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Risk Information

Horses are complex animals and while it is not possible to cover in detail all of the potential complications and risks associated with veterinary treatment, the following sections provide an outline of the major recognised areas of risk.

1.1 Twins

Mares have a twin pregnancy rate of between 3 and 30% depending on the breed of the horse. A commonly accepted rate in Thoroughbred mares in Australia is 10 - 15%.

Mares that are allowed to carry twin pregnancies are likely to suffer complications as a result. They frequently abort twins or if they give birth to live twins the mares are more likely to suffer dystocia (foaling difficulties), retained foetal membranes and decreased live foaling rates in the following season. Twin foals suffer a higher rate of stillbirth, and those born alive are usually smaller, weaker, and more susceptible to infection with and slower to development than singleton foals.

Due to these factors, it is commonly accepted practice to identify twins by ultrasonography and manually ablate one by rectal palpation and manipulation during the mobility phase of the pregnancy (up to 16 days).

This procedure has a high success rate but occasionally can result in the loss of both embryos.

There is some evidence reported in the veterinary scientific literature to indicate that this manual ablation procedure is associated with a lower live foaling rate when performed on older mares compared to the general population of mares; however it is generally accepted that the benefits of the procedure outweigh the potential disadvantages.

HEV veterinarians are aware of the risks of this procedure and act to manage these risks.

For a variety of reasons, including asynchronous double ovulations, mobility of the embryonic vesicles, the presence of cysts in the uterus and limitations of the facilities and technology, it is not always possible to detect twins or multiple pregnancies.

HEV veterinarians are aware of the possibility of twin conceptions and they take all reasonable steps to examine the reproductive tract of the mare for twins at each examination.

While the risk of twins or multiple pregnancies not being detected is small and is decreased by repeated ultrasonographic examinations, horses have the capacity for variation in their anatomy and physiology.

As a result, it is not possible to give guarantees that a particular mare is not carrying twins.

1.2 Rectal Palpation/Per Rectum Examination

Rectal palpation is an important and commonly performed procedure in equine veterinary practice. It is primarily used in determining the reproductive status of mares combined with ultrasound as part of the reproductive management of mares, but is also used in the diagnosis of other clinical conditions such as colic.

Horses are complex and at times unpredictable animals and due to their temperament and anatomical features, all rectal palpations carry the recognised risk to the horse of a "rectal tear".

A rectal tear involves damage to one or more tissue layers of the rectal wall, up to and including the full thickness of all tissue layers.

Depending on the extent of the tissue damage, the consequences of a horse suffering a rectal tear can range from minor, to serious illness requiring major surgery, to death.

HEV Veterinarians are aware of the risks and potential consequences of rectal palpation and act to minimise these risks as far as is practically possible.



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Occasionally and in spite of all precautions, horses can suffer a rectal tear while undergoing rectal palpation. This most commonly occurs in young horses and in male horses; however it can happen to any horse undergoing the procedure.

In some cases the veterinarian may feel the tear take place during the palpation or may see evidence of blood on the glove at the completion of the procedure; however in other cases a tear may occur without the veterinarian being aware of it.

If the veterinarian is aware that a rectal tear has occurred, they will take immediate steps to diagnose the extent of the tear and to begin treatment of the horse.

If the veterinarian is unaware that a rectal tear has occurred, it may take some time before the horse presents with clinical signs which alert the owner, horse staff or veterinarian to the injury and allow diagnosis of the extent of the tear and treatment to begin.

Unfortunately, due to the nature of rectal tears and the severe consequences which result from them, many horses which suffer partial-thickness tears and most horses which suffer full-thickness tears do not survive, in spite of intensive medical and surgical treatment.

1.3 Equine Sedation and Anaesthesia for Surgery Risks

In order to safely perform surgical procedures on horses it is usually necessary to immobilize the horse. This is achieved by a combination of sedation and local anaesthesia or by general anaesthesia.

Sedatives and anaesthetics are powerful drugs which act on a wide range of organ systems including the brain, heart, blood vessels and lungs to achieve their effect. The interactions of sedative and anaesthetic drugs with these organs and the other tissues of the body are complex and occasionally unpredictable.

As a consequence, treatment with these drugs requires an assessment of the clinical status of the horse and can lead to unexpected reactions in individual horses.

Before agreeing to sedation and anaesthesia of your horse, it is important that you understand that the use of all sedative and anaesthetic drugs may involve risk to the patient.

Horses are complex animals and while it is not possible to detail all the potential complications associated with sedation and anaesthesia; the following is an outline of the recognised areas of risk.

The risks and complications associated with equine sedation and anaesthesia are closely linked with the risks and complications involved in equine surgery.

This information on Sedation and Anaesthesia Risks should be read in conjunction with the attached information on Surgery Risks.

Risks and Complications Related to Sedation

Sedation involves the administration of drugs, which alter the level of consciousness of the horse and its ability to perceive the effects of surgical and other procedures. Sedation may be necessary to ensure animal welfare, pain relief and safety.

All sedative procedures of horses have the following potential complications: anaphylactic ("allergic") reaction, collapse, excitement, iatrogenic injury.

The consequences of a horse suffering one or more of these conditions can range from minor to fatal, depending on the degree to which the horse is affected and the organ system involved.

HEV Veterinarians are aware of the risks and potential consequences of sedation and act to manage these risks as far as is practically possible.

Occasionally and in spite of all precautions, horses suffer one or more of these complications when they undergo sedation. This most commonly occurs when the horse is already suffering from disease or injury, is very young, is an older animal or has an "excitable" temperament; however it can also happen to horses which appear fit and healthy and show no signs of compromise prior to anaesthesia.



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1. Allergic Reaction: Horses can have an allergic reaction to any medication they receive. The extent of the reaction can range from mild skin wheals to collapse, inability to breathe and death (anaphylaxis).
2. Collapse: Individual horses may be more sensitive than expected to the effects of sedative drugs and may stumble or fall when sedated. This can result in injury to the horse.
3. Excitement: Sedative drugs can occasionally result in an excitement reaction in the horse. These reactions can range from mild muscle trembling to frenzied, uncontrollable activity and severe injury.
4. Iatrogenic Injury: Any procedure involving horses, especially young, unhandled and fractious animals can result in accidental injury to the horse.

Risks and Complications Related to General Anaesthesia

General anaesthesia is relatively high risk procedure in the horse with world-wide studies showing overall approximately 0.9 % peri-operative fatality rate in non-colic horses undergoing anaesthesia. This rate is significantly increased for horses undergoing emergency surgery such as colic.

Due to the effects of the drugs and the size and temperament of the horse, all general anaesthesia procedures are accompanied by General Risks.

Certain procedures and classes of horses are associated with increased levels of anaesthetic risk and potential complications. This information should be read in conjunction with the information related to the risks associated with surgery.

General Anaesthesia Risks

All anaesthesia procedures have the following potential complications: cardiac arrest, tissue damage, bone fractures, iatrogenic injury. These complications can happen at induction of anaesthesia, during anaesthesia or during recovery from anaesthesia.

The consequences of a horse suffering one or more of these conditions can range from minor to fatal, depending on the degree to which the horse is affected and the organ system involved.

HEV Veterinarians are aware of the risks and potential consequences of anaesthesia and act to manage these risks as far as is practically possible.

Occasionally and in spite of all precautions, horses suffer one or more of these complications when they undergo anaesthesia. This most commonly occurs when the horse is already suffering from disease or injury, is very young, is an older animal or has an "excitable" temperament; however it can also happen to horses which appear fit and healthy and show no signs of compromise prior to anaesthesia.

1. Cardiac Arrest: Anaesthetic drugs act by depressing the action of the heart and other organs, occasionally horses can be unexpectedly sensitive to the effects of the drugs and may suffer a cardiac arrest. Cardiac resuscitation is extremely difficult in the horse and arrest is usually fatal.
2. Tissue Damage: tissues including skin, muscle, nerve and eyes can be injured during the anaesthetic procedure including during the induction and recovery phases.
3. Myopathy / Neuropathy: these complications can occur usually in large heavy muscled horses and are thought to be associated with muscle or nerve damage associated with pressure and/or lack of blood flow. Areas that are dependant during anaesthesia are usually affected. The consequences of this complication will vary depending on the severity of damage. Rarely, the



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horse is unable to stand during recovery and this can be fatal. In most cases, these complications can be managed using appropriate positioning and padding of the patient during anaesthesia and ensuring blood pressure is supported.

4. Post anaesthetic colic: may occur secondary to reduced gut motility associated with general anaesthetic drugs. This may be mild and transient but can reduce faecal output and can lead to caecal impaction and rupture that is fatal.

5. Bone Fractures: Due to their size and temperament, horses can break bones during an anaesthetic procedure. This most commonly occurs during recovery when a horse attempts to stand while it is uncoordinated and still suffering from the effects of the anaesthetic drugs. Fracture of a long bone/s of the leg of the horse or other major bones usually results in euthanasia.

6. Iatrogenic Injury: Any procedure involving horses, especially young, unhandled and fractious animals can result in accidental injury to the horse.

Specific Anaesthesia Risks

While the general complications are a risk with any anaesthesia, they can be more likely and potentially more serious in certain classes of horses and when certain procedures are performed.

Age

Newborn foals have immature physiological systems which mean they are more susceptible to the adverse effects of the anaesthetic drugs and any illness they may be suffering from.

Horses over the age of 14 years have an increased risk of complications associated with general anaesthesia and are more prone to the risk of long bone fracture in recovery.

Length of Anaesthesia

Horses that are anaesthetised for periods greater than three hours have an increased risk of anaesthetic complications including muscle damage, long bone fracture and death.

Type of Surgery

Horses that are anaesthetised for emergency surgery, especially Caesarean section and colic surgery have a significantly increased risk of anaesthetic complications and death.

Horses that are anaesthetised for the surgical repair of bone fractures have an increased risk of anaesthetic complications and death.

Sick Horses

Horses with underlying illness have less effective organ function and are more susceptible to the adverse effects of the anaesthetic drugs so have an increased risk of anaesthetic complications.

1.4 Equine Surgery Risks

Surgical procedures are frequently necessary in the treatment and management of disease and injury of horses.

Before providing consent for surgery to your horse, it is important that you understand that all surgical procedures involve some risk to the patient.

Horses are complex animals and while it is not possible to detail all the potential complications associated with surgery; the following is an outline of the recognised areas of risk.



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The risks and complications associated with equine surgery are closely linked with the risks and complications involved in anaesthesia and sedation.

Risks and Complications Related to Surgery

Surgical Risks are divided into General Risks, which accompany all surgery and Specific Risks which are related to a particular procedure or class of horse.

General Surgical Risks

All surgical procedures have the following potential complications: haemorrhage, infection, pain, neurological problems and iatrogenic or inadvertent injury. The consequences of a horse suffering one or more of these conditions can range from minor to fatal, depending on the degree to which the horse is affected and the organ system involved.

HEV Veterinarians are aware of the risks and potential consequences of surgery and act to manage these risks as far as is practically possible.

Occasionally and in spite of all precautions, horses suffer one or more of these general complications when they undergo surgery. This most commonly occurs when the horse is already suffering from disease or injury, is very young or is an older animal; however it can also happen to horses which appear fit and healthy and show no signs of compromise prior to surgery.

General surgical risks include:

1. Haemorrhage

Surgical procedures can result in bleeding or haemorrhage from the surgical site. This can range from minor bleeding of little consequence to severe haemorrhage that could potentially be life threatening. Circulatory blood volume is maintained during anaesthesia using intravenous fluid therapy and in some surgical cases where increased blood loss may be anticipated, blood transfusion may be performed during surgery. However, in an emergency situation donor blood is usually not available in horses and severe haemorrhage can be fatal.

2. Infection

Bacterial tissue infection can occur following surgical procedures. Risk of infection is significantly increased with tissue trauma, compromised patients, prolonged surgery times, and surgical implants such as orthopaedic plates and screws. Antibiotics are commonly administered prior to and after a surgical procedure to reduce the risk of bacterial infection. Occasionally, and in spite of all precautions infection can occur that can range from minor wound infection to systemic infection that could lead to other complications eg septic shock, endocarditis, that may require intensive treatment and could potentially be fatal.

3. Pain

All surgical procedures are invasive and will stimulate a pain response in the patient. In order to safely perform surgical procedures on horses a combination of sedation and local anaesthesia or general anaesthesia is necessary. Sedative and anaesthetic drugs provide an analgesic or "painkilling" effect which varies depending on the drugs used. Non steroidal anti-inflammatory drugs (NSAIDs) such as phenylbutazone are also routinely administered prior to surgery to help reduce any pain response. Controlling pain is very important and significantly reduces the risk of complications during and in recovery from anaesthesia as well as minimizing stress for our equine patients and providing for their welfare.



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4. Neurological Problems

Damage to nervous system is a rare complication associated with surgery. Very rarely damage to the brain or spinal cord (central nervous system CNS) may occur associated with spread of blood clots from a surgical site. Damage to the CNS may also occur if there is decreased blood supply ie severe haemorrhage or decreased oxygenation of the blood. Acute blood loss can occasionally cause blindness that may be permanent and irreversible. Additionally, myopathy or neuropathy may occur occasionally as a complication of general anaesthesia. This can rarely result in a horse that is unable to stand in recovery and may lead to death.

5. Iatrogenic / inadvertent Injury

Accidental injury may occur in any procedure and accidental tissue damage may occur during any surgical procedure. The consequences of this injury will depend on the tissue involved.

Specific Surgical Risks

Castration

Castration involves surgical removal of the horse's testicles.

Whilst castration is a "routine" procedure very commonly performed on colts for management reasons, there are potentially serious complications associated with castration in horses.

Accurate identification and signed consent form is mandatory before castration will be performed on any horse.

Castration may be performed by either an "open" or "closed" technique.

Choice of technique is dependant on the facilities available, age and type of the horse and preference of the veterinary surgeon. Potential complications exist with both techniques.

"Open" castration can be performed under general anaesthesia. Potential complications associated with "open" castration include swelling, bleeding or haemorrhage, infection and herniation or evisceration (release of internal tissue or bowel through the wound). Minor complications such as swelling of the scrotum and sheath or local infection are common and most often require little or no treatment. However, occasionally more serious complications can occur including severe haemorrhage or more rarely herniation of intestine. These complications can be life threatening and emergency treatment may be necessary to save the horse.

"Closed" castration is performed under general anaesthesia and involves placement of a suture around the spermatic cord before emasculation (removal of the testicle). This technique reduces the risk of serious haemorrhage, herniation of the intestine and often reduces post-operative swelling.

"Closed" castration requires increased surgery time and the placement of sutures which can increase the risk of infection. Closed castration is generally recommended in cases where there may be an increased risk of complications associated with the "open" technique, such as castration of an older horse or where a scrotal hernia is suspected.

Surgery of the eye

Surgical treatment of the eye or adjacent structures is performed for a variety of conditions including injury and infection.

Surgical treatment of eyes is most often performed under general anaesthesia but minor procedures such as the placement of eye treatment tubes (subpalpebral treatment tubes) may be performed on the standing horse using sedation and local anaesthesia.

All surgical procedures of the eye or close to the eye, carry the risk of inadvertent injury to the structures and tissues of the eye and inflammation that could lead to loss of vision.



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An increased risk of "bradycardia" (slow heart beat) and occasionally "cardiac arrest" have been associated with eye surgery due to stimulation of the vagus nerve. Local nerve blocks, topical local anaesthesia, non-steroidal anti-inflammatory treatments are utilized in addition to careful monitoring of general anaesthesia to minimize this risk associated with eye surgery. Sub-palpebral lavage tubes ("eye treatment tubes") are frequently used to aid medical treatment of the eye. These tubes are well tolerated by most horses but occasionally cause irritation and rubbing that may result in self-inflicted trauma to the eye.

1.5 Antibiotic Therapy Risks

Antibiotics are powerful drugs that are commonly used to treat infection in horses.

Before agreeing to antibiotic treatment for your horse, it is important that you understand that the use of all antibiotic drugs involves some risk to the patient.

Horses are complex animals and while it is not possible to detail all the potential complications associated with antibiotic therapy; the following is an outline of the recognised areas of risk.

It is important that antibiotics are used in the manner in which they are prescribed and that specific instructions are exactly followed.

Risks and Complications Related to Antibiotic Therapy

Antibiotic Therapy Risks are divided into General Risks which accompany all Antibiotics and Specific Risks which are related to a particular type of drug.

General Antibiotic Risks

There are many different classes and types of antibiotics but all drugs may result in the following complications: colitis, pain, muscle injury, abscess formation, thrombophlebitis, iatrogenic injury. The consequences of a horse suffering one or more of these conditions can range from minor to fatal, depending on the degree to which the horse is affected and the organ system involved.

HEV veterinarians are aware of the risks and potential consequences of antibiotic therapy and act to manage these risks as far as is practically possible.

Occasionally and in spite of all precautions, horses may suffer one or more of these general complications when they undergo antibiotic therapy. This most commonly occurs when the horse is already suffering from disease or injury; however it can also happen to horses which appear fit and healthy and show no signs of compromise prior to antibiotic therapy.

1. Colitis (diarrhoea) This condition can range from mild signs requiring no treatment, apart from stopping the antibiotics, through to severe diarrhoea which may require hospitalisation and intensive care and may be life threatening. Adults are at greater risk than foals.
2. Pain or muscle injury at the injection site.
3. Abscess formation at the injection site. Abscesses may require lancing and further therapy.
4. Thrombophlebitis (infected vein): This condition can occur following catheter placement or a single intravenous injection. These infections range from mild, requiring no further treatment to more severe infections that result in the loss of the vein.
5. Iatrogenic Injury: Any procedure involving horses, especially young, unhandled and temperamental animals can result in accidental injury to the horse including the eye.



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Specific Antibiotic Risks

Many antibiotics have specific complications related to their mode of action and their interaction with the horse.

Penicillin (Benzyl penicillin and procaine penicillin)

1. Anaphylaxis/ allergic reactions occur following previous exposure/ sensitisation to penicillin. Mild signs include skin wheals or oedema to more severe signs causing the horse to drop suddenly to the ground showing breathing difficulties. This is often fatal. If the horse survives an allergic reaction penicillin should not be given again as the next dose may be fatal.
2. Procaine is the agent that stabilises penicillin for intramuscular use. If procaine is accidentally injected in the vein it will cause extreme central nervous system stimulation including frantic and uncontrollable behaviour. **This is not an allergic reaction.** Most horses survive this reaction however they may obtain severe injuries that may be fatal. Keeping the procaine penicillin refrigerated and ensuring careful injection technique will reduce this risk.
3. Autoimmune haemolytic anaemia occasionally occurs and horses may show lethargy (dull), fever, pale mucous membranes, weight loss and rarely discoloured or dark urine. Signs usually resolve once penicillin therapy has stopped, severe signs may require supportive therapy including hospitalisation, fluids or a blood transfusion.
4. Autoimmune thrombocytopenia (drug induced destruction of platelets) causes haemorrhages (red spots on gums, eyelids, vulval lips) or signs of bleeding. Signs usually resolve once penicillin therapy has stopped, rarely severe signs may require supportive therapy including hospitalisation, fluids or a blood transfusion.

Ceftiofur

Anaphylaxis/Allergic (see above)

1. Immune mediated effects – haemolytic anaemia or thrombocytopenia (see above)
2. Pain is commonly seen following intramuscular injection of Ceftiofur (Excenell™ or Accent™)

Aminoglycosides (Gentamicin and Amikacin)

1. Nephrotoxicity /kidney injury. Increased risk of nephrotoxicity is associated with length of therapy (greater than 7- 10 days), dehydration, and treatment with other drugs that affect kidney function, existing renal disease and high doses. The signs may initially be vague including failure to thrive, weight loss or abnormal blood results. Mild cases may return to normal with time and minimal therapy. Severe cases may result in kidney failure and potentially the death of the horse. These risks are reduced with ensuring correct dose is given once only per day, monitoring hydration and blood tests to monitor drug levels and kidney function.
2. Ototoxicity damage to the ear that may result in loss of hearing.

Chloramphenicol

Use of this antibiotic is restricted and cannot be used in food producing animals.

Please see "Therapeutic Risk" document for more information.

1. Long term therapy, greater than 2 weeks can reversibly affect bone marrow causing anemia (pale mucous membranes) and low white blood cell numbers.
2. Public health risks: 1 in 24,000-40,000 people develop a fatal idiosyncratic (specific to individual person, not possible to predict) aplastic anaemia. This can occur if the drug is ingested or touches the skin of sensitive people so it is essential to use safety precautions (gloves and mask) whenever handling the drug.
3. Avoid vaccinating horses when under treatment with Chloramphenicol as it may cause vaccine failure by suppressing antibodies.

Trimethoprim / Sulphonamides

1. Anaphylaxis/allergic reactions may occur following intravenous use (see penicillin).
2. Concurrent use with detomidine sedation may affect the heart causing arrhythmias and low



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blood pressure that can be fatal.

3. Autoimmune conditions, Anaemia or Thrombocytopenia/platelet destruction(see penicillin)
4. Rapid intravenous administration can cause a rapid drop in blood pressure and may result in death. This is avoided by slow intravenous dosing.
5. Kidney damage may occur in horses that are dehydrated. Ensure horses are drinking well when treated with these drugs.
6. Anaemia has been reported in horses on long term high doses.

Tetracyclines (Oxytetracycline, Doxycycline)

1. Nephrotoxicity/ renal injury (see aminoglycosides). Risks are increased with dehydration, use of other nephrotoxic drugs and existing kidney disease. Risks are reduced when horses are well hydrated and by ensuring normal kidney function where possible.
2. These drugs result in collapse and death if given rapidly intravenously. This risk is reduced by diluting the drug with sterile saline and slow intravenous administration.
3. Tendon relaxation may occur. This will reverse with time after finishing treatment with the antibiotic.
4. Teeth may become discoloured, especially in younger animals, this may be permanent.

Macrolides (Erythromycin, Azithromycin and Clarithromycin)

1. Hyperthermia may occur in foals, particularly in hot weather, and in extreme cases can be fatal. Foals should be kept in the shade or boxed during hot periods and their temperatures monitored frequently. If a foal shows respiratory distress or has a temperature above 39.5 alcohol baths, cold hosing, or anti-inflammatories may be urgently required. Air-conditioned boxes are very useful with these foals. Please contact the treating veterinarian to help manage these foals. Signs can be seen up to 3 days after finishing the antibiotic.
2. Acute respiratory distress syndrome: signs are dramatic and appear similar to hyperthermia however clinical signs don't improve with cold hosing, anti-inflammatories or alcohol baths and may require hospitalisation and intensive care, many cases are fatal.
3. Acute potentially fatal diarrhoea in adults has been reported in mares when their foals are treated with these drugs for Rhodococcus equi (rattles). This risk can be minimised by wiping any residue from the foal's muzzle after treatment.

These antibiotics are usually not recommended in foals over 4 months of age because of the risk of "colitis"

Fluroquinolones (Enrofloxacin)

1. Arthropathies (joint disease) in foals causing joint effusion, pain, cartilage defects have been reported. Horses should be confined during treatment to minimise damage to joints. Please contact your veterinarian if there are any signs of joint effusion or lameness.
2. Transient neurological signs including excitability and seizures following a rapid intravenous dose. These signs are avoided by administering the dose via a slow intravenous injection.
3. Potential of inducing cardiac and CNS toxicity.

Rifampin

This antibiotic is only used in combination with another antibiotic such as Clarithromycin or Trimethoprim / sulphonamide because of a high likelihood of antibiotic resistance developing

Red staining of urine, tears, sweat and saliva. This will reverse at the end of treatment and is of no concern.

Metronidazole

1. Anorexia or reduced appetite may occur and may be reduced by wiping or hosing out any residue in the horse's mouth after the treatment has been swallowed.

If you are concerned that your horse may be suffering from complications of Antibiotic Therapy you should contact your veterinarian immediately.



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In consenting to Antibiotic Therapy for your horse, you accept that:

- All Antibiotic Therapy involves some risk.
- HEV veterinarians act to manage the risks as well as possible.
- Complications do occur and can be serious and life threatening.
- If complications occur you will be informed and advised on the best course of action.

1.6 Anti-Inflammatory Therapy Risks

Anti-inflammatories are powerful drugs that are commonly used to treat the signs of inflammation such as pain and swelling in horses.

Before agreeing to anti-inflammatory treatment for your horse, it is important that you understand that the use of all anti-inflammatory drugs involves some risk to the patient.

Horses are complex animals and while it is not possible to detail all the potential complications associated with anti-inflammatory therapy; the following is an outline of the recognised areas of risk.

It is important that anti-inflammatory drugs are used in the manner in which they are prescribed and that specific instructions are exactly followed.

Risks and Complications

Anti-inflammatory Therapy Risks are divided into General Risks which accompany all Anti-inflammatory drugs and Specific Risks which are related to a particular type of drug.

General Anti-inflammatory Drug Risks

There are three major classes of anti-inflammatory drugs, Corticosteroids, Non-steroidal antiinflammatory drugs (NSAIDs) and Polysulfated Glycosaminoglycans (PsGag's).

The use of drugs from any of these classes may result in the following complications: pain; muscle injury; abscess formation; thrombophlebitis; iatrogenic injury.

The consequences of a horse suffering one or more of these conditions can range from minor to fatal, depending on the degree to which the horse is affected and the organ system involved.

HEV veterinarians are aware of the risks and potential consequences of anti-inflammatory therapy and act to manage these risks as far as is practically possible.

Occasionally and in spite of all precautions, horses may suffer one or more of these general complications when they undergo anti-inflammatory therapy. This most commonly occurs when the horse is already suffering from disease or injury; however it can also happen to horses which appear fit and healthy and show no signs of compromise prior to anti-inflammatory therapy.

1. Pain or muscle injury at the injection site.
2. Abscess formation at the injection site. Abscesses may require lancing and further therapy.
3. Thrombophlebitis (infected vein): This condition can occur following catheter placement or a single intravenous injection. These infections range from mild, requiring no further treatment to more severe infections that result in the loss of the vein and significant scarring.
4. Iatrogenic Injury: Any procedure involving horses, especially young, unhandled and temperamental animals can result in accidental injury to the horse, including the eye which may result in damage and possible loss of the eye.



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Specific Anti-inflammatory Risks

Different anti-inflammatory drugs have specific complications related to their mode of action and their interaction with the horse.

Corticosteroids

1. Stomach ulcers may occur following corticosteroid therapy. Horses may show a reduced appetite, discomfort when eating, failure to thrive, diarrhoea and rarely, sudden death due to perforation of the stomach wall. Ulcers may also occur in the mouth, oesophagus and caecum.
2. Nephrotoxicity (kidney injury) may result from corticosteroid therapy. The signs may initially be vague, including failure to thrive, weight loss or abnormal blood results. Mild cases may return to normal with time and minimal therapy. Severe cases may result in kidney failure and the death of the horse.
3. Suppression of Immune Function may allow infectious agents to multiply unchecked and cause more severe disease requiring aggressive treatment and intensive care and can result in prolonged illness and occasionally death.
4. Joint infection can occur following injection of corticosteroids intra-articularly (into a joint). Infected joints result in lameness and swelling of the joint and are a serious and potentially fatal condition. Early recognition and aggressive treatment of the infection are vital to the horse's chance of a successful outcome. Occasionally, in spite of early and aggressive treatment, the infection is unable to be controlled and the lameness is so severe that the horse has to be euthanased.
5. Laminitis is a condition in which the soft and connective tissues of the horse's feet become inflamed and damaged. These tissue changes are permanent and result in lifelong foot issues which require therapeutic farriery management. The signs of laminitis can vary from mild lameness to severe non-weight-bearing lameness requiring euthanasia. Corticosteroid therapy has been linked in some cases to the development of laminitis.
6. Abortion/premature foaling may occur when corticosteroids are given in the late stages of pregnancy. Corticosteroid therapy in pregnant mares is usually initiated in cases of severe disease. In these cases, the severity of the illness and the progression of the disease are often responsible for the abortion.
7. Retarded growth can occur in foals suckling from mares treated with prolonged courses of corticosteroids. This condition occurs as a result of the drug being passed from the mother to the foal via the milk.
8. Increased appetite, drinking and urinating may occur as a result of treatment with high doses of corticosteroids.

Non-steroidal Anti-inflammatory Drugs (NSAID's)

1. Right Dorsal Colitis is an inflammatory condition of part of the colon which can be caused by NSAID therapy. Horses may show signs ranging from anorexia (poor or no appetite), weight loss and intermittent colic, swollen lower limbs or sudden, severe diarrhoea. Depending on the severity of the signs, horses may require aggressive intensive care and may die from the condition. Horses affected by this condition may be susceptible to further bouts if treated again with NSAID therapy.
2. The action of platelets may be inhibited by NSAID therapy. Platelets are components of blood which are involved in the clotting process. Inhibition of platelets can result in spontaneous or excessive bleeding following injury. Severe cases may require a blood transfusion.



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3. Bone marrow production of blood cells may be suppressed by NSAID therapy. Low production of blood cells may result in anaemia or poor immunity which may require intensive care including blood transfusion and antibiotic therapy.

4. Stomach ulcers may occur following NSAID therapy. Horses may show a reduced appetite, discomfort when eating, failure to thrive, diarrhoea and rarely, sudden death due to perforation of the stomach wall. Ulcers may also occur in the mouth, oesophagus and caecum.

5. Nephrotoxicity (kidney injury) may result from NSAID therapy. The signs may initially be vague including failure to thrive, weight loss or abnormal blood results. Mild cases may return to normal with time and minimal therapy. Severe cases may result in kidney failure and the death of the horse.

§• **Flunixin**

Clostridial myositis is an infection of muscle at the site of the injection. This is a potentially fatal condition and Flunixin is particularly associated with this effect. Signs include depression, elevated temperature, heat, pain and swelling at the site of the injection. Early recognition and aggressive treatment are vital to the horse's chance of survival. Occasionally, in spite of early and aggressive treatment, the infection is unable to be controlled and the condition is so severe that the horse has to be euthanased.

§• **Aspirin**

The action of platelets may be inhibited by NSAID therapy. Platelets are components of blood which are involved in the clotting process. Inhibition of platelets can result in spontaneous or excessive bleeding following injury. Severe cases may require a blood transfusion. Aspirin is particularly associated with this effect.

§• **Phenylbutazone**

Phenylbutazone has a narrow safety margin for the NSAID risks, especially in foals, ponies and dehydrated horses.

The intravenous form of phenylbutazone is irritating to tissue if accidentally injected outside the vein. Signs include heat, pain and swelling at the site of injection and can be mild or so severe as to require aggressive surgical treatment and result in loss of the vein and significant scarring. Polysulphated Glycosaminoglycans (PsGag's)

§• **Pentosan polysulphate**

Pentosan can decrease the ability of blood to clot which can result in excessive bleeding following injury. Severe cases of blood loss may require a blood transfusion.

§• **Hyaluronic Acid**

1. Haemarthrosis (bleeding into a joint) may occur following injection of Hyaluronic Acid into a joint. Horses show signs of mild to severe lameness and may require intensive care and surgical flushing of the joint.

2. Immune mediated flares may occur following injection of Hyaluronic Acid into a joint. They are an inflammatory reaction to a foreign substance within the joint. Horses show signs of moderate to severe lameness and may require intensive care and surgical flushing of the joint.

3. Joint infection can occur following injection of Hyaluronic acid into a joint. Infected joints result in lameness and swelling of the joint and are a serious and potentially fatal condition. Early recognition and aggressive treatment of the infection are vital to the horse's chance of a successful outcome. Occasionally, in spite of early and aggressive treatment, the infection is unable to be controlled and the lameness is so severe that the



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horse has to be euthanized.

1.7 Peri-neural and Intra Synovial anaesthesia Risks

1. Haemarthrosis (bleeding into a joint) may occur following injection of local anaesthetic into a joint. Horses show signs of mild to severe lameness and may require intensive care and surgical flushing of the joint.

2. Joint/synovial sheath infection can occur following injection of local anaesthetic into a joint. Infected joints result in lameness and swelling of the joint and are a serious and potentially fatal condition. Early recognition and aggressive treatment of the infection are vital to the horse's chance of a successful outcome. Occasionally, in spite of early and aggressive treatment, the infection is unable to be controlled and the lameness is so severe that the horse has to be euthanized.

3. Synovial or local infection can sometimes result from peri-neural local blocks despite HEV veterinarians taking measures to avoid these complications. Lameness and swelling around the area is a serious and potentially fatal condition. Early recognition and aggressive treatment of the infection are vital to the horse's chance of a successful outcome. Occasionally, in spite of early and aggressive treatment, the infection is unable to be controlled and the lameness is so severe that the horse has to be euthanized.

4. Needle breakage in the synovial space, (joint or sheath) or under the skin.

1.8 Endoscopy and Stomach tubing

Endoscopy and passage of a stomach tube is generally well tolerated, however on occasion horses will object to the procedure and take evasive action which may involve rearing, losing their footing or falling backwards. HEV veterinarians try to minimise the stress placed on the horse during these procedures and may opt for sedation to perform the procedure safely.