



Dr Sarah Randall, founding partner of Chiltern Equine, who spoke about the role of the sport horse vet

# Science behind our sport

**ANDREA HESSAY** reports from the inaugural National Sports Science Seminar, sponsored by Chiltern Equine Clinic

**H**eld in Aylesbury's Waterside Theatre, the National Sports Science Seminar, the brainchild of Kim Moloney, was opened by Jennie Loriston-Clarke OBE to an audience of more than 160 delegates, and underlined how much dressage has changed in 50 years – different horses, different quality and scope, and the total turnaround of the fortunes of British dressage.

Sports science was not on the horizon then, but horses were, perhaps, less pampered, tougher and more sound than some of their modern counterparts. Today, judging seems less partisan, and the support programmes for horses and riders are fantastic. However, the basic premise of riding the horse forward into an accepting contact, allied with a good seat and position, has not changed.

Author and instructor Hilary Vernon, the UK and European clinician for Informed Designs and an acknowledged authority on biting, has much experience and expertise in related problems and bit design.

She contends that riders and trainers should take responsibility for correct training, making informed decisions about regular dentistry, feeding, fitness and soundness before deciding on an appropriate bit for each horse.

Horses require bits that fit well and are as comfortable as possible, so that the horse is willing to work forwards into a quiet contact, and is able to recognise the signals and messages sent by the rider.

Jaw and mouth conformation is crucial to good biting decisions.

Horses have long, thick tongues that fill the mouth, with very little room left between the incisors and molars in which to fit a bit.

Higher-level dressage horses are often ridden in double bridles, and Hilary believes that such bits should be introduced relatively early, so that the actions and pressures that doubles bring to bear become familiar.

Nosebands apply pressure if fitted too tightly, and/or in the wrong place, and should be used in conjunction with the bits to teach and persuade, rather than force.

## GAIT ANALYSIS

Russell Guire, founder of Centaur Biomechanics, started performance and gait analysis in 2006, researching the effects that saddlery, bridles, rein tension, surfaces and travelling have on horses' performances. These projects, and those focusing on riders, have changed the way in which biomechanics are used within the industry.

Russell explained that horses, like humans, are naturally asymmetric. The core focus of his work is to find ways to improve the interaction between the species,

specifically with regard to equality of balance and symmetric muscle development.

The emphasis is on improving welfare and soundness, alongside increased performance, with evidence-based and research-backed science.

Such work needs the cooperation of the wider team around the horse-and-rider combination: owners, vets, farriers, coaches, physios, massage therapists, dentists, saddlers, grooms and nutritionists.

Slow-motion videoing, using high-speed cameras, shows up gait inconsistencies. For example, the huge loading pressures involved in transitions into and out of pirouettes, piaffe and passage are not always observed by the human eye. Camera work helps us to understand what is involved, and can lead to informed improvements in training, performance and welfare.

## BALANCE AND FREEDOM

Master saddler Mark Fisher works with Russell Guire on projects looking at the fit of saddles and girths in relation to mechanical locomotion.

He explained that saddle fitting is about balance and comfort, allied to freedom of movement. Saddle fitting for amateur riders tends to be defensive, with some leeway for comfort and protection of horse and rider.

For professionals, the fitting is more closely controlled for optimum balance. If the saddle is too low or too high at the front and/or the rear, or too narrow or too wide, this balance will be compromised. »

“The combined weight of rider and tack should ideally be a maximum of 10% of the horse's weight” MARK FISHER

The 'platform' should be as level and as stable as possible.

Rider age, stage and weight are assessed, in conjunction with the age, stage, fitness and condition of the horse. The combined weight of rider and tack should ideally be a maximum of 10% of the horse's weight, with 15% acceptable and 20% very close to unacceptable.

Mark uses the Pliance mapping system to gauge saddle fit via a sensor mat on the horse's back, which sends information to the computer as the horse is ridden.

High- and low-speed cameras record the information so that a comprehensive analysis can be made.

### POOR PERFORMANCE AND PAIN

Dr Ruth Sanders MVB MRCVS, from Chiltern Equine, spoke about poor performance as a result of neck, back and pelvic pain.

Only about 1% of general referrals are concerned with these areas; in performance horses, the percentage rises to around 30%.

Presenting symptoms range from 'he doesn't feel quite right', through to obvious stiffness, with a corresponding reduction in suppleness and willingness to work, to outright lameness.

The various imaging diagnostics include radiotherapy, ultrasound, scintigraphy, thermography and MRI scanning. However, voluntary and induced palpation, active and passive flexion mobilisation, lungeing and riding on soft and hard surfaces, gait asymmetry, calculated from forward, sideways and backward movements, and a comprehensive history from the rider help with initial diagnosis.

Some degree of osteoarthritis is often present, and imaging techniques can narrow down the affected areas.

It is not curable, but can be managed with targeted medications such as steroids, anti-inflammatories, laser treatment, stem cell therapy (ACS/IRAP) and, increasingly, plasma treatment (platelet-rich plasma), the latter two of which are increasingly central to effective veterinary solutions.

Nuchal ligament injuries have, in the acute phase, a good prognosis; the chronic condition less so, as it is an insidious process and not always recognised for what it is.

Back problems, such as pelvic injury, thoracic/lumbar pain and kissing spines, present with a multitude of symptoms and secondary pain sites. Imaging techniques are essential to correct diagnosis, along with diagnostic analgesia, before invasive surgery is contemplated.

## KEY POINTS

- ◆ Good biting is about common sense and informed decisions.
- ◆ Natural asymmetry in horse and rider needs to be addressed for equality of muscle development and balance, to improve soundness and increased performance.
- ◆ A successful combination is the result of an alliance between sports science and the team supporting the athletes.
- ◆ Saddles need to be fitted and regularly assessed for the comfort and protection of both horse and rider.
- ◆ If pain and injury are not completely resolved, compensatory movement strategies are set up by the horse; pain inhibits muscle strength and power.
- ◆ Riders' physical limitations keep horses' performances under par; correct exercising is essential for both athletes.

Post-operative physiotherapy is essential to bringing stability back to the supporting tissues and muscles, with sufficient rest for complete recuperation.

### SPORT HORSE SUPPORT TEAM

Dr Sarah Randall, founding partner of Chiltern Equine Clinic, spoke about the role of the sport horse vet. A comprehensive support team is essential to successful equine partnerships: vet/rider/trainer combinations know each other well and have in-depth knowledge of the horse.

A sport horse vet, accredited to national and international federations, needs to be totally au fait with all relevant rules and regulations, not only of veterinary procedures and protocols, but also of doping legislation.

Day-to-day, the horse's health considerations would include all aspects of care and management.

Sarah believes that young dressage horses are often overproduced when they are still growing and underdeveloped – building fitness and strength is time-consuming yet crucial to a sound horse.

A chartered human and equine physiotherapist, Christine Hopley has many years of experience in the assessment, treatment and rehabilitation of equines, with recognition of how horses adapt to pain an important aspect.

Acute trauma is relatively easy to diagnose and treat; chronic pain often comes from the former not being quite resolved. If pain is still evident, the horse sets up compensatory movement strategies. Pain inhibits muscle strength and power. Presenting issues include the horse being 'naughty', napping, poor performance, muscle wastage, gait unevenness, coordination and balance issues, or simply being 'not quite right'.

Micro-trauma of fibres, muscles, tendons, ligaments, bones and tissue lead to

macro-trauma if not identified and treated. A loss of tissue mass, muscle degeneration and joint stiffness are all the result of enforced rest, and need to be rebuilt over time, so training postures and techniques will probably have to be re-established.

Christine advocates rehabilitation work in hand, on the lunge, over poles and on long reins. Horses need to learn to carry themselves and gain their own balance.

"Champions don't become so when they win, but in the hours, weeks, months and years spent in preparation. The victory is merely the demonstration of their journey."

Andy Thomas is Team GB's human physiotherapist, with considerable experience at elite athlete level, and particular clinical interests in prevention and management of sports injuries. Identifying and addressing asymmetry in riders and its effect on horses is a major part of his remit.

When can remedial work be started? Preferably before the growth spurt of the early teenage years upsets the balance and strength of the rider's body. Exercises include lunges, squats, thoracic rotations, and pelvic tilts on the edge of a chair, forwards, neutral and backwards, with an upright upper body and engaged core muscles.

For athletes to maintain fitness and flexibility, exercise needs to be simple: nothing complicated, expensive or requiring extensive equipment.

At the end of this fascinating seminar, Jennie commented: "In my day we had none of this science and research available – is it really necessary?" Sarah's response summed up the day very well: "Yes, if you want to win gold!"

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