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Some Thoughts on Conditioning Dressage Horses

From playful foals to interval training, the latest science on developing sound and happy equine athletes

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The most important fitness requirement for dressage horses is strength. If you look up a definition of strength, it includes wording indicating *the capacity for exertion or endurance* but also *the power to resist force*. Dressage horses require both of these types of strength in different locomotor tissues.

NATURE'S CONDITIONING PROGRAM: *Foals' natural play behavior is the best way to build strong bones and soft tissues during the crucial early years of life*

The muscles are the motors that drive locomotion. Muscular contractions generate propulsion, support engagement, elevate the forehand, and maintain a rounded posture of the neck and back. The type of muscular strength required for dressage is different than the explosive power required for jumping; instead, dressage horses need muscular endurance so that the muscles can contract repeatedly through the duration of a test or training session without becoming fatigued.

One of the functions of the ligaments and tendons is to help the muscles to support the joints by limiting their range of motion. For example, the suspensory ligament and the digital flexor tendons support the fetlock and limit sinking of the fetlock during weight-bearing. These structures are somewhat elastic, so they stretch as the fetlock sinks and recoil as the fetlock rises. Strength allows the ligaments and tendons to resist the loading forces during weight-bearing.

A dressage horse needs muscular strength and endurance to perform the movements without becoming fatigued, which would result in deterioration in the quality of the performance and could lead to a muscular strain. Dressage horses also need to have strong ligaments and tendons to support the limbs when they are loaded. Tendon and ligament injuries are most often repetitive-strain injuries, which implies that they are the result of repetitive, relatively low-level loading rather than a single catastrophic event, such as stepping in a hole. The injury takes the form of a strain, such as suspensory ligament desmopathy (pulled suspensory) or superficial digital tendinopathy (strained tendon).

Going back to our definition of strength, muscle requires the capacity for exertion and endurance, whereas ligaments and tendons must be able to resist tensile forces. In this article, I'll discuss some management and training tips to influence the development of appropriate types of strength in a dressage horse, with the goals of maximizing performance while maintaining soundness.

Foals Need to Behave Like Foals

It has been established beyond doubt that the first two years of a horse's life are the critical time for the development of joint cartilage, ligaments, and tendons. Exercise is essential during this time period to optimize growth and development of these tissues so that they will be able to withstand the loads imposed during dressage training later in life. Beyond two years of age, these tissues have limited ability to strengthen in response to the stimulus of exercise, and they have limited ability to heal if they are injured.

The most effective way of building strong, resilient articular cartilage, ligaments, and tendons is through turnout with other foals during the early weeks and months of their lives. Foals' normal exercise and play behavior have proven superior to any structured exercise program for this purpose. Play behavior is beneficial because leaping, bucking, rearing, and play-fighting load the limbs in a diverse manner that stimulates multidirectional adaptations of the locomotor tissues.

➡ *Take-home message*: Horses that are destined for athletic careers need the opportunity to run and play as foals and yearlings in order to develop into sound, resilient athletes. Try to find out how your dressage prospect was reared before making a decision to purchase.

Start the Young Horse Slowly, and Progress Gradually

Opinions vary as to the ideal age to start a young horse. Some trainers prefer to wait until the horse is skeletally mature, at four or five years of age; others start earlier in order to be ready to compete in young-horse classes. As a rule of thumb, the earlier the horse starts work, the more slowly the workload should be increased.

Modern-day sport horses are immensely talented, and this makes it easy to forge ahead with training the technical skills. The problem is that this rapid progression may not allow sufficient time for the muscles to adapt and strengthen.

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Strong muscles help to support the joints and relieve some tension from the ligaments. Without appropriate muscular strength to share the load, stress on the suspensory ligaments and flexor tendons increases, setting the stage for a possible future repetitive-strain injury. It is the trainer's responsibility to control the horse's rate of progress up the levels to allow time to ensure the development of adequate muscular strength and fitness for each new level of competition. Moving up the competition ladder too quickly risks activating an injury that may plague the horse for the rest of his career.

➡ *Take-home message*: Athletically talented horses may learn the movements more quickly than their less-gifted peers, but they need just as long to develop strength and fitness, and this limits the overall rate of progress. Allow time for strength development at each step of the training process, and avoid the temptation to move up the levels too quickly.

Diverse Activity Benefits Young Horses

Diversification implies that an athlete is involved in a variety of sports and activities through which they acquire an array of skills, many of which apply across different sports. In training dressage horses, early diversification facilitates learning a range of motor skills and building a strong foundation.

Any benefits from early concentration on a single sport tend to be offset by the limitations in motor-skill development, a greater risk of overuse injuries, and boredom. Young horses undoubtedly benefit from early diversification, and statistics show that if horses compete in two or more disciplines before they are seven years old, they have longer competitive careers than those that participate in only one sport.

➡ *Take-home message*: Diversity in the training program benefits the young horse's physical and mental development.

Higher Levels of Competition Require Highly Sport-Specific Conditioning

Although early diversification is beneficial to a young horse's health and development, there comes a point in dressage training when specialization is necessary to develop the highly sport-specific muscular strength required. One of the reasons that it takes so long for a horse to reach the higher levels of dressage is the interdependence of technical skills and muscular strength. Muscular adaptation is specific to the joint angle and speed of contraction. It is not sufficient simply to activate a muscle; the muscle must be worked repeatedly in the same manner, as in the dressage movements. This means that the horse needs to be able to perform a movement correctly in order to strengthen the appropriate muscles. As the muscles get stronger, performance of the movement improves. ⇨

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SOMETHING COMPLETELY DIFFERENT: *Cross-training, like this treadmill session, helps to relieve horses' boredom and varies the physical workout*

A good way to develop strength for upper-level dressage is to repeat the dressage movements in an interval-training format. Interval training is a conditioning technique in which periods of intense exercise, called work phases, alternate with rest intervals that allow partial recovery and reduce the accumulation of lactic acid in the muscles. An example of interval training for dressage is to perform a set number of steps of a movement that requires muscular strength (such as half-steps or pirouette steps) as the work phase, followed by moving forward in an easier, more relaxed gait, which is the rest interval. Several repetitions of alternating work periods and rest intervals form a set, after which the horse has a longer rest, usually at the walk, before performing another set. Over time, the number of steps that form the work period is increased progressively, leading to improved endurance in the actively contracting muscles so that the horse becomes stronger in a highly sport-specific manner. For more tips on interval training for dressage, see "Intro to Interval Training" below.

One caveat: In order to improve strength in a beneficial manner, the horse must perform the movement correctly; otherwise the wrong muscles or the wrong coordination patterns are trained.

➡ *Take-home message*: Incorporating the movements of the sport into the conditioning exercises yields highly specific improvements in muscle strength and endurance.

Cross-Training Is Beneficial—but Maybe Not for the Reasons You Thought

Cross-training is a popular method of building sound, fit, all-around athletes, both human and equine. For the equine athlete, a huge benefit of cross-training is that it gets the horse out of "the sandbox" and doing something other than drilling the dressage movements. This has mental benefits in relieving boredom and also—very important—the variety reduces the risk of repetitive-strain injuries by

Intro to Interval Training

Help your horse build the strength he needs for dressage work through interval training, in which periods of work are interspersed with periods of rest.

Here's an example of dressage-specific interval training. On a 20-meter circle in collected canter, increase the degree of collection for one-quarter of each circle, and ride the remaining three-quarters of the circle in collected canter. The increased collection is the work interval, and the "regular" collected canter is the rest interval. Perform four circles; that's one set. Then allow your horse to rest for two minutes in a free walk on a long rein. Repeat the entire sequence on the opposite rein.

Practice the interval-training sequence three days a week as part of your training session. In week two, increase the number of circles from four to five in each direction; in week three, increase to six circles; and in week four, to seven circles. By the end of the fourth week, your horse should be getting stronger, and it should feel easier to maintain the very collected steps.

At this point, you could change the exercise in one of the following ways:

- Split each set: Ride four sets, each with four repetitions of the canter circles; then build up the number of repetitions in each set as before.
- Maintain the same number of repetitions, but gradually increase the amount of very collected canter until, after a few weeks, it occupies half of each circle.
- Change the pattern: Ride the very collected canter in a straight line along the long side of the arena for 10 meters, followed by a 20-meter half-circle. Repeat on the opposite long side. The distance covered in very collected canter can be increased each week, but now the horse must remain straight.

These are examples of how an interval-training exercise can be made progressively more challenging to strengthen the horse. You can devise your own variations to address weaknesses in your horse's performance.

What distinguishes strengthening exercises from regular training exercises is the adherence to performing a set number of repetitions and the regular increases in the distance or intensity of the work periods. Always pay attention to the quality of the work. If the horse becomes fatigued, cool down carefully and, if necessary, cut back on the work periods for a few workouts.

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imposing different loading patterns on the limbs. Therefore, cross-training falls under the category of diversity rather than specificity.

Cross-training can take many forms, depending on the availability of equipment and facilities and on the rider's preferences. It might include hacking, hill work, galloping, jumping, swimming, underwater treadmill, cold-water spa, or working equitation; it just needs to be something different from schooling in an arena. We should realize, however, that cross-training does not specifically enhance dressage performance; rather, its value lies in preserving soundness and preventing boredom.

➡ *Take-home message*: Cross-training is a valuable addition to a dressage training program as a means of preserving orthopedic health, but it is not the key to elite performance; this requires highly sport-specific training.

A Delicate Balance

Through the use of physiological conditioning, we aim to improve the horse's performance by increasing his strength, power, stamina, and brilliance. Our efforts to improve performance are, however, tempered by the need to build and maintain a resilient musculoskeletal support system that can withstand the rigors of training and competing. There is a delicate balance between doing enough work to stimulate strengthening and doing too much, which has a damaging effect. When in doubt, err on the side of caution because repetitive-strain injuries are a serious risk to the horse's health and indeed to his entire career as a dressage horse. ▲

Meet the Expert

Dr. Hilary Clayton is the professor and Mary Anne McPhail Dressage Chair emerita. She was the original holder of the Mary Anne McPhail Dressage Chair in Equine Sports Medicine at Michigan State University's College of Veterinary Medicine, East Lansing, from 1997 to 2014. At the same time, she was a professor in MSU's Department of Large Animal Clinical Sciences.

A world-renowned expert on equine biomechanics and conditioning, Dr. Clayton is president of Sport Horse Science, LC, which is dedicated to translating research data into practical advice for riders, trainers, and veterinarians through lectures, articles, and private consultations. A USDF gold, silver, and bronze medalist, she is a longtime *USDF Connection* contributing editor and a past member of the US Equestrian Federation's Dressage Committee.