

LATISSIMUS: “THE SECRET PLAYER” Mike Cantrell MPT, PRC

When considering the classic posture of a patient with Left Anterior Interior Chain (L AIC) and Right Brachial Chain (R BC) influences, we know that the right shoulder is usually lower than the left, the right lateral abdominal wall is shorter in the frontal plane than the left, and there is usually an obvious left anterior rib flare. In addition, we see classics like a left side-bent head and neck and a left iliac crest higher than the right.

We know that there is a strong influence over right thoracic abduction (shortened right side lateral frontal plane) exerted by the right abdominal wall, right quadratus lumborum and concomitant weakness of left abdominal obliques. This weakness is, in part, what “allows” the left rib to begin to flare out.

There is another player in the postural restoration world that should be looked at more closely. The latissimus dorsi muscle can be a dominant force in preventing repositioning of a patient. It appears that the latissimus can act as both a frontal plane and transverse plane limiter of function. In the sagittal plane it also contributes to an increase in both lumbar lordosis and flatness of the thoracic spine.

In the frontal plane the latissimus can act as a trunk abductor. As we spend our time working to silence right side bending by working to quiet the right abdominal wall, our success may be limited if we don’t address the influence of the latissimus. Imagine the straight, downward “pull” of a fully engaged latissimus on the right side “aiding” the patient to right side bend. This right side bending then inhibits or limits the ability to left side bend. Left side bending is an element that we crucially need in order to fully reposition or begin the process of retraining.

In the transverse plane a fully engaged latissimus can reduce contralateral trunk rotation. Because of the attachment sites of the muscle (*anterior medial proximal humerus along the intertubercular groove running down to the posterior crest of the ilium, the posterior sacrum, lateral vertebral attachments from T-7 to L-5 via direct attachment and via thoraco-dorsal fascia and the posterior surface of the lower three or four ribs*) a fully engaged right latissimus can reduce trunk side bending to the left. In an effort to overcome this right latissimus engagement, the patient may begin to over engage any contralateral trunk side bending or rotating musculature. One muscle of primary importance is the left quadratus lumborum (QL). The QL will work hard to aid in left side bending and rotation if the right latissimus is dominant, but the right latissimus will win every time. The result is contralateral QL pain. Thus a classic L AIC, R BC patient who presents typically in appearance but reports a non-traditional symptom like left lower quadrant pain may have a secret player in the game that is easily overlooked.

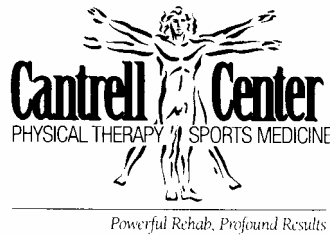


In the sagittal plane the latissimus, because of its attachment site, “pulls” the pelvis and lumbar spine forward which increases lordosis. One can easily visualize the erector spinae acting as an anterior pelvic rotator, but visualizing the latissimus rotating the pelvis forward is not as easily done. Individuals with dominant bilateral latissimus activity can and frequently do, exhibit internally rotated upper extremities bilaterally (palms facing rearward which is sometimes referred to as a positive teres major sign). Often this coincides with a more significant lumbar lordosis. Understanding that Posterior Exterior Chain (PEC) patients are superimposed over L AIC, R BC patterns illuminates the consideration that many PEC’s respond well to “typical” restorative techniques. Further, these PEC patients can still exhibit greater unilateral findings. Thus, one may ask, “are they really a PEC patient”? However, PEC or not, restoration of the pelvic floor and the neutrality of the rib cage will not happen if this sagittal influence is not considered and if the latissimus is the secret player that is not accounted for.

The latissimus also flattens the thoracic spine (sagittal plane) both **directly and indirectly**. Deepening of lumbar lordosis can result in compensatory flattening of the T-spine in individuals with heavy latissimus involvement. This is because the very muscle that is deepening the lumbar lordosis (lower latissimus) is causing **indirect** T-spine compensation in the mid back in order to maintain center of gravity in the sagittal plane. **Direct** influence on the flatness of T-spine takes place via the superior attachments of the latissimus (upper thoracic spine attachments out to the humerus). The lateral line of attachment on the spine is the **direct** cause of thoracic spine flatness, due to the angle of the latissimus pull and because of the already existing compensatory influence that the lower latissimus has exerted on lumbar lordosis.

If the right latissimus takes on the dominant role as the primary humeral internal rotator, the right subscapularis muscle would become an accessory muscle, primarily because of its disadvantaged position. When the patient attempts to internally rotate the upper extremity the latissimus begins a translatory movement into adduction or extension or both. The subscapularis is already positionally weak, due to displacement of the scapular attachment site. The scapula is forwardly tilted in a sagittal plane, as well as caudally active in the frontal plane, with a loss of medial border transverse plane stability against the rib cage. Therefore true internal rotation is mechanically challenged.

To remedy this situation is imperative and fortunately not complex. As the patient is directed to begin repositioning activities, one should ensure that the latissimus is not inhibiting thoracic scapular progress, by promoting abduction of the trunk to the left, in the frontal plane. Even if there is not a latissimus problem one should ensure that there is not any right thoracic abduction taking place, as many L AIC patients will do so without even being aware of it. Left abduction will, at the very least, allow for some quieting of the latissimus. Following successful repositioning activities, triplanar positional correction of the latissimus during integrated activity should take place.



Choosing an integrated activity for activation of appropriate musculature can be augmented via disengagement of the right latissimus in a number of ways. For example: one might choose to initiate “Left Sidelying IO/TA and Left Adductor with Right Glute Max”. When doing so, one can ensure a better outcome by having the patient place the palm of the hand flat against the abdomen with fingertips just touching the left obliques. The elbow should be forward and “in-line” with the body so that it is neither anterior nor posterior to the right side. The shoulder should be “down-shrugged” to aide in engagement of the mid and lower trapezius during the activity. Once positioned the patient should initiate an isometric contraction by pressing the flat palm against the abdomen. The patient should not allow the wrist to flex nor should the elbow travel rearward. To do so would immediately allow the latissimus to engage as a “translator” (adduction and extension of the humerus). Maintaining the correct position will allow engagement of subscapularis, while silencing the latissimus simultaneously. Any other similar PRI non-manual technique can include this modification to promote silencing of the latissimus. Full humeral glenoid internal rotation (HG IR) may occur, following this approach because of better thoracic stability and subscapularis position.

Standing activities that position the latissimus in a position to enable full inhalation and exhalation are found throughout both PRI non-manual CD’s. Silencing the latissimus in standing can be accomplished by squatting activities that call for posterior pelvic rotation and subsequent protraction of the upper extremities. PRI wall squats or un-resisted wall reaches are designed, in part, to reduce the influence of the latissimus. By ensuring thoracic flexion or back roundedness the patient is making sure that the lower latissimus direct influence on lordosis is minimized via the diaphragm, which is better positioned for spinal stability and breathing. In a good squat position, with the lumbar spine rounded adequately, coupled with the reaching activity, the intake of air forces elongation and relaxation of the latissimus and allows the diaphragm to work as the dominant inhaler and the abdominals as the primary exhalers.

Once this muscle has been integrated, it becomes necessary to ensure that it remains so. This is accomplished by increasing the level and difficulty of the exercises to the point that the patient can execute them without functional failure.