



# Anaesthesia

At Randwick Equine Centre we perform over 400 surgeries requiring general anaesthesia every year. The reasons for surgery vary widely, from orthopaedic procedures to address lameness problems, to airway surgery, to complicated castrations and emergency colic surgery. Anaesthesia of horses always entails some degree of risk to the patient and so we have carefully prepared protocols, specially designed facilities and a team of very experienced veterinarians to ensure all risks are kept to an absolute minimum.

Every horse has a thorough pre-surgery examination to ensure they are suitable to undergo general anaesthesia. This includes a routine blood test which will identify low grade infections or other problems which may increase the risks associated with anaesthesia. The patient is also accurately weighed to ensure that exactly the right doses of drugs are calculated and given. Shoes are removed to prevent the horse injuring itself recovering from anaesthesia and the surgical region is often clipped beforehand to reduce the overall anaesthesia time required.



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Shortly before each anaesthetic the horse receives a combination of sedative and analgesic drugs (premedication). This is important to reduce stress and ensure the patient is as calm and comfortable as possible before anaesthesia and to minimise post-operative pain. An intravenous catheter is carefully placed in the jugular vein so drugs and supportive fluids can easily be administered during surgery.



The horse is then walked into our specially designed padded anaesthesia induction room. The room has a door which swings out to keep the horse safely confined whilst the intravenous anaesthetic induction drugs

are given. Once anaesthetised an endotracheal tube is placed in the horse's windpipe to ensure a clear airway and allow administration of oxygen and the gases which will maintain anaesthesia during surgery. Hobbles are placed on all four limbs and a crane is used to carefully lift the horse on to the surgery table.

During surgery intravenous fluids are given and the anaesthetist closely monitors anaesthetic depth, heart rate and rhythm (using an ECG), arterial blood pressure, breathing rate and depth, expired carbon dioxide and also the level of oxygen and carbon dioxide in the blood. This allows any minor abnormalities to be detected early and the appropriate action to be taken to prevent any problems during surgery or in recovery. Quite often horses fail to breathe well under anaesthesia and so mechanical ventilation may be used to ensure that excess carbon dioxide is expelled and the horse is well oxygenated.

When the surgery is completed anaesthetic gases are withdrawn and the horse is taken back to a padded recovery room. When the patient is able to breathe adequately without assistance he/she is allowed to recover in a quiet environment without interference. The horse is constantly monitored during this period via closed circuit cameras. For certain high risk cases (e.g. major fracture repairs) a system of ropes and pulleys attached to the head collar and tail can be used to assist recovery if necessary.



Once standing again, the horse is allowed 20-30 minutes to find its feet and is then taken back to its hospital stall. After about an hour access to hay is allowed.

**The vast majority of general anaesthetics proceed uneventfully, but due to their size and physiology, horses are more prone to anaesthetic related problems than other animals or people and so great care is always taken to ensure the best possible outcome for the horse.**

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# Exercise Induced Pulmonary Haemorrhage

smaller airways to become evident in the trachea. When it is not possible to perform an endoscopic examination shortly after exercise, sampling of fluid from the lower airways (bronchoalveolar lavage – “lung wash”) is very useful to identify evidence of bleeding as well as indicators of lower airway inflammation or other disease.



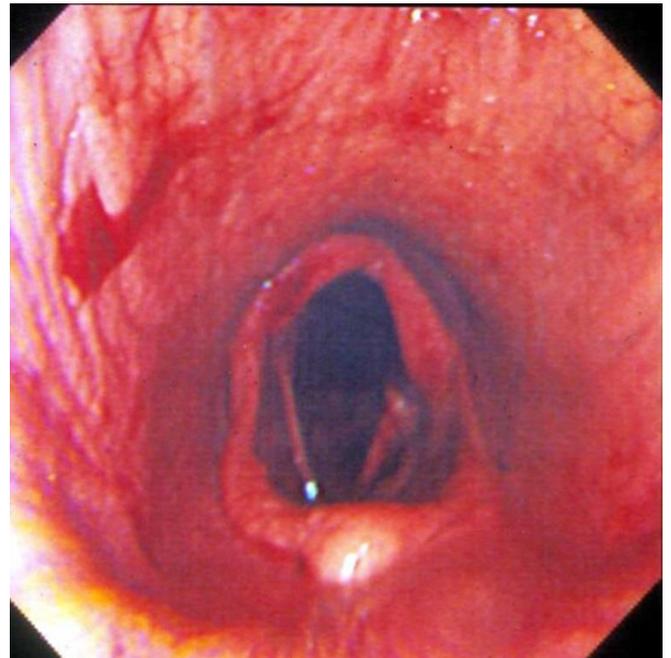
Exercise-induced pulmonary haemorrhage (EIPH – bleeding from the lungs) is a very common condition in all horses that compete at high speed. The degree of bleeding varies widely, from relatively little which can only be identified by endoscopy of the airways after fast exercise, to blood being obvious at the nostrils, and in extreme examples it can be so severe that horse can bleed to death.

## Why does EIPH occur?

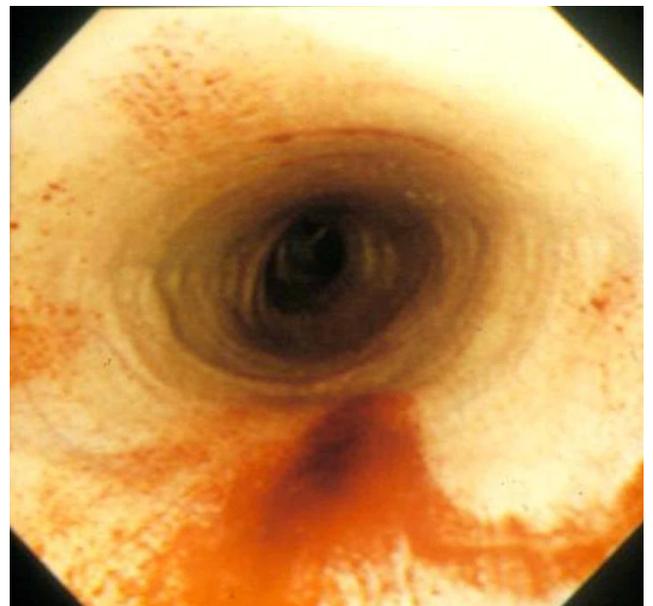
During high speed exercise the horse's muscles have a very high demand for oxygen. To service this demand the heart must pump huge volumes of blood around the body at very high pressures. This dramatic pressure increase causes rupture of delicate capillaries within the lungs which then leads to blood entering the airways.

## How is EIPH identified?

Thoroughbred racehorses are known to have the highest incidence of EIPH with up to 75% of horses having blood in the trachea (windpipe) immediately after racing. The severity is graded on a scale from 0-4. The optimum time to scope is 30-120 minutes after exercise, to allow sufficient time for blood in



*Endoscopic image of the larynx of a horse that has experienced EIPH*



*Endoscopic image of the trachea of a horse that has experienced EIPH*

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## What are the consequences of EIPH?

The majority of horses with lesser degrees of EIPH show no outward signs. Multiple studies have failed to demonstrate a clear relationship between the presence of EIPH and racing performance; however, in severe cases, performance and more importantly welfare is undoubtedly compromised. Horses exhibiting nosebleeds are strictly regulated by authorities.

## How is EIPH managed?

Clear identification and recording of horses with airway disease or a history of bleeding is important to assist management. Airway health is pivotal in the prevention of EIPH and management is targeted to optimise the stable environment. Individual stalls have different air quality depending on factors such as position within the barn, ventilation features and bedding type. Housing horses affected by airway disease in the stalls with highest air quality is beneficial and regular paddock access can also be very helpful.

Any underlying conditions such as inflammatory airway disease or respiratory infections should be addressed. Your veterinarian will be able to offer advice on the most appropriate options which may include:

**Airway dilators** – these drugs increase airway diameter and maximise mucus clearance from the airways. Clenbuterol is commonly used and is usually given orally. Other drugs are administered by inhalation using a nebuliser or nasal delivery device. This is more time consuming, but can be very useful and in some circumstances can be given closer to competition.

**Corticosteroids**- have an anti-inflammatory effect and can be administered by inhalation, orally or by injection. Side-effects can include laminitis and predisposing the patient to infection.

**Antibiotics**- may be recommended in individual cases where respiratory infection is present and can be combined with drugs to aid in breakdown of airway mucus or airway

dilators. Judicious use is important to minimise side effects such as colitis (severe, potentially life threatening diarrhoea) and development of antibiotic resistance.

Options to directly prevent EIPH are limited, but include:

**Furosemide - An injectable diuretic drug which** lowers circulating blood volume by increasing urination, which in turn reduces the pressure in the lung capillaries. There is increasing evidence that frusemide is an effective intervention in the control of EIPH. **There are restrictions on use close to competition which should be discussed with your veterinarian.**

**Nasal Dilator Strips**- Function to maintain nasal cavity opening which is suggested to improve airway mechanics. There has been evidence that the use of nasal dilator strips can reduce the number of blood cells found in the airways when compared to horses not wearing them. Permission for use varies between disciplines and regulatory bodies.



**In summary, EIPH is a very common but complex disease which requires careful management of predisposing factors to minimise its effect on performance and horse welfare.**

# IRAP Joint Therapy

Interleukin-1 receptor antagonist protein (IRAP) therapy is a joint treatment that involves processing a horse's own blood to produce a natural anti-inflammatory product that can be injected directly into an inflamed or arthritic joint. Interleukin-1 is a potent inflammatory chemical that is produced in joint disease that results in destruction of healthy articular cartilage. IRAP blocks the action of interleukin-1, which leads to a reduction in joint inflammation and can aid in cartilage regeneration.

IRAP therapy involves collecting a small amount of blood from the horse in a specially designed syringe and then incubating it for 24hrs to allow the horse's own white cells to produce increased amounts of IRAP. The sample is then spun in a centrifuge to allow harvesting of the IRAP rich fluid portion which can then be injected directly into the affected joints. Each blood collection usually yields around 6 joint treatments, with extra doses being stored in a freezer for later use. Typical treatment protocols involve weekly injections into the affected joint for a total of 3 treatments. Further treatment can be timed around competition or used if symptoms recur.

IRAP has several advantages over other joint medications such as corticosteroids. Firstly it is a natural product and as such does not have the adverse effects on cartilage health that some cortisone products can have. Nor does it have any systemic side-effects that large amount of cortisone can have. It targets one of the most inflammatory and destructive chemical produced in osteoarthritis directly and can be used close to racing or competition as it does not have a withdrawal period for swabbing.



*IRAP being injected into a fetlock joint*

## REC NEWS

REC would like to introduce Dr Jonathan Lee who is joining us as our newest intern. Jonathan is a graduate of the University of Adelaide School of Veterinary Science. Jonathan has a passion for the racing thoroughbred and is very excited to join our team in 2016.



We would like to also wish Dr Jemma Hayman all the very best for the future as she leaves REC to return to her home state of Western Australia. Jemma will be joining the staff at Murdoch University Equine Veterinary Hospital as an in-house clinician. Jemma was a wonderful addition to our hospital and will certainly be missed.