The Essential Role of the Thorax in Restoring Optimal Function

Linda-Joy Lee

In everyday clinical practice, one of the challenges facing the clinician is to determine how to use the allocated time available for assessment and treatment of each patient. What are the relevant impairments and how do they relate to the presenting symptoms? When looking at integrated whole body function, multiple articular, neuromyofascial, and control dysfunctions can often be identified. Which ones should be addressed? How relevant are painfree impairments?

Although the prevalence of thoracic pain is considered to be much lower than low back or neck pain, many clinicians recognize that the thorax is an important area to assess and treat, not only in patients with thoracic pain and dysfunction, but also in patients with lumbopelvic and cervical pain (McConnell 2005, Lee 2004, Butler 1994). The thorax is an important region of force transmission in the body, transferring loads between the legs and lumbopelvic region, and the arms, neck and head (Singer and Edmondston 2000). It is also a central area of myofascial connections; a large number of muscles that control the head, neck, shoulder girdle, and lumbopelvic region have their origins in the thorax. Furthermore, the thorax functions as a protective unit for the heart and lungs and facilitates optimal respiratory function, as well as being closely related to the autonomic nervous system. Thus, on multiple levels and via various systems, dysfunction in the thorax has the potential to impact pain and function of several other regions of the body.

It is a commonly held view that the thorax is *inherently stable* and *inherently stiff* due to the presence of the ribcage. While it is true that the presence of the ribcage affords more passive stability to the thoracic spine than the neighbouring cervical and lumbar regions, the ribcage itself is not a solid block of bones. A typical thoracic segment, which we (Lee & Lee) define as the “thoracic ring”, has 13 articulations per ring, and in total the thorax contains 136 joints. Each of these joints has the capacity to move in multiple planes, and where there is movement, there are requirements for motion control. The thorax is the centre for rotation of the trunk, essential for the production, modulation, and transmission of rotational torques. Thus, rotational control in the thorax is critical for optimal function. Consider many activities of daily living, and sports activities such as throwing, kicking, and running – they require not only control of inter-regional rotational control between the thorax and pelvis, but also intersegmental control of rotation *within the thorax*.

This presentation will review a system-based classification for failed load transfer (Lee & Lee 2004-2007) and discuss how this classification applies to the thorax as a model for clinical reasoning and hypothesis formation. Anatomical, neuromotor, and clinical evidence will be presented to highlight the role of the thorax in any task requiring rotational control and mobility. Specific case examples will illustrate how dysfunction in the thorax, with or without pain, can impact pain and function in other regions of the body, such as the neck, shoulder, and lumbopelvis. Clinical tests and the reasoning process around these tests will be presented to help the clinician determine when the thorax needs to be treated in order to restore optimum return to function, and thus facilitate efficiency in the rehabilitation process.