners see and believe that pain is real. Good communication is the key. Below are descriptions of different pain signs, also refer to Ashley et al. (2005).

- Generalised signs These may include excitement, circling, pacing, depression, fear, reluctance to be handled, reduced social behaviour, reduced movement, reduced food or water intake, playing with food and water, 'snapping' jaws or grinding teeth, difficulty or reluctance in standing up or lying down, increased or decreased lying down times, rigid stance, tension evident in face or muzzle, staring or rolling eyes, flared nostrils, increased respiratory rate, muscle tremors or sweating.

> Changes in normal behaviour often indicate pain, although this varies greatly between species and individuals.

- Head/dental pain Signs include difficulty picking up, holding or swallowing food, retaining food in the cheek pouches, dropping uneaten food from mouth (quidding), standing over food or water but not eating or drinking, chewing on one side, head-shyness, reluctance to open mouth, reluctance to work or accept the bit, scratching or rubbing the face, head-pressing or head-shaking, depression, and inappetence (lack of appetite).
- Abdominal pain (colic) Signs include looking at flanks (Figure 3.2.4), pawing the ground, kicking the belly, rolling, collapsing, leaning against walls, stretching, grunting, grinding teeth, lying on back (especially foals), depression, inappetence, and anorexia. Abdominal pain can lead to quite violent behaviour.
- Skin pain Itching, rubbing and other signs of self-trauma, swelling and redness, exudate, secondary infection and alopecia or thickening of skin. There could be evidence of reluctance to move or other gait abnormalities due to tension of the skin over certain areas of the body, depression inappetence, guarding/protecting the area when attempts are made to touch/examine it.
- Ear pain Dropping or swelling of the pinna (Figure 3.2.4), discharge, wet hairs, shaking or rubbing of the head and evasion when the head area is handled, depression, inappetence, guarding/protecting the area when attempts are made to touch/examine it.

- Eye pain Wet eyelashes, excessive tear production, ocular discharge (Figure 3.2.4), blepharospasm (holding eye closed), drooping eyelid, head-shyness, fear of handling, photophobia (light avoidance), rubbing eye or side of the head, depression, inappetence, guarding/protecting the area when attempts are made to touch/examine it.
- Limb pain Signs include overt lameness (limping), shortened stride length (especially when turning), uneven weight distribution, pointing or resting a forelimb, pointing a hindlimb, shifting weight, lifting foot off ground (Figure 3.2.4.), dropping hip/stifle or elbow/shoulder when moving, reluctance to stand or move, reluctance to work, kicking when limb handled, limb withdrawal on palpation or with hoof testers, head nod or rigid head and neck, depression, and inappetence.

Pain assessment in donkeys

It is documented that donkeys demonstrate more subtle pain behaviours than horses; perhaps due to our current inability to interpret the more subtle behavioural changes they present with (Ashley et al. 2005). It is interesting that a similar problem has been noted in semi-feral and wild horses, where the ability to hide pain is a valuable survival technique for animals that are naturally predated.

Figure 3.2.4 Examples of: abdominal pain (top left); eye pain (top right); ear pain (bottom left); limb pain (bottom right).

More subtle pain behaviours do not mean that donkeys do not feel pain.

Non-specific behavioural indicators of pain in donkeys

- In horses, restlessness, anxiety and agitation are characteristic of severe/acute pain. This cannot be relied upon in the donkey and more subtle behaviours may be shown.
- A rigid stance and reluctance to move (likely to be a protective behaviour) has been recognised in donkeys. However, this can be over diagnosed.
- Lower head carriage is difficult to interpret in donkeys.
- Fixed stare and flared nostrils described in horses as indicators of chronic pain have not been described in donkeys.
- Aggression towards handlers, harness and other animals is strongly reported for horses and this has been described in the donkey, but tends to be more subtle (Ashley et al. 2005).

Behavioural indicators for abdominal pain in donkeys

- Vocalisation is well described in horses, but not reported in donkeys.
- Rolling is well described in horses. It is reported in donkeys but not reliable; i.e. just because a donkey is not rolling does not mean abdominal pain can be ruled out.
- Kicking abdomen is well described in horses, but not reported in donkeys.
- Flank watching is well described in horses, but not reported in donkeys.
- Dullness and depression is well described (Ashley et al. 2005).
- Lying down is commonly reported in the field.
- Stretching out whilst standing is also reported in the field (see Chapter 11).

Dullness and depression is commonly reported as the only observable behaviour change caused by abdominal pain in donkeys.

Behavioural indicators for limb and foot pain in donkeys

Weight shifting between limbs is a reliable indicator in horses and donkeys.

- The donkey may guard the affected limb.
- Abnormal weight distribution: abnormal/altered posture to alleviate limb loading e.g. placing the front feet forward of the body in laminitis. This is reported as much more subtle in donkeys.
- Abnormal movement is reported in donkeys.
- Reluctance to move is slightly associated with limb pain in donkeys (Ashley et al. 2005).

These lists are not exhaustive and as more evidence emerges we should get a greater understanding of how to recognise and interpret pain in donkeys.

With every examination consider whether the donkey is in pain or whether the condition could be painful, even if no overt signs of pain are noted.

If there is any possibility of pain, analgesics should be included in the treatment regime. Owners should be made aware of the signs of pain so that they recognise them and will be more inclined to manage pain appropriately in the short and long term.

3.3 Management and treatment of pain

Pain alleviation

What to do if an animal is in pain

> Veterinarians have a responsibility to alleviate pain and suffering.

Remember in some cases, euthanasia may be the only choice in order to achieve this (see Chapter 8). The best approach to pain is to remove the cause of the pain rather than mask it (e.g. with analgesics), where this is possible.

Owner communication, nursing and management

These aspects are of primary importance since, long term, it is the owner/carer who is responsible for ensuring the animal is comfortable, and remains that way, once the vet leaves the consultation.

- Rest Pain is exhausting and the nervous system of an animal in pain is hyper-sensitised to further pain (Whay et al. 2005). Rest allows healing to take place, minimises painful movement and helps to prevent further knocks and injuries that will increase the level of pain.
- Warmth and comfortable lying conditions Animals in pain need to be kept comfortable in order to allow them to lie for longer periods of time; minimising movement and maximising the healing process. The lying area should be clean and comfortable to cushion pressure points and prevent pressure sores, as well as protecting the animal from cold. The best way to tell if the lying area is suitable is to watch lying and rising behaviour; if the animal does not want to lie down or get up, or if it is not lying for long periods, the area is not warm or comfortable enough (unless the condition is so severe as to prevent this behaviour).
- Assisted feeding/drinking Animals in pain may need help with feeding and drinking, either by placing food and water within easy reach when they are lying down, or by hand-feeding small amounts at frequent intervals. This requires time and attention to detail by attendants in order to make sure enough food and water is consumed.
- Physiotherapy and massage Rest and extended lying periods may lead to joint stiffness, muscle cramp or congestion and oedematous swelling of the limbs. Gentle daily massage or physiotherapy can aid circulation and flexibility, enabling a faster return to normal movement when the pain

Figure 3.3.1 Good relationships and communication with owners are the key to successful nursing care and therefore a positive outcome for working equids.

has subsided. Care should be taken to look for signs of pain that may be exacerbated by physiotherapy or massage; if this occurs, avoid the painful area and focus on other body regions.

Good communication with owners and carers of working equids is essential if effective nursing and management of sick patients is to occur (Figure 3.3.1).

Analgesic drugs

In many circumstances, pain alleviation requires the use of analgesic drugs, especially in the acute stages. It is important to remember that drugs alone do not give maximal improvement in the animal's comfort.

Effective pain relief also requires management of the animal's environment (as discussed above).

There are three main groups of medicines available to relieve pain and suffering:

1. Opioids
2. Anti-inflammatory drugs
3. Local anaesthetics

Refer to Chapter 5 for more information on specific drug actions.

The administration of analgesics must be an informed decision. Know the drugs that are available and the pharmacological and physiological effects they induce. Knowledge of expected efficacy will greatly improve the ability to alleviate an animal's pain and suffering.

Remember that removing the source of the pain is the first priority. Analgesics will mask signs of pain and will make an animal feel temporarily better, but will not cure the cause of pain. In some instances it is not possible to remove the cause of pain, e.g. with chronic joint arthritis. However, the effects can still be minimised through good foot trimming and farriery, reduced work load and improved working conditions.

Owner education and compliance is the key to success.

Remember that, even if there is no other option than the provision of long-term pain relief medication to make an animal comfortable, all analgesics have detrimental side effects that become more evident with increasing dose and duration of treatment. Additionally, by masking the pain, the animal will no longer protect the affected region meaning that further damage is more likely. Both of these facts should be considered when long-term pain relief treatment is advised and they should be fully explained to owners.

Effective pain management is absolutely critical in improving working equid welfare.

Pain management should be at the fore of every veterinarian's mind. No painful veterinary procedure should be performed without careful consideration as to whether it can be avoided (harm-benefit analysis) and, if it is essential, how the pain can be ameliorated during the process.

Response to analgesia

All animals requiring pain relief must be monitored carefully and their pain control plan re-evaluated regularly, either through re-examination or owner communication.

1 Observe behavioural changes once analgesics have been administered to confirm that the presence of pain has been alleviated. Assess pain levels, e.g. if an animal becomes much brighter following pain relief this is a good indication that the animal was in pain before this medication and that the medication has helped to alleviate the pain.

2 The volume, route and potency of the selected analgesia will determine how quickly a response to treatment can be expected, and can help assess original pain levels.

3 Remember to be aware of the duration of action. Most drugs which alleviate pain are only effective for a few hours. Ensure that the animal is reassessed before the analgesia wears off, and then decide on the next step.

4 Be aware of the deleterious side effects associated with analgesics. Side effects should be minimised by ensuring that the correct dose, preparation, dose frequency and route of administration is followed for each drug (see Chapter 5).

Ensure a long-term treatment plan exists if you intend to use analgesia. Is it practical in the long term?

In the case of chronic pain in working equids, consideration of the use of long-term analgesia has to be monitored carefully (Figure 3.3.2). See Section 3.4 of this chapter for a case study on chronic pain management.

It is the ultimate responsibility of the veterinarian to relieve pain and suffering.

In acknowledging that equids have the capacity to experience pain, a veterinarian is obligated to minimise its occurrence through prevention and treatment.

Figure 3.3.2 In all examinations consider chronic pain management.

If it is possible that an animal is in pain give the animal the benefit of the doubt. Administer appropriate treatment and advice to the owner to protect its welfare.

Veterinarians can promote:

1. Refinements in animal care

- Discuss general use/care of the animal with owners/users.
- Advise on appropriate management practices:
  - Water provision
  - Best possible diet based on what is available
  - Regular removal of faeces and urine-soaked bedding
  - Dry and clean equipment
  - Comfortable environment (stable, bedding, quiet, light, good ventilation)
  - Fly control

2. Provision of anaesthetics and analgesics Bearing in mind what is locally available always do what is best from the animal's viewpoint, minimising the pain of diagnostic and treatment procedures.

3. Refinements in local procedures intended to improve animal welfare Is the owner performing procedures/mutilations that are painful and detrimental to the animal (see Figure 3.3.3)? What actions can be taken if it is known that painful practices are occurring? In what way does the community feel that they benefit from adopting these painful practices? These are all important issues to raise in veterinary or programming meetings. It is also beneficial to work with community development teams in order to address such matters. See Section 2.4 for ways to overcome harmful practices.

Figure 3.3.3 Firing, which causes pain and suffering, is a common practice in many parts of the world.

Pain management in donkeys

Physiological differences exist between donkeys and horses which affect the pharmacokinetics of certain drugs.

Donkeys have a different metabolic capacity for specific drugs compared with horses (Scarth et al. 2012). For some drugs, e.g. phenylbutazone (PBZ), an increased frequency of dosing is required as PBZ is cleared from the body of donkeys 5–15 times faster than horses (Cheng et al. 1996a, Lizarrago et al. 2004). (See Chapter 5.)

Always check species' specific dosing regimens.

Unfortunately, dosing regimens for many drugs for donkeys and mules are currently extrapolated from horse data, due to lack of research into all species.

Fewer adverse drug reactions are noted in donkeys compared to horses; however, there have been reports of injection site reactions to oil-based formulations, unbuffered solutions, and suspensions (Lizarrago et al. 2004).

Differences in drug metabolism and dosing in donkeys for the common non-steroidal anti-inflammatory drugs (NSAIDs) available in the field

Refer to Table 3.3.1 and Chapter 5 for differences between dose rates for some commonly used NSAIDs.

It is very important for effective pain relief that dose rates and frequencies are appropriate for the species.

NSAID	Dosing frequency
Phenylbutazone (PBZ)	Data suggests dosing should be more frequent for donkeys than horses, as donkeys eliminate PBZ faster than horses (Cheng et al. 1996a). However, take care to avoid toxicity.
Flunixin meglumine	Dosing should be more frequent for donkeys than horses. (Cheng et al. 1996b).
Ketoprofen	Dosing should be more frequent for donkeys than horses, due to the increased clearance of the drug from donkeys' bodies and the fact that they have larger volume distribution than horses. However, the same dose of 2.2 mg/kg IV produced similar pharmacokinetics results in both species (Oukessou et al. 1996).
Carprofen	Donkeys require a reduced dosing rate than horses as they metabolise this drug more slowly than horses (Coakley et al. 1999).

Table 3.3.1 Information on commonly used NSAIDs for which frequency of dosing differs between horses and donkeys.

Case study – Chronic pain

3.4

Case of a burnt donkey

Location Mwea, Kenya

Attending veterinarian Dr Mary Gichure

History

The owner, Salim, reported that his two donkeys had been burned. In this area of Kenya, January is the harvesting season for rice. The by-products of rice (straw, hay and husks) do not fetch a good price at market hence farmers burn them to prepare the land for the next planting season. A burning heap looks greyish (like ash) from the outside yet inside the heap is red hot. Salim's two donkeys were left loose after a days' work and they strayed into a burning heap, sustaining serious burn wounds.

Figure 3.4.1 Salim's donkey with the burn wounds; the donkey is in a poor body condition.

Examination

One donkey was burnt on all the ventral body areas (abdomen and genital areas as well as limbs). The other donkey had burn wounds on the limbs only (Figure 3.4.1).

After examination, the veterinarian recommended euthanasia of both donkeys. The main reasons being:

- the degree of pain that the donkeys were suffering
- the poor hygiene and open wounds that would pre-dispose the donkeys to infections (considering the donkeys are not housed)
- complications that would arise due to this condition like tetanus, arthritis, and wound contracture
- shock due to the large area with open wounds that were bleeding.

Salim denied consent for euthanasia and requested the veterinarian to 'do anything to save these donkeys besides putting them down. They were given to me as a present and I am ready to take care of them in whatever way. In case they die, during treatment, then, I will be comfortable knowing that at least I did something to help them. As long as they are feeding, it means they still have the will to live'.

Outcome

The first donkey with the more severe ventral abdominal wounds died the following day. A course of treatment was commenced for the second surviving donkey.

Treatment

- Daily washing with a solution of Povidone Iodine
- Application of Clotrimazole/Gentamycin/Betamethasone ointment to wounds
- Amoxicillin trihydrate 15 mg/kg injection for the first 3 days
- Flunixin meglumine injection for the first day and during follow-up visits

Salim was taught home-based daily wound care. This involved daily examination of the wounds, cleaning the wounds with a solution of Povidone Iodine and topical application of ointment. He was also to note any changes and report the progress of the donkey to the veterinarian.

The donkey was rested and Salim was able to get another donkey to work with (as a donation from one of his group members), in order to sustain his income.

Follow-up

The wounds were slow to heal (Figure 3.4.2). One of the reasons for this was due to the location of the wounds over the joints. Every time the donkey flexed and extended his joints, the skin stretched which resulted in delayed healing.

Figure 3.4.3 shows a closer view of the limbs during a follow-up visit 3 months later. The wounds were still not fully healed. Notice the left hind hoof which shows re-growth since the initial hoof fell off after burning. Notice also the swollen joints – evidence of arthritis.

Figure 3.4.4 shows the donkey 5 months after initial treatment. Notice the rice husks stuck to the wounds on the limbs, evidence that the wounds have not completely healed, although there is good progress. The arthritis complication is evident.

Discussion

Salim's readiness to take care of his donkey went a long way in prevention of other complications and aided the healing of the wounds. Today, the donkey has recovered and has acquired a new walking style (like tip-toeing) due to the chronic arthritis as a complication of this case and is not used for work.

Figure 3.4.2 Salim with Dr Mary during a follow-up visit to review progress.

Figure 3.4.3 The wounds on the limbs showing delayed healing.

Figure 3.4.4 The donkey in June 2012 (5 months after the burning incident). Notice the improved body condition compared to the Figure 3.4.1.

Challenges of dealing with this case

- The owner did not necessarily understand the extent of pain experienced by his donkey, hence leaving the animal to suffer from chronic pain.
- The value of the donkey after recovery is reduced, because of the remaining condition; it cannot be used for work. In this case, the owner did not seem to mind this; according to him, he saved his donkey.
- The donkey nowadays is left to roam around the town since it is not housed; therefore it is exposed to the danger of road accidents which are very prevalent in this area.

The veterinarian advised the owner to provide a place to shelter his donkeys so that they do not stray into danger again. Housing is a major issue in this small urban centre since most donkey owners only go there to work. The accommodation in which they live does not have any provision for donkeys to shelter at night, and hence they are left to roam.

This case study focuses on a number of issues that many working equid veterinarians are faced with daily:

- Poor management of working equids resulting in serious injuries (e.g. roaming)
- Refusal of owners for euthanasia (ignorance, economic, cultural, religious, social, peer-pressure) (see Chapter 8 for more discussion on euthanasia)
- Management of chronic pain (animals still working)
- Management of non-healing wounds
- Owner compliance (communication and relationship), see Chapter 1

3.5 References

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Further reading

For behavioural indicators of pain in equids refer to:

Ashley, F. H., Waterman-Pearson, A.E., Whay, H.R. (2005) Behavioural assessment of pain in horses and donkeys: application to clinical practice and future studies. Equine Vet. J. 37 (6), 565–575

For further definition of terms relating to pain refer to:

Muir, W. (2010a) Pain mechanisms and management in horses. Vet. Clin. N. Am. – Equine. 26, 467–480.