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Preface: Innovations In Equine Physical Therapy and Rehabilitation xiii

Melissa R. King and Elizabeth J. Davidson

Introduction to Equine Physical Therapy and Rehabilitation 1

Catherine M. McGowan and Suzanne Cottrill

Physical therapy (physiotherapy, or PT) can be broadly defined as the restoration of movement and function and includes assessment, treatment, and rehabilitation. This review outlines the history, definition, and regulation of PT, followed by the core scientific principles of PT. Because musculoskeletal physiotherapy is the predominant subdiscipline in equine PT, encompassing poor performance, back pain syndromes, other musculoskeletal disorders, and some neuromuscular disorders, the sciences of functional biomechanics, neuromotor control, and the sensorimotor system in the spine, pelvis, and peripheral joints are reviewed. Equine PT also may involve PT assessment and treatment of riders.

Pain: Its Diagnosis and Management in the Rehabilitation of Horses 13

Jodie Dalglish and Khursheed R. Mama

This article provides a brief overview of pain physiology and its relevance to equine patients. Objective and subjective techniques for assessing pain in the horse are described in depth. Pharmacologic and interventional pain modulation treatments are discussed with a focus on the rehabilitating horse.

Physiotherapy Assessment for the Equine Athlete 31

Lesley Goff

Physiotherapy assessment of the equine athlete is carried out by qualified physiotherapists, who use a functional approach to the assessment of the horse. Observation, clinical reasoning, good palpation skills and implementation of outcome measures are skills used by these professionals in their assessment of the horse. Equine physiotherapists attempt, where possible, to use an evidence-based approach to the assessment of the equine athlete.

Core Training and Rehabilitation in Horses 49

Hilary M. Clayton

The central body axis or core is a key component in controlling body posture and providing a stable platform for limb movements and generation of locomotor forces. Persistent dysfunction of the deep stabilizing muscles seems to be common in horses indicating a need for core training exercises to restore normal function. Core training should be performed throughout the horse's athletic career to maintain a healthy back and used therapeutically when back pain is identified. This article reviews

the structure and function of the equine thoracolumbar spine with special reference to function, dysfunction, conditioning, and rehabilitation of the core musculature.

Acupuncture and Equine Rehabilitation

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Sarah le Jeune, Kimberly Henneman, and Kevin May

Acupuncture is one of the most common veterinary integrative medicine modalities. Acupuncture can greatly contribute to a rehabilitation protocol by promoting analgesia, tissue healing, and muscle strength. Acupuncture is safe, has minimal detrimental side effects, and is well tolerated by most horses.

Joint Mobilization and Manipulation for the Equine Athlete

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Kevin K. Haussler

Joint mobilization and manipulation provide important diagnostic and therapeutic approaches for addressing musculoskeletal issues in veterinary medicine. Soft tissue and joint mobilization are used to assess the quality and quantity of joint range of motion and as a primary means of treating musculoskeletal disorders. Spinal manipulation was shown to be effective for reducing pain, improving flexibility, reducing muscle tone, and improving symmetry of spinal kinematics in horses. Because of potential misuse and safety issues, joint mobilization and manipulative therapies should be provided only by specially trained veterinarians or licensed human manual therapists.

Kinesio Taping Fundamentals for the Equine Athlete

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Sybille Mollé

The Kinesio taping method was developed in Japan for use in humans in 1979. The use of complementary therapies is becoming common in equine athletes and the discovery of Kinesio taping potential brought it into the animal world. Kinesio taping can be used to treat a wide range of clinical conditions, from tendon injuries to neurologic disorders and from muscle contractures to postural insufficiencies. Its use in veterinary medicine is promising, but relies heavily on evidence-based clinical reports. Further scientific research is needed to fully understand the real effectiveness of application.

Principles and Application of Hydrotherapy for Equine Athletes

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Melissa R. King

Hydrotherapy has become a key element within equine rehabilitation protocols and is used to address range of motion, proprioception, strength, neuromotor control, pain, and inflammation. Various forms of hydrotherapy can be tailored to the individual's injury and the expected return to athletic performance. This article describes the mechanisms of action of hydrotherapies and potential use in the clinical management of equine musculoskeletal injuries.

Electrophysical Therapies for the Equine Athlete

127

Carrie Schlachter and Courtney Lewis

 Video content accompanies this article at <http://www.vetequine.theclinics.com>

A good rehabilitation program takes into account the possible causes for the injury. Once the underlying cause of the injury is determined, a veterinarian can construct an appropriate rehabilitation plan and use the available electrophysical therapies to their greatest effect. Treating the horse correctly for the type and location of injury, and the stage of rehabilitation of the tissue, helps ensure full rehabilitation success. This article discusses when and how to use the most common electrophysical therapies in horses including transcutaneous electrical nerve stimulation, neuromuscular electrical stimulation, functional electric stimulation, pulsed electromagnetic field therapy, therapeutic ultrasound, laser therapy, shockwave therapy, and vibration therapy.

Hyperbaric Oxygen Therapy in Equine Rehabilitation: Putting the Pressure on Disease

149

Dennis R. Geiser

There are several beneficial physiologic and therapeutic effects of hyperbaric oxygen therapy (HBOT). The indications list for the use of HBOT in the horse has been developed through extrapolation from a review of human indications and from anecdotal clinical experiences. Hyperbaric therapy is a safe treatment option with very few side effects when administered properly.

Controlled Exercise in Equine Rehabilitation

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Elizabeth J. Davidson

Controlled exercise is a fundamental and critical component of any rehabilitation program for the equine athlete. The ideal controlled exercise program is designed to complement the normal tissue reparative process after injury. As a general rule, the program starts with complete rest followed by stall rest and short periods of walking. Over time, the intensity of the controlled exercise is gradually and systemically increased until complete healing has occurred. A well-designed, injury-directed, controlled exercise program enhances the healing process.

Practical Rehabilitation and Physical Therapy for the General Equine Practitioner

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Andris J. Kaneps

Physical treatment and rehabilitation play major roles in recovery and maintenance of the equine athlete, and many therapeutic measures are accessible by the veterinarian in general practice. An accurate diagnosis of the condition undergoing treatment is a requirement, and measurable parameters obtained at diagnosis allows for quantification of treatment outcomes. Therapeutic modalities accessible to the general practicing veterinarian are reviewed. Mechanisms of action, indications, and treatment protocols of thermal therapy, therapeutic ultrasound, extracorporeal

shock wave, and laser are discussed. Manipulative therapies, including stretching and use of core strengthening exercises and equipment, are outlined.