

The top 3 things

Humans are asymmetrical; the diaphragm is king and polyarticular chains of muscle control opposing sides of the body. 2017 National Conference presenter Mike Cantrell writes about Postural Restoration and the top three things he considers when treating a patient.

I was first introduced to the concepts of the Postural Restoration institute® (PRI) in 1996 when I wandered into a continuing education class in Texas that was being taught by Ron Hruska MPA, PT. That chance encounter completely changed the way I managed and viewed all of my patients from that day forward! Today, I want to provide you with a taste of this revolutionary approach to physical medicine by calling to your attention that which has held me riveted for 20 years and counting. Put simply, the PRI approach is advanced biomechanics and human kinetics that takes into account neurological referencing that includes both afferent and efferent central and peripheral nervous system processing, sympathetic and parasympathetic function, respiratory function, orthopaedic dysfunction as it relates to osteo, arthro and myokinematic action and finally, a complete understanding of human asymmetries and how compensatory management of our asymmetrical human form can lead to pain and/or loss of optimal performance and movement variability. This short article, however, is not the forum in which all of the above can be discussed. To that end, as Ron Hruska (the founder of PRI) developed the Institute, it became apparent that adequate explanation of the science required multiple classes. Today I will explore an overview of what is apparent to me and should become second nature to all who explore the science: humans are asymmetrical, the diaphragm is king and polyarticular chains of muscle control opposing sides of the body.

We should all understand that humans are asymmetrical and, more importantly, that it matters. The literature is fraught with references to human asymmetry (see attached for a brief list). Our cerebral hemispheres differ on each side with regard to many things including motor control with the left side of the brain having more control of the right side of the body compared to the opposite, which increases our ability to be right-side dominant. We also have internal organ placement that situates our liver under the right hemidiaphragm leaflet and a heart over the left hemidiaphragm. Additionally, we have three lobes of lung on the right and two on the left.

Studies show that curvatures of the spine are nearly always convex to the right. The literature points out that we are asymmetrical and this is the basis from which we can understand that one result of our asymmetry is lateralisation to the right (right side dominance if you will). Right lateralisation results in our centre of mass being more located over the right side of the body with subsequent rotation of the spine and rib cage to the left. Right hand dominance therefore is not only the result of an opposite dominant brain but the same tendency to use the right upper extremity for reaching is likely due to internal organ placement as well. Lateralisation to the right is fine when an individual is in right stance during gait but compensatory activity increases when that same individual cannot lateralise to the left!

The left and right hemidiaphragms are different and the diaphragm drives the pelvis. That concept in and of itself is revolutionary. What we know is that the left diaphragm is positioned in a state of inhalation more so than the right diaphragm. As mentioned above, this is partially (if not completely) the result of internal organ placement. A liver under the right diaphragm results in that same diaphragm being placed in a position of exhalation with concomitant inhalation on the left by comparison. Fryette's laws of arthro and osteokinematics of the spine reveals that the spine is rotating in the direction of the ribs that are externally rotating. With this in mind we can begin to understand that if the left diaphragm is in a state of inhalation (thus driving the left ribcage into external rotation), the thoracic spine in the area of the level of T-8 will be rotating to the left. Simultaneously, this left diaphragm will also increase left psoas activity, which drives the left hemipelvis into sagittal forward rotation. This is consistent with the right stance phase of the gait cycle. So, what we can draw from this short overview paragraph is that the diaphragm is responsible for a major part of gait! The diaphragm is a significant part of a group of muscles responsible for anti-gravitational positioning during the gait cycle.

Francoise Mezieres said that a muscular

chain is a set of polyarticular muscles that follow each other and overlap in the same direction with no break in continuity. Polyarticular chains of muscle are groups of muscles working synchronously to control portions of the body during movement. At the Postural Restoration Institute® (PRI), we have outlined three major polyarticular chains of muscle that exist on the left and right sides of the body. Because of the inherent asymmetries noted above, what we now understand is that these muscle groups are more active on one side of the body compared to the other. These Chains are as follows:

1. The Anterior Interior Chain (AIC)
2. The Brachial Chain (BC)
3. The Temporo-Mandibular-Cervical Chain (TMCC).

What we know about these polyarticular chains is that humans, because of these asymmetries, tend to recruit them more on one side of the body compared to the other. Hence, what we see is that most humans activate the Left AIC, the Right BC and Right TMCC more than their counterparts on the opposite side. The most important component of that last sentence is the word 'activate'. Humans 'choose' to activate. Thus we can make a considered conclusion that patient/client issues are not orthopedic. The patients' complaints may be of an orthopaedic nature but the etiology of those complaints is most certainly neurologic and pulmonary. Those same complaints can be objectively measured and likewise validated to the patient. In addition, those objective measures can be altered rapidly.

In conclusion, I ask my readers to ask themselves: Why are my patients asking me to help them with whatever their particular complaint may be? Why, for example, are they asking for help with their persistent right upper trap trigger point? Why is it continuous and unrelenting? Then consider that that trigger point is the result of something greater than a myofascial issue in and of itself. The trigger point is but a symptom. The adhesions are but a symptom. The trigger point is a tip of an iceberg of neuro/pulmonary drive and the trigger point is related to many other issues of

which the patient has been complaining for many years. Through an in-depth understanding of this material one can begin a journey into human biomechanics and objective assessment and treatment plans that can improve patient assessments and outcomes exponentially. All one must do is begin that journey – as I did those years ago when I walked into my first PRI class. The material is challenging but, if it were easy, everyone would do it!

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