

BACK PAIN

Mid-Thoracic Dysfunction: A Key Perpetuating Factor of Pain in the Locomotor System

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Dysfunction involving excessive T4-T8 kyphosis is common. Symptoms arising from regions at a distance to the mid-thoracic area are often secondary to T4-T8 dysfunction. This article will discuss why (rationale), when (indications), what (skills), and how (practical integration) T4-8 dysfunction is addressed.

Why

Mid-thoracic dysfunction involves increased kyphosis of the thoracic spine from T4-T8, usually the result of prolonged sitting in a constrained posture. Thoracic, lumbopelvic and cervicocranial posture are interrelated as links in a chain (see Figure 1). When excessive slumping becomes habitual, according to Brügger, it is called the sternosymphyseal syndrome (Lewit 1996, 1999, Liebenson et al., 1998, Liebenson 1999).

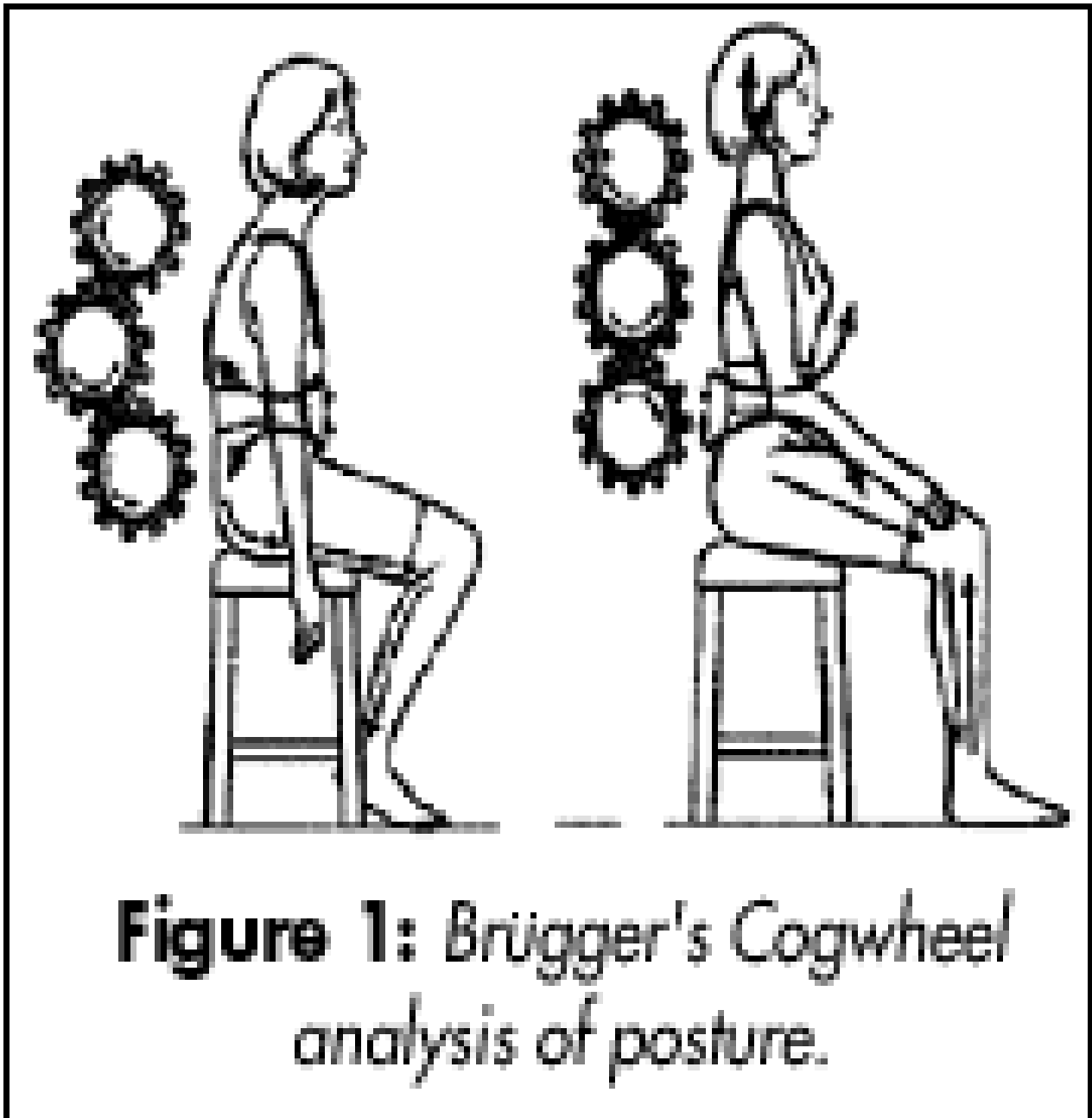


Figure 1: Brügger's Cogwheel analysis of posture.

Mid-thoracic dysfunction affects the whole body's center of alignment and posture. Head and shoulder forward posture causes orofacial, neck and shoulder disorders; slumping affects breathing by leading to inhibition of the diaphragm and overactivation of the scalenes; and lumbar disc syndromes and nerve impingement have been shown to result from repetitive end-range flexion overload (Callaghan, McGill 2001).

When

Indications for treating the mid-thoracic region arise from postural analysis, passive joint mobility testing, and active joint mobility testing. The postural sign of increased thoracolumbar hypertonus is a classic sign of overactivity of the superficial "global" muscles and indicates poor "deep" muscle function (Janda 1996, Richardson 1999, Jull 2000, Hodges 2002) (Figure 2). Palpation of passive joint mobility and quality of end-feel is best performed in the seated position, as shown by Brügger (see Figure 3) (Brügger 2000).

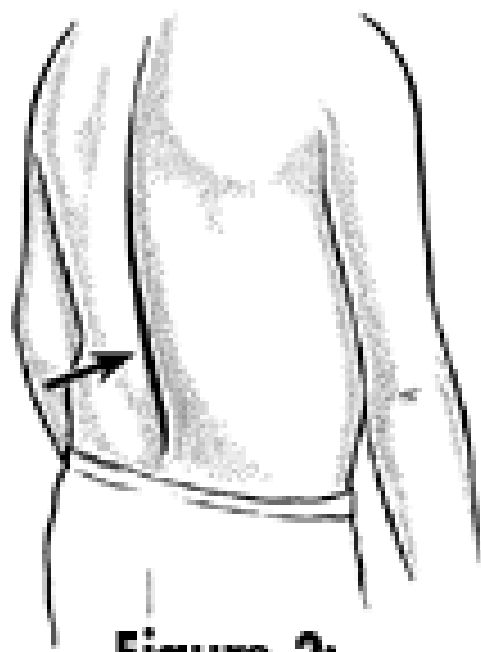


Figure 2:
Thoracolumbar hypertonus.

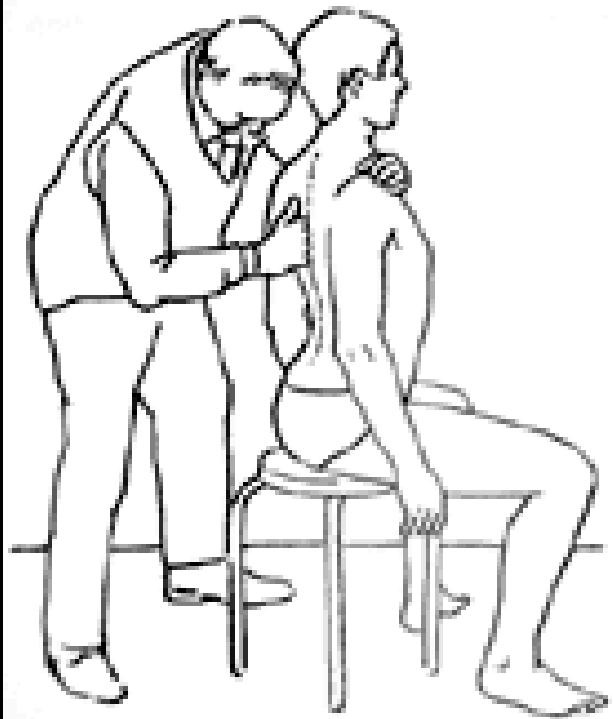
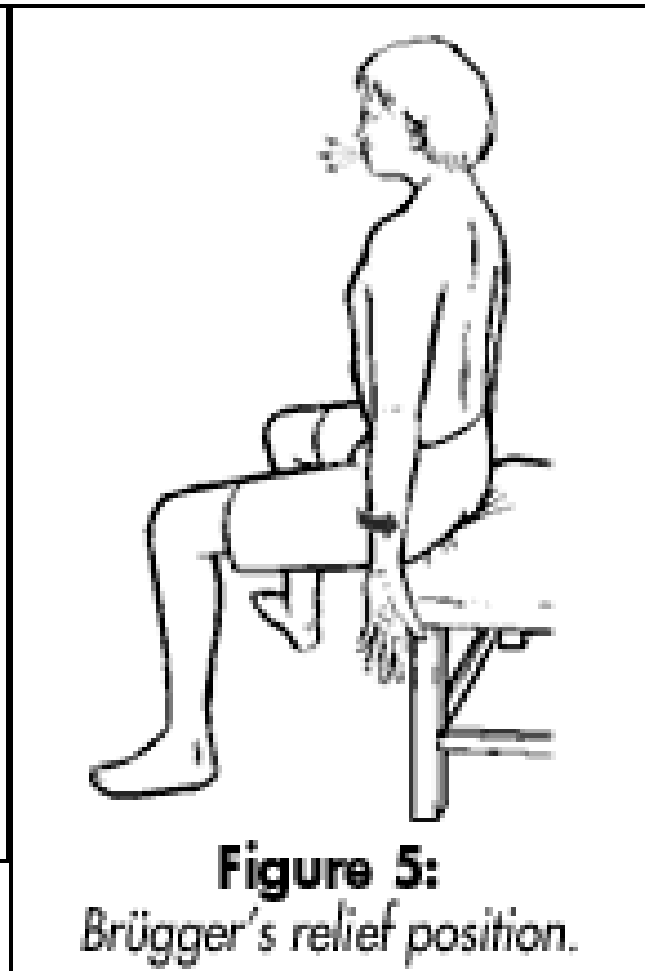
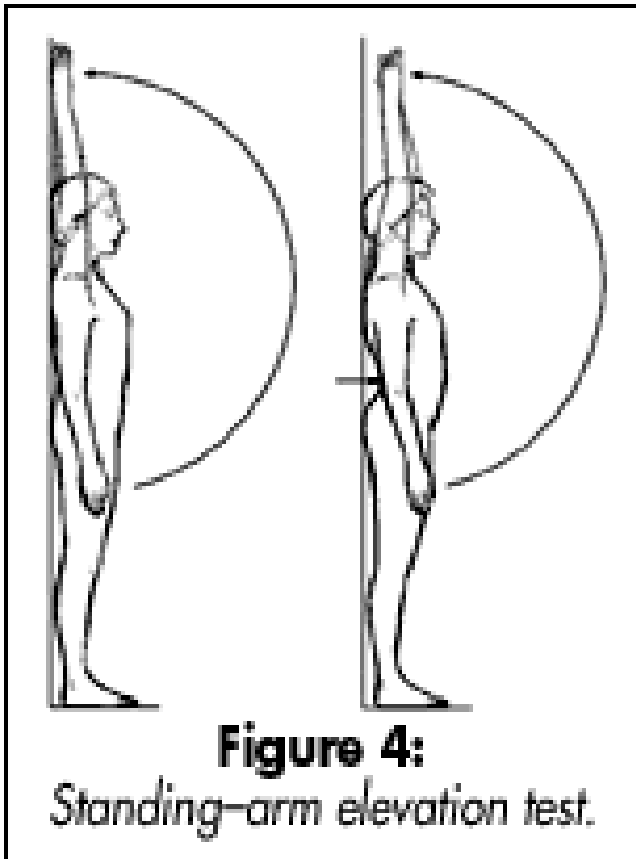


Figure 3: Bügger's
*Palpation of passive T4-8
extension mobility.*

The dynamic mobility screen of choice is the standing arm elevation test (Figure 4) (Liebenson 2001).



What

Managing T4-8 dysfunction requires a broad skill set incorporating postural advice, manual manipulation, and therapeutic exercise.

Sample Exercises for Improving T4-8 Extension Mobility (see Figures 6-7)

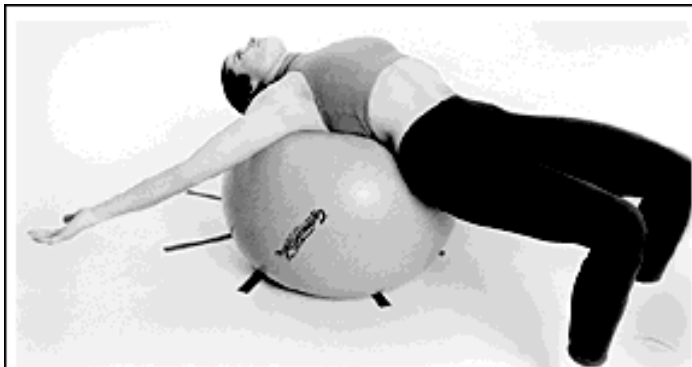


Figure 6:
Back stretch on the ball.
(Reproduced with permission from DeFranca C,
Liebenson C. *The Upper Body Book.*)

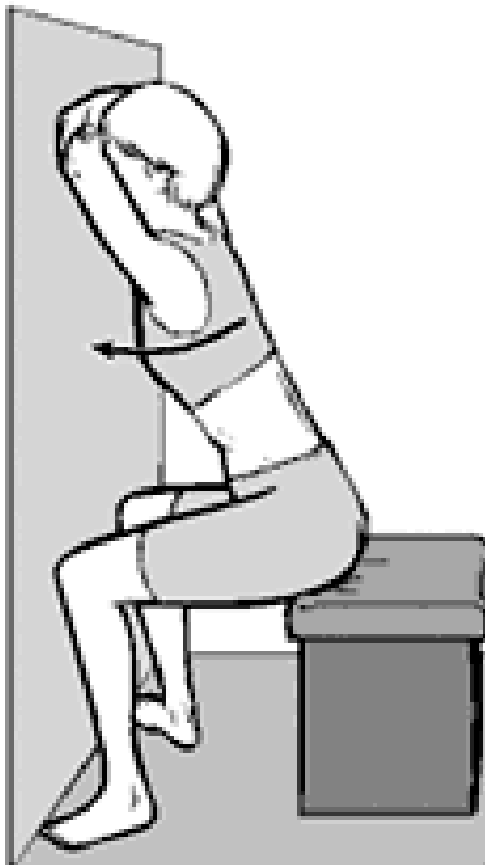


Figure 7:
*Kolár's wall slide
with arm elevation.*

- Brügger relief position - beginner
- Back stretch on the ball - intermediate
- Kolár's wall slide with arm elevation - advanced

How

Knowing why mid-thoracic dysfunction is clinically important, when it should be addressed, and what techniques are therapeutic is only the beginning point for successful management of the patient with a problem in this area. Satisfactory results will result from learning how to incorporate this knowledge and skill into patient care efficiently. A moment or two per session spent explaining the relationship between function and pain is one such step. Each exercise requires a unique "report of findings" to motivate the patient to incorporate it into his or her daily routine.

The Brügger relief position is an ideal workplace "micro-break." It activates an entire chain of muscles linked to the upright posture. To prevent the tendency to hyperextend the lumbar spine with this exercise, it should be performed with active exhalation.

The back stretch on the ball is comfortable and relaxing. It promotes improved respiration. It can cause dizziness at first, so the patient should be guided slowly onto it until he or she has learned how to balance on the ball.

Kolár's wall slide with arm elevation is a functional exercise, since it combines arm elevation, squatting and breathing. Patients typically feel a nice stretch in the *lattismus dorsi* with this exercise.

Summary

T4-8 dysfunction is a common source of muscle imbalance, trigger points, joint dysfunction, and faulty movement patterns. While often asymptomatic, it is nonetheless a key source of biomechanical overload involving the neck, TMJ, shoulder, arm, and even low back regions. Treatments which aim only at the site of symptoms are bound to fail if function is disturbed due to excessive kyphosis in the mid-back.

Rehabilitation of the upright posture is fundamental to optimization of function in the locomotor system. Neurological programs for maintenance of the upright posture are "hard-wired" into the central nervous system, making rehabilitation of the mid-thoracic area of central importance, both biomechanically and neurophysiologically. The mid-thoracic region is "linked" to a multitude of common musculoskeletal pain syndromes, and the simple assessment and treatments shown here are an excellent complement to chiropractic practice.

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