

Accepted Manuscript

Equine rehabilitation: A review of trunk and hindlimb muscle activity and exercise selection

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PII: S0737-0806(17)30030-8

DOI: [10.1016/j.jevs.2017.03.003](https://doi.org/10.1016/j.jevs.2017.03.003)

Reference: YJEVS 2279

To appear in: *Journal of Equine Veterinary Science*

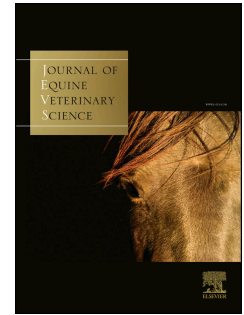
Received Date: 3 February 2017

Revised Date: 6 March 2017

Accepted Date: 8 March 2017

Please cite this article as: Tabor G, Williams J, Equine rehabilitation: A review of trunk and hindlimb muscle activity and exercise selection, *Journal of Equine Veterinary Science* (2017), doi: 10.1016/j.jevs.2017.03.003.

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1 Equine rehabilitation: A review of trunk and hindlimb muscle activity and exercise selection

2 Abstract

3 Exercise therapy is a key component in rehabilitation in both human and equine physiotherapy,
4 however in relation to the equine athlete only limited evidence is available for the use of
5 exercises in rehabilitation. The aim of this review is to analyse studies that have evaluated
6 trunk and hindlimb muscle activation and therefore provide an evidence base for the selection of
7 exercises. Isolating activity to specific muscle groups or positioning to preferentially activate
8 specific muscles is challenging for physiotherapists in horses, however surface
9 electromyography (EMG) data of muscular activity during locomotion could be applied to
10 support selection of rehabilitation exercises employed for this goal. The literature consistently
11 reports the positive effect of increasing speed and slope on activity of longissimus dorsi, gluteus
12 medius, tensor fascia latae, biceps femoris, vastus lateralis and the abdominal muscles.
13 However, there is still a lack of investigation into muscular activity during movements used for
14 rehabilitation, despite exercises using training aids, poles and stretches being reported as
15 therapeutic and strengthening. The use of EMG within the current studies does suggest relative
16 patterns of muscle activity may be useful in comparing activity of one exercise to another and
17 are worthy of further investigation in relation to rehabilitation exercise.

18

19 Keywords: horse, exercise, physiotherapy, rehabilitation, muscle, electromyography

20 1.0 Introduction

21 Exercise therapy is a key component in rehabilitation in both human and equine physiotherapy,
22 however in relation to the equine athlete only limited evidence is available for the use of
23 exercises in rehabilitation. Commonly, musculoskeletal pathologies in the horse, for instance
24 those in the hindquarters or the thoracolumbar spine, are managed post medical or surgical
25 intervention with a protocol that is based on clinical experience of the physiotherapist
26 implementing the exercises. Anecdotally certain pathologies in the horse have clinical signs of
27 local muscle wastage reported, for instance atrophy of the thoracolumbar epaxial muscles has
28 been noted in the presence of overriding dorsal spinous processes (DSP), 'kissing spines' [1]
29 and in the presences of thoracolumbar pain [2]. The presence of muscle pathology supports
30 physiotherapist involvement in equine rehabilitation regimes. Sacro-iliac joint (SIJ) region pain
31 is another example of a condition that contributes to poor performance and/or lameness in

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