



## Pain mitigation and welfare

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In any species the presence of pain is a welfare issue. The prevention, recognition and treatment of pain in horses involves ethical, welfare and medical knowledge. Most horses will experience acute and / or chronic pain during their lifetime. Examples of acute pain include wounds, post-operative pain (e.g., after castration), and "colic." Examples of chronic (also referred to as maladaptive) pain include laminitis, tendon injuries and musculoskeletal diseases such as osteoarthritis. However it should be noted that there is a "continuum" where acute pain can evolve into chronic pain and some diseases may start as acute but become recurring and affect the horse long term; one example is laminitis.

By the very nature of what we expect from horses, ranging from gentle pleasure riding to participation in racing events or carrying heavy loads over long distances, it should be expected that injury resulting in pain is an occupational hazard.<sup>1</sup> Webster stated that it may be morally acceptable to expose horses to the risk of injury through racing, but not to ignore the painful outcome of such injury.<sup>2</sup> Alleviation of pain is a welfare issue and we have an obligation to treat animals in our care as we do not want them to suffer. However treating pain is also good medicine. Pain has wide-reaching negative effects including but not limited to promoting ileus with serious outcomes (e.g., impaction), immunosuppression, delayed healing, defensive behaviors which make nursing care difficult and handling dangerous, catabolism, weight loss and adverse cardiovascular effects (e.g., tachycardia and hypertension).

It is important to anticipate pain because preventive measures are beneficial; for example administering analgesics before, during and after surgery which is referred to as preventive analgesia. We have a wide variety of analgesic drugs and techniques at our disposal to treat pain in horses, but just using these does not mean they have alleviated pain in an individual patient. To claim that pain has been treated effectively, it must be measurable. If we ask, "what is the unit of pain?" the answer is "there is none." Recognition, assessment or measurement of pain is important as horses are unable to self-report. Recognition and assessment of pain is based on understanding normal equine behaviour and documenting what changes after a painful insult or onset of disease. This is an area where great strides have been made and we now have clinically applicable pain assessment tools which all clinicians should be encouraged to use.<sup>3-5</sup>

Owners and veterinarians must be engaged in the prevention, recognition and treatment of pain in horses. Education of all stakeholders, the continued development of assessment tools and effective analgesic drugs and non-drug therapies are essential components of equine welfare.

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## When is it time to quit?

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The repetitive, cyclical nature of loads on the musculoskeletal system associated with training for and competition in equine athletic pursuits results in a relatively high incidence of fatigue-related injuries and degenerative conditions in competition and race horses. The incidence and rate of onset of disease is related to the magnitude of load each cycle, which is determined by the speed and nature of activity, together with intrinsic (animal-related) and extrinsic (environment-related) factors. The ability to tolerate training and competition with minimal damage to musculoskeletal tissues does, in part, appear to be animal-dependent although the mechanisms behind such variation is not yet understood.

Common examples of repetitive stress injuries (RSI) in the racehorse include stress fractures and disease of subchondral bone and whole joints. There is some evidence that injuries to the superficial digital flexor tendon are also a manifestation of RSI.

The consequences of RSI are accumulative and there is often a point where associated pathology becomes irreversible. Furthermore, focal pathology associated with RSI of the skeleton is a significant risk factor for more serious injuries, such as complete fracture of long bones.

Anti-inflammatory and analgesic drugs are regularly used to manage the impact of RSIs in sports horses. While this may be reasonable practice there is a danger that on occasions it masks the severity of underlying pathology, thereby increasing the risk that disease progresses to a state where it becomes irreversible or where pathology that risks acute, catastrophic injury goes undetected.

Clinicians have a responsibility to act as guardians of the horse. They should understand the pathobiology behind musculoskeletal disease that is common in competition horses, appreciate the significance of administering medications that mask the severity of disease and be prepared to acknowledge when risk of continuing training, under the influence of medication, is against the best interests of the horse.

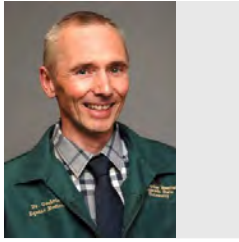
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## Biosecurity in Equestrian Activities

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Equestrian events, gatherings or activities come with an inherent risk of contagious disease introduction and its subsequent spread. Risk comes with any form of mixing and mingling, while risk increases with event size, grounds and set-up, event duration, and stocking densities. There is an increased risk of transmission during events with a focus on young stock because of an immunologically naïve population, and last, but not least, there is a human factor to consider on either side of an event: organizers and participants. Biosecurity measures reduce the risk of introduction and spread of contagious organisms. Biosecurity aims to prevent any direct or indirect contact between horses coming from different backgrounds. Biosecurity regulates static components like building structures, the set-up and size of boxes and aisles, ventilation, the number of wash stalls and outdoor paddocks, cleaning & disinfection protocols, quarantine space, but it also regulates dynamic aspects of an event: movement of horses on the premises, strategic occupation of barn space, but also humans: participants (riders, grooms, supporters with access to horses and facilities), the organizers and primary and secondary personnel. Biosecurity can only be of success if the static components fulfill the requirements and if there is broad compliance and adherence to protocols and procedures by the human component. Breaches most likely will occur on the dynamic side when there is low to moderate compliance only due to a lack of information, lack of planning, distraction, detachment, indifference, panic.

Biosecurity relies on early detection of a suspicious animal, and entry to the showgrounds is a very important filter station in the prevention of disease introduction, but it is not the first. Horses to be admitted should travel with a current health certificate and up-to-date mandatory vaccinations. Sick animals should not travel - should not attend an event. Horses should not travel from premises with undiagnosed cases of acute cough, diarrhea, ataxia/recumbency, or abortion unless tested appropriately (and in seclusion) for relevant contagious diseases. A check-in exam should be a routine part of admittance in case there is stabling in a shared barn environment. This exam should include, but is not limited to findings like abnormal rectal temperature, nasal discharge, coughing, mandibular lymph nodes, diarrhea, unexplained sudden ataxia/recumbency, symmetrical limb/ventral edema, abortion, petechial hemorrhage.

Early recognition of a suspicious animal during competition is germane to spread prevention. However, this requires reporting by the participants to the event management, which on their side requires a plan of action.

Any contagious disease is of concern during an event. Many diseases spread through direct contact, albeit via fecal – oral transmission or through nose-to-nose contact. Most of them can also be transmitted via fomites. Simple measures 'no contact', 'no touching' unless barrier precautions (gloves, gowns, shoe cover) are in place, will quite effectively prevent transmission. Airborne transmission, however, is 'complicating matter', and several pathogens are capable of spread via airspace: Equine Influenza, Equid alphaherpesvirus 1/ 4 (EHV-1, -4), Strep equi spp. equi and Equine Arteritis virus (EAV). Effective containment and mitigation can only be achieved by increasing distance between horses, erecting barriers between horses, but above all, transferring a shedding animal into a separate quarantine barn. Furthermore, many of the airborne pathogens can be shed by subclinically infected animals. Any pathogen on the list can be picked up

at home and is travelling with the animals on the same transport. This highlights the importance of clinical evaluation at home, the importance of an official health certificate, and the key function of an intake exam at the event grounds which may be expanded to additional targeted testing in the (near) future. EHV-1 (and EHV-4) is exceptionally different as it is present in many horses in its latent (silent, non-replicative) form. Latent virus can be reactivated during times of transportation and stress. Reactivation is followed by replication in the respiratory tract, which will lead to shedding of infectious virus. However, several days will go by until a horse starts to shed, and this infection is likely to bypass the travel precautions and intake exam at the event grounds.

**Conclusion:** preparedness, compliance to protocols and early detection is key to outbreak prevention and mitigation.

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## Relevance of Equine Doping for Welfare

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Doping and doping control both have potential to significantly impact horse welfare in negative ways. The former is, clearly, unregulated and unlikely to ever have the horse's best interest at heart. Conversely, doping control, which is all about protecting the horse, must be balanced to achieve its objective while having minimal impact on legitimate use of effective therapeutic medicines.

Doping of horses is undertaken to alter the performance of the animal with the intention of yielding monetary or social reward for the culprit. Horses may be doped to enhance or suppress their performance, the latter where the reward from betting income exceeds that from prize money. An injured horse may be cynically administered a legitimate therapeutic agent to disguise pathology from which it is suffering, in order to circumvent regulatory checks or in an attempt to restore its normal performance. Drugs, such as furosemide, may be used to mask the use of doping agents by increasing urine output and, thereby, dilution of the illicit agent.

There are many different drugs that have been used to enhance performance over the years. Manipulation of the horses' genome to alter an animal's physique, to increase production of endogenous agents that impact metabolic processes or manipulate pain tolerance are increasingly relevant.

Performance enhancing drugs may stimulate a horse to perform beyond its natural physiological limit, increasing the risk of injury and disease in the process. The drugs themselves may cause disease through direct pharmacological effects. Use of analgesics and anti-inflammatory drugs used to mask disease or injury increase the risk of catastrophic musculoskeletal injury and are likely to exacerbate existing pathology.

Drugs used to suppress performance may have direct negative effects and may also increase the risk of an accident in competition, causing injury to the doped horse and those in close proximity

Gene doping is associated with a range of additional threats to horse welfare, especially in a totally unregulated environment. Immune responses to vectors used to transfer genetic material and to transgene expression have been documented in humans and other animals. Vector integration, predisposing to cancerous mutation, overexpression of transgenic proteins and severe side-effects have also been recorded. Furthermore, the integrity of the natural genome may be damaged if genes in germ line cells are interfered with.

The distinction between "doping" and the legitimate use of therapeutic agents to care for horse welfare can be controversial. Many racing jurisdictions are full signatories to the guidelines documented in article six of the International Agreement on Breeding, Racing and Wagering of the International Federation of Horseracing Authorities, which requires zero tolerance towards presence of prohibited substances in horses at the time of competition. However, some would argue that temporary cessation of administration of drugs such as omeprazole, in order to comply with this rule may not be in the best interests of the horse. Nevertheless, racing authorities and analytical laboratories in relevant countries go to lengths to establish realistic screening limits for therapeutic medications, which set levels of detection (screening limits) at a point that allows valid use of the medication as late as possible while ensuring that the therapeutic effect of any residual drug at the time of competition is negligible.

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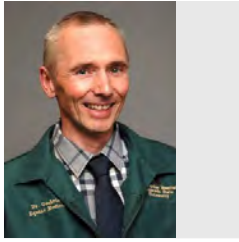
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## Outbreak Management

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The meaning of 'outbreak' is when 2 or more horses suffer from similar disease. Outbreak management tries to mitigate the progression of an outbreak, while prevention should be our goal. While outbreaks also can be caused by toxicants or deficiencies, we will focus in the following discussion on the management of outbreaks caused by infectious and transmissible pathogens. However, regardless of the outbreak's cause clinical signs in combination with environment/season (what is common in this area, region, country), and/or similar genetic background of affected needs to be taken into consideration for a diagnosis, which needs to be confirmed by specific testing.

There are no winners with outbreaks. However, the ill-prepared will suffer most... Outbreak management will differ between premises. It will depend on size, stabling type and on the organizational (management) structure of the operation. It is fact, that premises that experienced an outbreak of a contagious disease before will respond faster at an early stage to an outbreak than those without experience. 'Never again' is the phrase that drives an immediate outbreak response. Outbreak prevention and mitigation strategies should be tailored to individual premises and their needs. What helps in outbreak prevention and mitigation is simple preparedness: i) a strategic plan in place; ii) regular communication of this strategic plan with all stakeholders, ii) an emergency fund for diagnostics and mitigating adaptations; iii) routine sequestration and testing of new additions to the herd or returning horses from an event of mixing and mingling prior to joining the rest of the herd; iv) availability of (temporary) quarantine facilities; v) earliest recognition of an infected/shedding animal.

In greater detail:

- i) Procedures on paper on 'who needs to do what and when', assigning responsibilities and organizing practice rounds with mandatory presence.
- ii) Many horse owners are not willing to pay for diagnostic testing when their horse is apparently healthy. A monthly contribution to an emergency fund during '#healthy times' will allow the testing that is necessary, and funds can also be used for purchase of materials/products of transmission inhibition.
- iii) protocol of sequestration (= no direct contact, 4+ m to the next horse, ideally a separate airspace) and testing for any new addition(s) to the herd, or for returning horses from an event of mixing and mingling. I recommend 10 days for 'new additions' and 3 - 5 days for the returners.
- iv) availability of (temporary) quarantine facilities. 'Temporary' refers to the use of alternative space or temporary stable rental.
- v) 4x I of infection control

Identify a suspicious animal (fever, acute cough, nasal discharge, lymph node enlargement, petechial hemorrhage, symmetrical limb edema/ ventral edema, ataxia/recumbency, abortion, diarrhea).

Isolate/ sequester a suspicious animal immediately. During this time:  
Investigate into the cause of the abnormal presentation (initiate testing).

Inform stakeholders (internal and external) as quickly as possible if a contagious cause has been identified. Check and start testing horses in the vicinity of the affected and other in-contact horses. 'Inform' also includes quarantine for the entire operation. No horses/animals in, and horses 'off' only under specific circumstances.

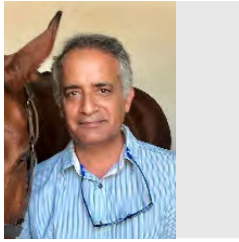
Furthermore- Implementation of procedures (see item i) for outbreak scenario: Close the affected unit for through traffic; relocate other shedding animals and create space (or barriers in case of airborne transmission) between the remainders. Mark vacated boxes as 'unavailable for use' until further notice. Implement for all animals on the farm: twice daily temperature collection; written recording & report data to management. All other horses are advised to avoid contacts with others (includes shared grooms & riders, feeding and barn crew) as much as possible. Avoid bottlenecks and traffic jams; stop activities for 72 hours (hand walking only and in an organized manner, 'as previously discussed during mock outbreak exercises'), let go of contact routines with others. Cancel farrier and routine veterinary appointments. Initiate treatments or prophylaxis if indicated or appropriate. The duration of quarantine is variable and depends on the cause of an outbreak. Negative testing prior to lifting quarantine is advised.

Conclusion: be prepared, be pro-active and follow the 4x1s.

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## Challenges for Equine Veterinary Practice in India: A Multidimensional Analysis Amidst Sporting Aspirations

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In a nation of 1.42 billion, India's equine sector, once pivotal, now faces a series of challenges. Recent statistics show a sharp 46% decline in the equine population, dwindling to just 340,000 by 2019. This decline, set against India's rapid economic ascent, underscores deeper complexities for equine veterinarians. (<https://pib.gov.in>)

Historically, the thoroughbred racing industry, with roots going back 250 years in India, was a primary patron of veterinary services. However, shifts in the political landscape, particularly the introduction of a 28% GST on betting wagers, has notably impacted this sphere. With 3500 thoroughbred racehorses and an additional 1314 mares and 70 stallions at stud, spread out across 62 stud farms and nine race tracks, many now grapple with limited access to specialist veterinary attention. (NHBSI)

Concurrently, India is witnessing a surge in equestrian sport aspirations. The past decade has seen a 65% increase in participation at national equestrian championships. Moreover, India's participation in global events like the Asian Games has spiked interest levels, resulting in the import of over 500 elite warmbloods within just a few years and a surge in investments towards breeding indigenous warmbloods.

The Equestrian Federation of India, birthed in 1967, now boasts 4,220 members, with a roster of 3,700 horses engaged in diverse sporting events, from dressage to showjumping. Polo, too, has been ascendant, with 33 registered clubs nationwide and an ever-growing spectator base. (efinf.org)

Despite this optimism, the diagnostic infrastructure, or lack thereof, remains a chronic concern. While India produces over 600 veterinary graduates yearly from its 54 registered colleges, the dearth of advanced diagnostic tools such as MRI, CT, and scintigraphy machines critically hampers their ability to offer world-class care. This situation is intensified by societal and legislative challenges that inhibit ultrasound usage, primarily due to concerns around foeticide.

Culturally, there's renewed interest in indigenous breeds like the Marwari and Kathiawari, championed by entities like the Indigenous Horse Society. However, the nuanced care these breeds require calls for more specialized veterinary knowledge.

Most alarmingly, only about 200 veterinarians are dedicated to exclusive equine practices in the vast expanse of India. The predominant number are mixed animal veterinarians, which, given the burgeoning equine sectors and sporting aspirations, amplifies the gap in specialized care. This deficit has forced many horse enthusiasts to rely on international veterinarians and farriers.

To encapsulate, the equine landscape in India is a complex tapestry of challenges and opportunities. The way forward demands rejuvenated veterinary education, amplified infrastructure investment, and fostering global collaborations. As equestrian sporting aspirations rise, there is an urgent need for India to elevate its equine veterinary sector to global standards, ensuring the health and prosperity of its revered equines in a dynamically shifting socio-economic backdrop.

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