Performance Enhancement: Opportunities for technology to unlock 'secrets' of equestrian training

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As WEG nears, the top riders in the world will be looking to solidify the horse's skillset and ensure their equine partner is fit for the demands of a major championship. To prepare for this important competition, the horse's training program will have to develop numerous factors (e.g. strength, speed, technique, flexibility, rideability, endurance, psychological) in synchrony so the horse can jump at its' best.

It is well known that there is a paucity of information regarding the training practices of show jumping horses. To date, only a few textbooks have been published on the subject, and high-quality peer-reviewed research on the topic is almost non-existent. The result of this gap in knowledge is that there is relatively little evidence to inform training practices, and how stimuli should be applied to ensure a horse peaks at the correct time is only known to the world's top trainers.

To develop an elite jumping horse, we must first understand how training influences each of the factors noted above. This is no easy feat, as the amount of available information characterizing the transfer of training to improvements in results is limited. That said, there has been some great research produced over the past twenty years providing insights into how different types of training influence these factors.

For example, researchers have proposed that sport-specific workouts develop the types of muscle fibers needed to produce and maintain high velocity movements in thoroughbred racehorses[1], and that an increased proportion of these muscle fiber types is linked to higher performance levels in both thoroughbred racehorses and show jumpers[2]. Conversely, training focusing on long duration and submaximal intensity exercise has been shown to increase the proportion of muscle fibers needed to maintain work for extended periods of time[3]. Another study examined how training influences health in show jumping horses. The authors reported that more diversity in day-to-day training, as well as riding horses on certain surfaces, was associated with a lower prevalence of injury[4]. Finally, movement is positively correlated with bone density in young horses, highlighting the benefits of time in pasture vs. extended time in a stall to ensure quality bone formation[5].

Despite the interesting insights this research has produced, one of the major limitations is that the studies are often performed over a short amount of time and in unique settings, limiting our ability to apply the findings to the training of elite level horses. Without a way to quantitatively and qualitatively assess the influence of different training methods in your stable, it is challenging to fully understand the complex interplay between all training exercises.

The Future:

Over the past few years there has been growing discussion, especially among vets and support staff, around the idea of monitoring equine athletes to access new insights regarding the health and fitness of horses. The recent release of equine exercise and wellness monitoring devices is now making

quantifying training practical and insightful. For this reason, equine activity monitors are likely to become a vital tool for many trainers and riders looking to maximize each horse's potential.

Similar to the fitness technology revolution in human athletes, horse activity monitors have the potential to unlock previously unknown training insights. This information can be used to help guide training as it provides a direct measure of how hard a horse worked on a given day, and subsequently, how they responded to that work.

For example, data delivered directly to the rider or trainer's phone can provide real-time information regarding how the horse's body is responding to work, such as:

- Is the horse finding the workout easier or harder than you expect?
- Does your perception of the horse's exercise level match what the data says?
- Is the horse losing power, balance, or regularity in strides over time?

If a horse is struggling in a workout, it may be a smart decision to end the workout or to adjust the goals – as chronic fatigue is linked to an increased risk of injury. Conversely, if a horse's heart rate is remaining low in a workout meant to be challenging, the rider has data to support making adjustments to the training plan that day.

In summary, information from activity monitors can be used to quantify and track training over days, weeks, months and even years. One of the central tenets of sports training is that all training is interconnected; what a horse did in training a month ago will impact what happens in training or competition tomorrow. To truly understand a horse and optimize training, it is important to consider the entire scope of the training program, and not just what happened over the last week. That is what technology does so well – stores and displays this data so we can quickly identify trends and patterns that help explain what does and does not work in training. With these insights, the performance level of horses will continue to increase alongside an important reduction in the prevalence of injury.

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