

Which Comes First: The Malstructural Misalignment or the Malfunctional Muscle Imbalance?

Proverbs are informal common-sense truths about of errors that are often seen repeated. They can act as a preliminary yardstick when evaluating if a statement fits the fabric of experience.

When structure is stated as being ahead of function, common sense says, isn't that like putting the passive structural cart ahead of the active functioning horse? Formal conclusions fall into the realm of logical truths and can provide a higher level of verification.

Charles Darwin established a relevant truth when he said, "Function alters structure." The above statements would force the conclusion that malstructures, unless from injury or abnormality, would not be etiologies but signs of an underlying malfunction (even abnormalities are the sign of underlying DNA malfunctions).

A chiropractic textbook by A.E. Homewood, *The Neurodynamics of the Vertebral Subluxation*, states: "Tone is that degree of contraction shown by normal resting muscle and which maintains the attachments in proper anatomical relationship."

The statement is corroborated in numerous physiology texts. It indicates that functional tone is responsible for structural alignment, which fits well with the proverb and the logical truth. Homewood quotes D.D. Palmer: "Life is the expression of tone." That sentence is the basic principle of chiropractic. This says that normal muscle tone indicates good health, while disturbed muscle tone indicates disturbed health. Disturbed tone would also disturb structure.

Palpation encounters muscles before bones, so is it detecting subluxations or disturbed muscle tone? "Those situations which modify centripetal flow of neural impulses disturb the centrifugal flow and thereby modify the tone," said D.D. Palmer. He may not have been aware of the terms efferent and afferent, but D.D. was insightful enough to realize that disturbed feedback would disturb muscle tone, which controls structural alignment.

This would appear to be the logical place to look for a primary disturbance, since the efferent nerve signal generators are all protected inside the central nervous system, while the afferent nerve signal generators are out in the "jungle."

The quest then is to determine what factors other than injury, toxins or tumors could disturb muscle feedback. Emotions would operate efferently (generally), not afferently (specifically). When turning to textbooks for clues, one faces the fact that physiology and anatomy texts contain material tailored for use in the practice of medicine. Medicine's divide-and-conquer approach to health care, utilizes neurologists, angiologists, gastroenterologists, ophthalmologists, urologists and even proctologists, but no muologists. The muscles, which constitute more than half the mass of the body, are orphans.

The result is disconnected and sometimes contradictory information on muscle function. Even the

biochemistry books use the word "probably" when discussing muscle metabolism. This required pooling information from different sources to look for trends of information. This included two different editions of *Guyton's Physiology*. The older edition had some relevant information that had been removed in the newer edition, not because the information was obsolete, but to make room for material better tailored to medical practice.

Mountcastle's Physiology is a detailed two-volume set. This was rounded out with the physiology text by Betne and Levy. For anatomy, there was *Gray's Anatomy* (the unabridged British edition, not the U.S. version); *Grant's Anatomy*; Lockhart/Hamilton/Fyfe; the more informative cross-section anatomy text by Eyclesmyer and Schoemaker; and the texts by Han/Kim and Cahill/Orland.

It was disconcerting to discover that *Gray's Anatomy*, which is considered the premier anatomy text in the world, was a font of misinformation regarding muscles. The text is identified as *Gray's Anatomy*, not *Gray's Anatomy and Physiology*, yet they could not resist encroaching into the field of physiology with resulting error. Muscle tone is a physiological response, not an anatomical structure. *Gray's* insists that all the physiology texts are wrong when they say muscle tone is residual contraction in a normally resting muscle (a point on which physiology texts unanimously agree).

Through lack of understanding of how electromyography operates, they claim there is no residual contraction in a relaxed muscle and created the misconception of ligamentous support well inside the range of motion. Physiologists agree that ligaments only operate at the limits of the range of motion.

Gray's also meddles in discussing the different functional types of muscle. Again, function is physiology, not anatomy. *Gray's* claims there are three types of skeletal muscle fibers: slow-twitch aerobic muscle, fast-twitch anaerobic, and fast-twitch aerobic. As a result, there exist sports medicine articles extolling the existence of the fast-twitch aerobic fiber.

The physiology books agree, however, that fast-twitch aerobic fibers do not exist in primates. Humans are the top primate. Why this fiber is not needed in primates will be discussed in a future writing on the consensus on muscle metabolism.

JANUARY 2000