# Refining the Self-Image: Feldenkrais Method® and Integral Human Gait™ Theory

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As Feldenkrais practitioners, we are steeped in a method that teaches us how to facilitate a person's capacity to move easily and functionally. The Feldenkrais Method trains us to appreciate the sensitivity of the human nervous system. In Functional Integration lessons, it is the clarity of how we touch and move people's bones that leads them to experience a more complete self-image. We also know that the quality of our contact allows the brain to build new pathways toward improved options.[1] This "fleshing out" of our self-image allows the possibility to engage in all aspects of our lives fully, free from habitual and parasitic patterns of action. To deeply sense skeletal support gives us access to another perception of ourselves and of our place in the world. The expression of our unique being in the world can be most clearly observed through our gait (walking).

The first purpose of this article is to help practitioners of all levels refine their self-images, and to suggest ways they can do the same for their clients. To that end, it presents an anatomical review of trunk and pelvic skeletal handles (landmarks) and their role as levers. Knowing anatomy, knowing functional anatomy, and knowing their roles as they relate to movement patterns are three distinct—yet interdependent—bodies of knowledge.

The second purpose of this article is to help practitioners understand and explore the potency of this interdependence by using Integral Human Gait™ theory—an integration of different viewpoints that collectively provide a map of gait, including forgotten and unexplored territories associated with gait. Note that the understanding of biomechanics of functional anatomy and movement patterns presented here is explanatory only. It is not presented with the intention of correcting the practitioner or student but in the spirit of Dr. Moshe Feldenkrais himself, who said,

"To me, there is nothing correct. However, if you do something and don't know what you are doing, it's incorrect, for you. If you do know what you are doing, then whatever you do, you are correct."[2]

*"Walking is man's best medicine"*

—Hippocrates

Locomotion is an evolutionary impulse. Bipedalism, with its attendant freeing up of the forelimbs, led to the expansion and reorganization of the sensory and motor areas of our brains, areas that process sensation and control movement.[3] While the use of our hands has certainly contributed to our survival for more than three million years, the origin of walking upright remains a mystery. Survival hypotheses range from scanning the horizon for predators to reaching for food sources and carrying food over long distances.[4] Some anthropologists speculate that social factors may have been principally responsible, as food sharing was an important component of social behavior.[5] Regardless of the starting point, two-legged walking has allowed us to hunt and forage for meat, create and manipulate tools, and evolve our brains.

Most human societies have developed to the point where walking is no longer a requirement for survival. Yet in terms of activating neuroplasticity and nourishing the systems of the body, the evolutionary importance of walking remains. The science is clear: a person who cannot (or will not) walk struggles with more health issues than a person who can

(and does) walk.[6] A healthy gait feeds our joints and bones and assists our circulatory, lymphatic, and respiratory systems in the elimination of waste.[7] Walking regularly, even 10 minutes a day, helps support the optimal function of the digestive system, aiding peristalsis in the processing of food.[8]

Inefficient movement patterns and old injuries can contribute to osteoarthritis, tendonitis, bursitis, degenerative joint issues, and spinal disorders.[9] The biomechanical components of gait, particularly at the peak of standing on one leg, can impact the efficiency and quality of function of the muscular and nervous systems.[10] This can manifest itself in a person's ability to elicit the appropriate righting reactions and equilibrium responses required for adapting to ever-changing environmental conditions.

Recent studies support the impact of gait on cognitive functions as well.[11] Elderly subjects who walked for 40 minutes a day, three times a week, for one year, experienced a two-percent increase (on average) in the size of their hippocampus, the part of the brain that controls memory and emotion. Lowering blood pressure and increasing blood flow seem to be key factors, as the hippocampus size did not increase in subjects who did stretching only.[12]

For the past five years, investigators have observed the causal effects of posture on the mental experience of power, suggesting that upright posture is linked to a stronger self-image.[13] From a somatic perspective, strength might be more appropriately understood here as the *clarity* of one's self-image, or a more complete awareness of one's parts. Power-posing (certain static sitting and standing postures, held for two to three minutes) has been shown to affect the endocrine system, increasing testosterone levels and decreasing cortisol levels in both men and women.[14] This powerful combination of hormones notifies the body that it is capable of responding from a place of mental clarity, a place of options and choices, rather than from an anxious or parasitic mental state.

## INTEGRAL HUMAN GAIT™

Gait is fundamental to our lives; at the heart of the human experience is the *how* of walking. It shapes our physical comfort, our sense of security, and our emotional well-being. Beyond the usual characteristics of the stance and swing phases of gait lies a more comprehensive map that goes beyond the established findings of physical medicine, rehabilitation, and sport training—a map that charts our relationship with gravity as it fluctuates between adversarial and allegiant. The author and her colleague, Cynthia Allen, have a name for this new map; they call it Integral Human Gait™ theory.

In the development of Integral Human Gait™ theory (IHG), we look to other fields of study in order to create a more cohesive and comprehensive picture of gait. In addition to the somatic field of education, we study contributions from the fields of osteopathy, physical therapy, anthropology, human potential, biomechanics, exercise science, human kinetics, and neuroscience. Because the way we walk impacts our well-being, human evolution, and global development, IHG works in concert with the Feldenkrais Method to help people find their optimal gait.

The philosophy of integral map or model making, as observed throughout the written works of Ken Wilber, influenced the development of Integral Human Gait™ theory. Wilber pulls concepts and theories from the disparate fields of business, politics, science, and spirituality, and he integrates them with concepts and theories from the field of developmental psychology. He defines the word "integral" as "to integrate, bring together, to join, link, and embrace."[15] His findings include the observation that most models have six to

eight major developmental levels of growth, representing the way people see, interpret, and experience their world throughout the stages of childhood, early adolescence, adulthood, and late adulthood.

The developmental levels identified by Wilber are present in all facets of human growth and development (physical, emotional, mental, and spiritual). Each level is like a hidden map that people use to navigate the territories in which they live. Feldenkrais understood these hidden developmental growth maps as well, along with the impact they have on our capacity for learning. In *Embodied Wisdom*, he wrote,

> "But there is a learning in which you have no say whatsoever, and that learning is latent in the natural laws which have produced our brain and our nervous system and our body and our muscles. These laws are included in the cosmic laws of the universe. They are so precise and so sequential that you have no say about the order you will learn them in. They must be learned in that order; if not, you will not develop as a normal human being."[16]

Feldenkrais believed we cannot perform certain functions until the capacity for them has been developed. For the most part, we are unconscious of the underpinnings within and across these developmental levels and of the strong intra- and inter-functional relationships at play. According to Feldenkrais, "In the human nervous system, each part comes into function in a sequence, one after another. The functioning helps the growth at each stage as a new part of the brain comes into dominance, and changes the entire way of action. This type of learning must proceed at its own pace."[17]

Another fundamental principle of IHG theory is based on Wilber's idea to study and categorize items in terms of their nature. He uses the word "holon" (derived from the Greek word for "whole") to describe things that are simultaneously whole and part of a whole: "every entity and concept shares a dualistic role – as an autonomous, self-reliant unit (the whole) unto itself, and as part of one or more related units."[18] One example of a "holon" is the cell, which is unique as a cell and at the same time part of another whole, the organism itself. Another example is found in the traditional motor assessment of the developing infant.[19] Represented graphically (Figure 1), developmental milestones appear as concentric circles, with the higher levels both transcending and also including the lower ones.

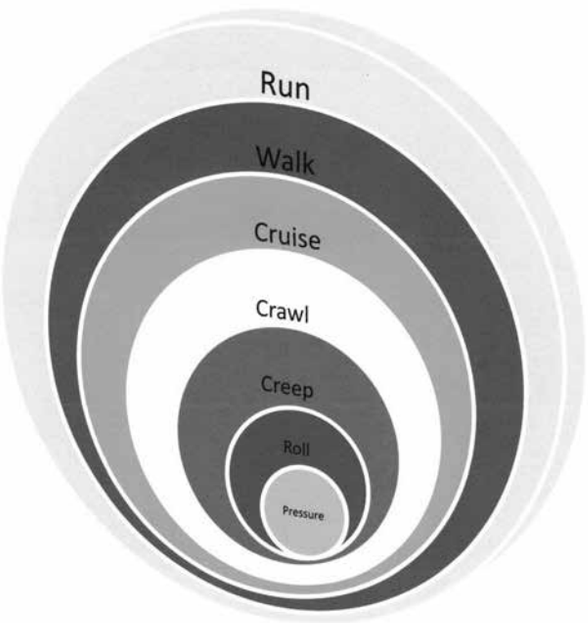



FIGURE 1 Use of the word "holon" to describe the traditional milestone/motor assessment of the developing infant.

Practitioners can often see when their students have not yet fully developed the recognition of certain movement patterns available to them. In Functional Integration lessons, practitioners invite exploration and clarity of a part that is not yet integrated or clear. The Feldenkrais Method helps students develop tools for sensing through the strategies of presence, precision, timing, and care. Gradually, increased levels of attention, concentration, kinesthetic imagination, and awareness allow students to discover and differentiate how the parts of a function relate to the whole of a person. When this perception of self is refined, the capacity for both movement and thought is grounded in choice, function, responsiveness, power, and possibility—what Feldenkrais called "mature behavior."

> "The pattern of disease or injury that affects any group of people is not a matter of chance. It is invariably the expression of stresses and strain to which they were exposed, a response to everything in their environment and behavior"
>
> —Calvin Wells[20]

As Feldenkrais practitioners, we know that Awareness Through Movement lessons improve the organization of the whole person. There are specific lessons that alter the organization of the head, the shoulder and pelvic girdles, and the ribs. In particular, the shoulder and pelvic clock lessons have a powerful impact on the central and peripheral nervous systems and on functional movement. Movements initiated during the clock lessons are examples of the term "holon," as they are simultaneously self-reliant units (shoulder/pelvic girdles influencing their respective appendicular counterparts, arm/hand, and leg/foot) and parts of something else (head and axial skeleton, protective righting and equilibrium reflexes, health and homeostasis of physical dynamic systems within the body, access to social life and place in society, and influencing community and world development).

Depending on the orientation of the clock, practitioners can see potential for the actualization of all functional movement patterns: rolling on the floor and turning when upright, reaching upward or outward, standing on one leg, sit to stand from various heights, climbing, walking, and running. Embedded in each lesson are exploratory clues that can unlock potential energy and illuminate movement patterns. The simultaneous existence of whole and part becomes clear when the clock movements are experienced through ipsilateral and contralateral planar movements. Clock lessons are most effective when performed in a variety of positions, including side-lying, supine, prone, floor-sitting, chair-sitting, and standing with hands, feet and/or knees connected to the floor, the wall, or a chair. Since the whole and part of each clock movement are experienced in all three planes (sagittal, frontal, and transverse), the changes in spatial orientation enhance the three-dimensional quality of self-image.

## FUNCTIONAL ANATOMY AND SKELETAL HANDLES

IHG theory uses the concepts of multi-planar and counter-rotational movements to restore spontaneous and functional interdependent movement patterns. There are three cardinal anatomical planes that pass through the body—sagittal (anteroposterior), frontal (coronal), and transverse (horizontal). The sagittal plane divides the body into the left and right side. The frontal plane divides the body into the front (anterior) and back (posterior) portions. And the transverse plane divides the body into the upper (superior) and lower (inferior) portions.[21] Each plane is perpendicular to the other. For movement to occur in a plane, it must rotate about an axis that has a 90-degree relationship to the plane. During activities of daily living such as reaching, walking, and exercising, movement usually occurs in more than one plane at a given joint and is therefore referred to as multi-planar. Both somatic- and medically-based rehabilitative fields recognize the benefits of moving equally well in all cardinal directions. For example, the harmonious lateral translation of the C7 vertebrae and the pelvis over a standing foot allows the other leg to effortlessly lift up off the ground and swing forward during walking. Students of the Feldenkrais Method understand that it is not just the ability to do a particular action or movement in various planes, but rather the quality of that action or movement that matters.

A way to restore or enhance quality of movement is to consciously explore the concept of counter-rotation or three-dimensional joint kinematics. There are two ways to think about counter-rotation. First, let's explore the oppositional movements that occur within

a single joint. At all joints, the motion between articular surfaces is the same, whether the distal lever moves or the proximal lever moves. However, the proximal lever and distal lever move in opposite directions to produce the same joint motion.[22] For example, consider the motion of straightening and bending the knee, known as extension and flexion, respectively. The architecture of the "distal lever," or tibia plateau, is uniquely designed to produce five degrees of external rotation during the last 20-30 degrees of knee extension.[23] The relevance of this rotation is that it "locks" the knee while standing, therefore reducing the work performed by the quadriceps muscle. From a functional anatomy perspective, the tibia rotates internally during the swing phase of gait (knee flexion) and externally during the stance phase (knee extension), while the femur, or proximal lever, moves in the opposite direction. In other words, there is femoral external rotation during knee flexion and femoral internal rotation during the last 20-30 degrees of knee extension.[24] At the ankle, the tibia now becomes the "proximal lever" and at mid-stance is still rotating internally while the "distal lever" (the subtalar joint) reaches peak pronation at mid-stance.[25]

Another way to think about and experience counter-rotation is as oppositional movements occurring with collective parts of the skeleton. The ability to counter-rotate productively is a basic requirement for the developmental movements of creeping, crawling, and walking. Counter-rotation is not new to Feldenkrais practitioners, as it is generally introduced and explored early in training programs. Supine "press-and-lift" Awareness Through Movement lessons awaken the counter-rotations necessary for these early developmental movements. The basic actions of the lessons are: press/lift one shoulder, press/lift one side of the pelvis, and press/lift the diagonal shoulder and pelvis at the same time. In all counter- or oppositional-movement patterns, the part that is moving up will have a counterpart that is moving down. Likewise, that which is moving forward has a counterpart moving backward, and that which is moving in has a counterpart moving out. In reference to the body or extremities, one might be familiar with the term contralateral, which refers to the oppositional movement of the arms and/or legs that is not necessarily analogous to (but is the effect of) counter-rotation. Multi-planar or three-dimensional counter-rotational movements of the shoulder and pelvic girdle can produce contralateral arm and leg swing.

The counter-rotational movement of the pelvis and shoulder girdle has been extensively studied in rehabilitative and movement-analysis fields, where it is referred to as trunk-pelvis coordination, or pelvis-thorax rotation.[26] The difference between IHG theory and the Feldenkrais Method (along with other fields of gait study like physical therapy, kinesiology, clinical biomechanics, and orthopedics) is the identification of a specified skeletal location in the trunk or thorax where counter-rotation of the two girdles should optimally occur. Some authors state that the motion of the trunk in opposition to the pelvis during gait is mainly due to the reverse arm swing, while others conclude that arm swing is passive, and that upper-body movement is powered by lower-body movement.[27] IHG theory, on the other hand, proposes several anatomical and functional movement patterns that address key areas of the skeletal system that may be less familiar to practitioners—areas that can facilitate multi-dimensional counter-rotations within the shoulder girdle, spine, and ribs.

To explain the three-dimensional counter-rotation of the pelvic and shoulder girdles during gait, the Feldenkrais clock lessons are offered alongside the biomechanically-based stance and swing phases of gait. First, consider the movement of the pelvis on the standing leg. As illustrated (Figure 2), the right leg is lifted and swings forward, but it has not yet started its descent back to the ground. In order for this movement to occur in the most efficient, effortless way possible, and with a neutral lumbar spine, the right side of

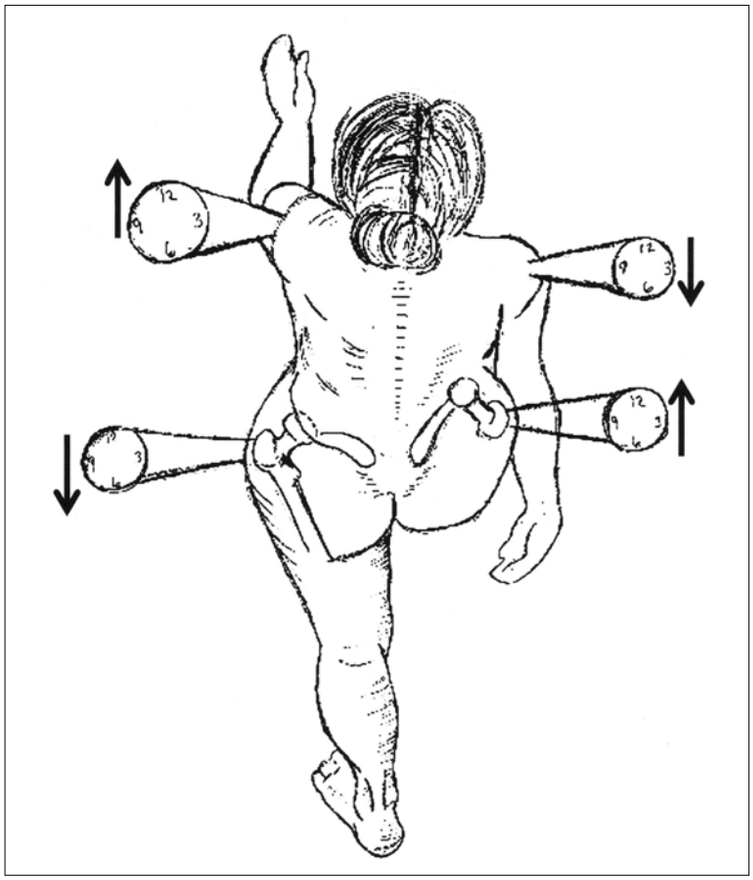


FIGURE 2. Stance and swing phase of walking. Right leg has left the ground and swings forward but has not yet started its descent to the ground. All clock images are placed on the lateral side of the body. The clock numbers are facing outward. Notice the distance between the clocks on the left is elongated. This indicates elongation of the left lateral trunk during left stance phase of walking.

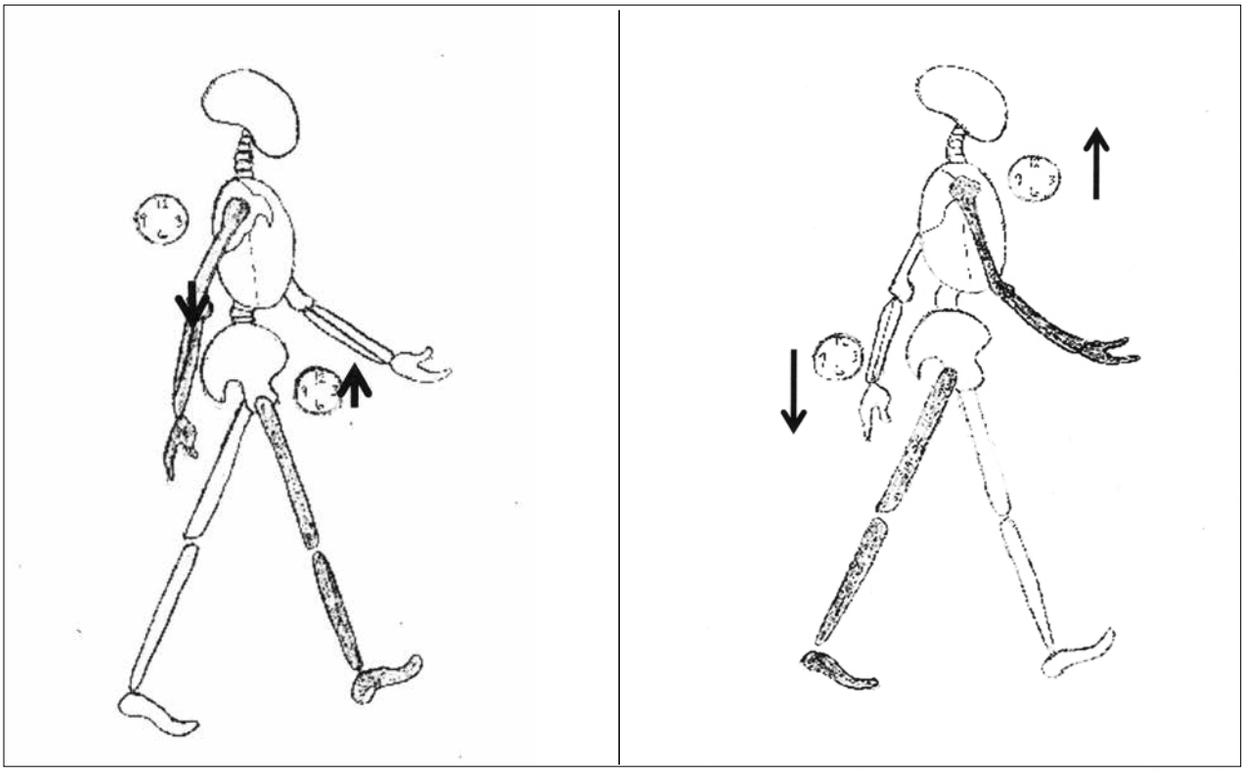
the pelvis must simultaneously translate left, tilt laterally in the frontal plane, translate anteriorly in the sagittal plane, and rotate left in the horizontal plane. Interpreting these movements using the pelvic clock image, the right side of the pelvis has moved up to the 12 o'clock position and then forward to 1, 2, and 3 o'clock positions.

Since the right side of the pelvis is connected anteriorly through the pubic symphysis and posteriorly through the sacrum, the left side of the pelvis is simultaneously rotating left in the horizontal plane and translating posteriorly in the sagittal plane. Literally, the left acetabulum, or hip socket, rotates on top of the left femoral head, or ball of the left standing leg. If a clock were placed on the left side of the pelvis and viewed outwardly, one would observe movement toward 6 o'clock, then backward to 5 and 4 o'clock. The femur on the standing leg needs to rotate internally when it starts to bear full weight. This internal rotation is dependent on the pelvis moving in three dimensions around the head of the femur, and it is a prime illustration of individual joint counter-rotation and how the pelvic clock lessons can be transferred to gait.

The concurrent counter-rotation of the shoulder girdle to the right is also illustrated in Figure 2. The shoulder girdle tilts laterally and to the right in the frontal plane. Again, viewing the clock outwardly, the right shoulder clock has moved through 6, 7, 8, and 9 o'clock, and the left shoulder clock has simultaneously moved through 12, 11, and 10 o'clock. It is the anterior translation of the left shoulder girdle (toward 10 o'clock) and the posterior translation of the right shoulder girdle (toward 9 o'clock) that is the basis for the contralateral arm swing (Figures 3-4).

FIGURE 3. Shoulder and pelvic clocks placed on the right shoulder and pelvic girdles during the later swing phase of gait. The clock numbers are facing outward. Notice the distance between the clocks is narrowed compared to Figure 4. This indicates sidebending of the right lateral trunk during swing phase of walking.

FIGURE 4. Shoulder and pelvic clocks placed on the right shoulder and pelvic girdles during the later stance phase of gait. The clock numbers are facing outward. Notice the distance between the clocks is elongated compared to Figure 3. This indicates elongation of the right lateral trunk during right stance phase of walking.



Currently, there are limited gait studies that specifically address the functional anatomy of the spine, the sternum, and the individual ribs during counter-rotation. Often these areas are referred to collectively as "thorax or trunk."[28] Instead, IHG theory proposes a dividing line between the upper and lower thoracic vertebrae and their corresponding ribs for optimal gait. The lumbar spine, the lower thoracic vertebrae (approximately T7-T12), and their corresponding ribs follow the multi-planar direction of the pelvic girdle, while the upper thoracic vertebrae (approximately T1-T6) and their corresponding ribs follow the multi-planar direction of the shoulder girdle. Gross anatomy of the axial skeleton (sternum, ribs, and vertebrae) is used to help further explain the vertebral/rib coupling of the shoulder/pelvic girdles, as follows:

> Observe the length of the sternum (Figure 5). Notice the ribs that are directly attached to the length of the sternum. Ribs 1-6 have their own individual attachments. These sternocostal (SC) junctions are joints comprised of cartilaginous discs, ligaments, joint capsules, and synovial fluid. Ribs 7-10 share an ascending conjoined attachment to the sternum via Rib 7. These ribs tend to function collectively as a group known as the right and left anterior rib angles. Closer investigation of the muscular attachments to these angles and to the ilium supports the idea of a dividing line above the lower thoracic vertebrae and their corresponding ribs.

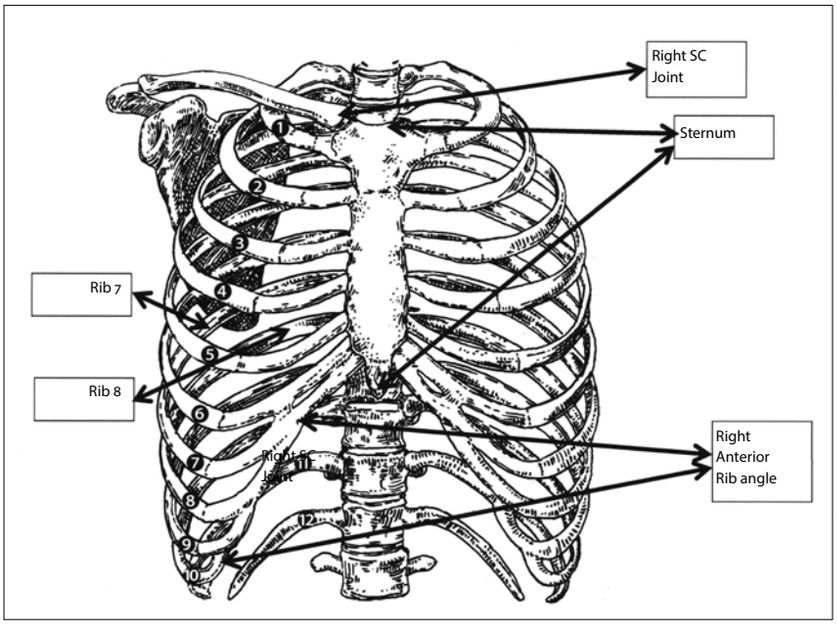



FIGURE 5. Bony framework of the thorax (anterior view). Observation of the length of the sternum, Right and left anterior rib angles and the location of the posterior and interior surface of Ribs 7 and 8 in relationship to the inferior angle of the scapula.

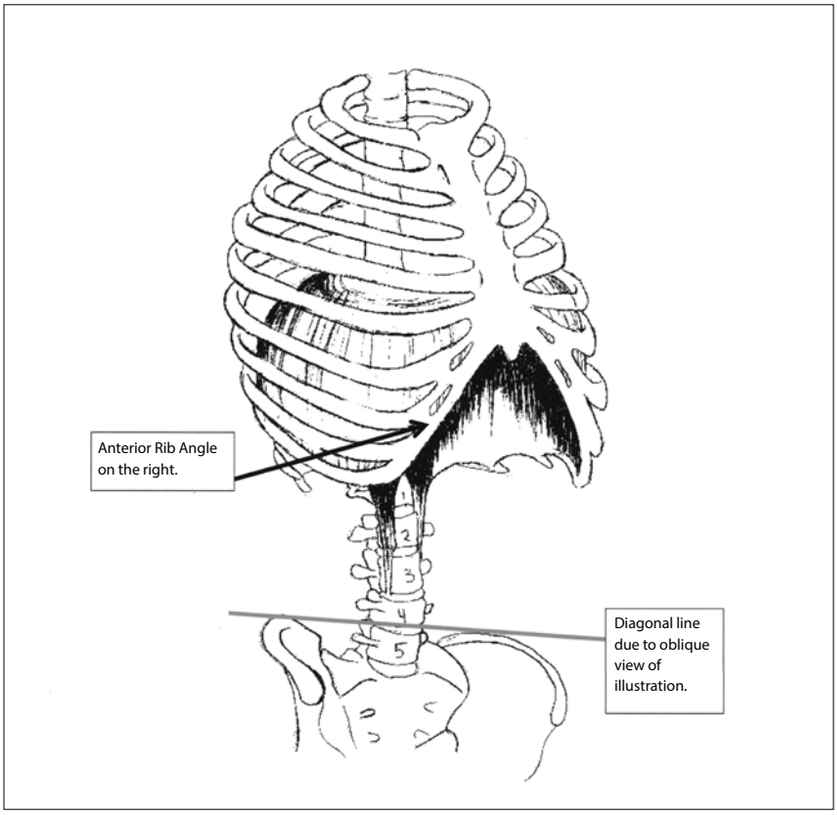



FIGURE 6. Location of Lumbar 4 and Lumbar 5 in relationship to the ilia. Attachment of the diaphragm to the anterior (interior) rib angles.

There are certain anatomical landmarks of the skeleton that are ideal to use as skeletal handles (Figure 6). When utilized appropriately, they can help bridge the gap between anatomy and functional anatomy. Practitioners can use them as levers to direct specific lines of force through a joint or joints and help their students experience biomechanics. In addition, the clarity of skeletal handles in movement can help students improve the three-dimensional quality of their self-image.

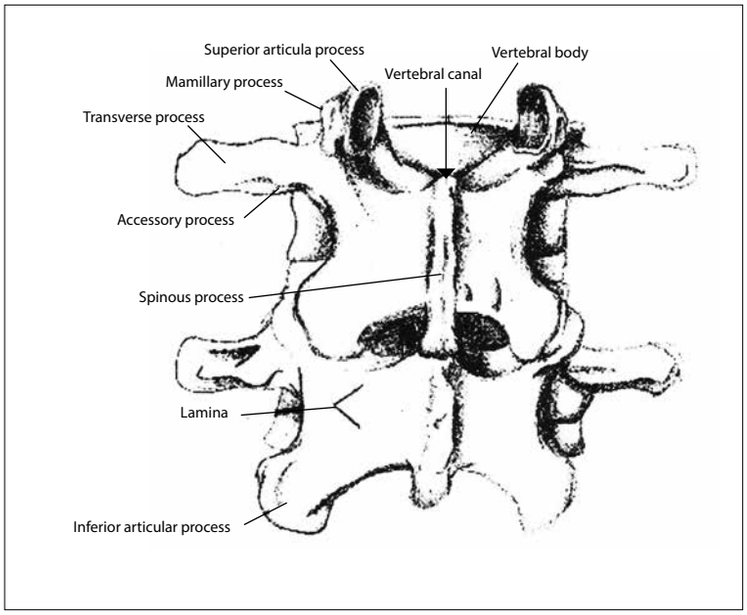



FIGURE 7. Lumbar vertebral facets (labeled above as superior articular process) are architecturally designed to promote forward and backward bending.

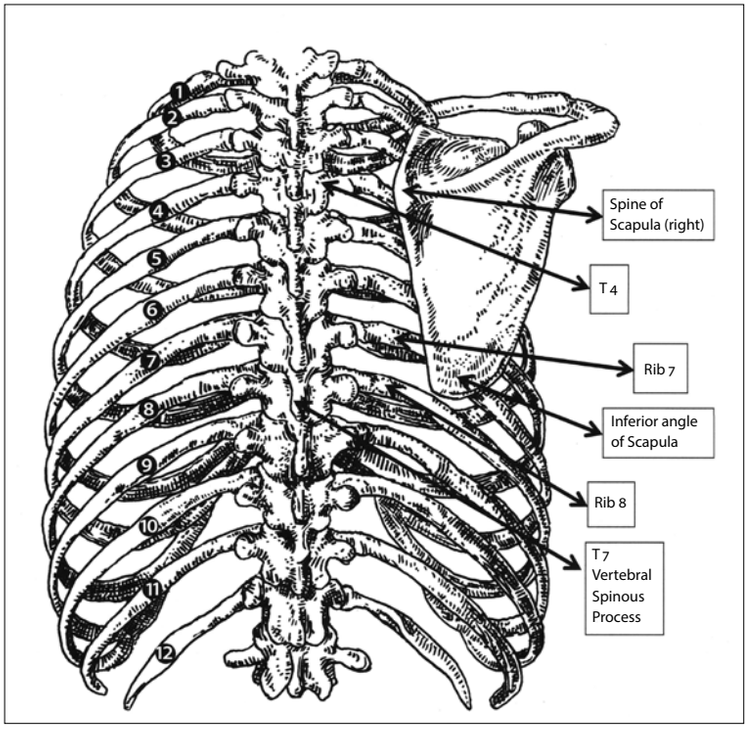



FIGURE 8. Bony framework of the thorax (posterior view).

One of the novel skeletal handles worth exploring is the bilateral anterior rib angles. Each anterior angle is made up of the ipsilateral lower six ribs. For people who suffer from chronic lower back pain due to degenerative discs and facet joint disease, most multi-planar movements of the pelvis occur at the waist level. This area is also known as the level of the iliac crests. Anatomically, this is the location between the fourth and fifth lumbar vertebrae (Figure 7).

Not all vertebrae are designed to rotate in the horizontal plane. The skeletal architecture of the interlocking lumbar facet joints is designed to have the least amount of horizontal

rotation within the entire spine.[29] The lumbar facet joints are specifically designed for forward and backward motion in the sagittal plane (Figure 8). This forward and backward movement is between 12 o'clock and 6 o'clock on the pelvic clock when the clock is resting face-up on the lower abdomen and pubic area. Repetitive turning, stretching, rotating, and twisting movements at the waist level may therefore hinder rather than help those suffering from lower back pain. Exercise specialists, healthcare therapists, somatic practitioners, yoga enthusiasts, and massage therapists can take this into consideration when trying to help people who suffer from lower back and sacral pain. When used as an integral part of the ilium, the anterior angle of the rib allows for a more proportional distribution of the fulcrum of rotation across the facet joints of eleven vertebrae (Thoracic 7 through Lumbar 5) instead of just one or two vertebrae at the waist level (Lumbar 4-5). Therefore, degenerative pain from chronic tension, compression, and rotation through the lower lumbar spine can be altered.

To establish clarity of the multi-planar anterior rib angle movements with the pelvic girdle, the skeletal handles of Ribs 7-8 provide access to an under-defined self-image during functional movement patterns. Differentiation of the lower and upper divisions of the ribs in this area from the scapula can prove invaluable during Functional Integration lessons. Benefits include increased range-of-motion while reaching overhead with the same arm, increased shoulder/pelvis and head/shoulder differentiation, a more fluid activation of reciprocal arm swing during gait, and an increased stability during the single-legged stance.

This increased flexibility and differentiation also allows people to look over each shoulder while walking without losing their balance. The interior surfaces of anterior rib angles serve as the origin of the anterolateral attachments of the diaphragm (Figure 9). Differentiation between the upper and lower ribs allows the diaphragm to return to neutral. In turn, the reduction of chronically-held dysfunctional movement patterns in the diaphragm allows for an increase of volume during inhalation.

A lack of anatomical knowledge can contribute to an inaccurate or incomplete self-image. Take the scapula, for instance. People often feel the inferior angle of the scapula

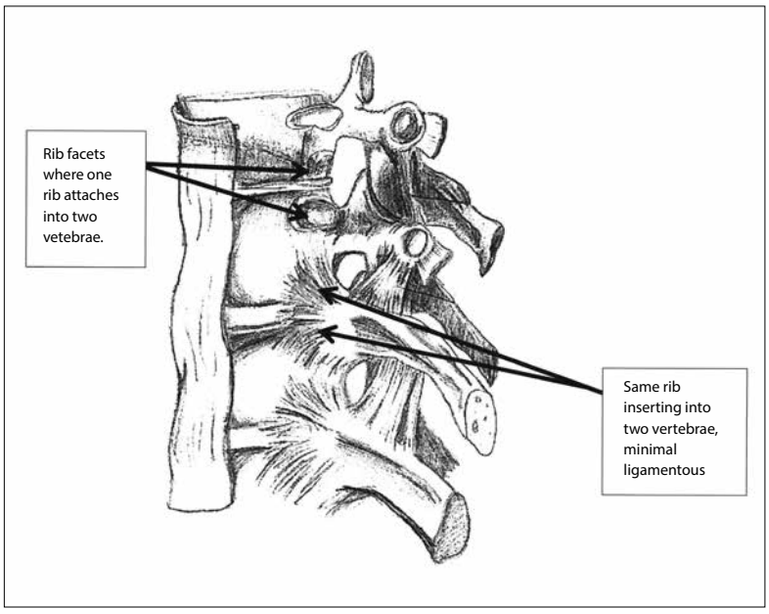



FIGURE 9. Thoracic vertebra and corresponding rib. Three views or levels of anatomy illustrating how one rib attaches into two vertebrae: maximum ligamentous support, minimal ligamentous support and rib facets

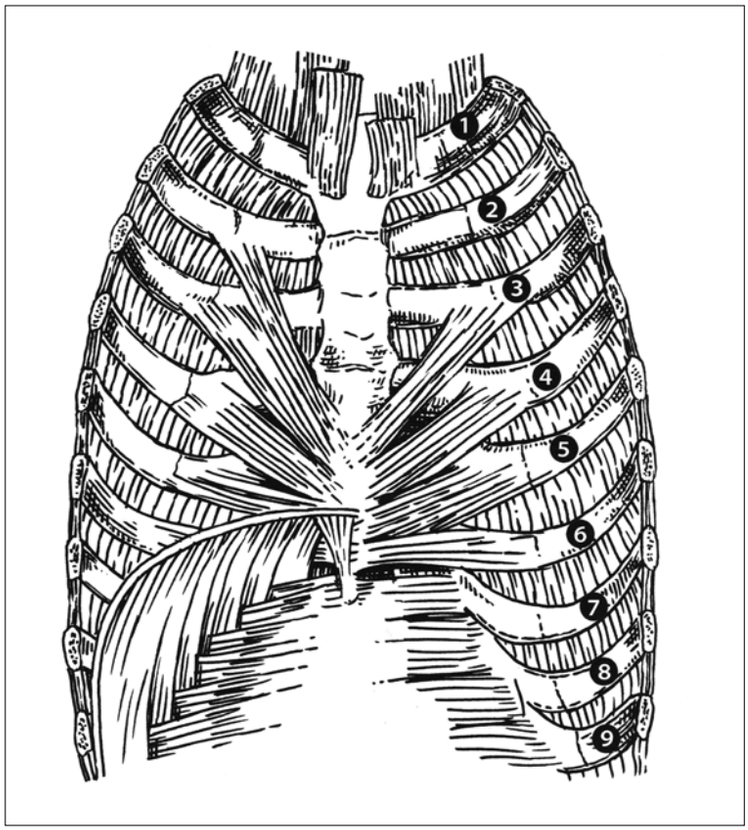



FIGURE 10. Interior surface of the anterior thoracic wall.

sliding over their ribs and erroneously assume they are feeling their upper ribs (Figure 10). The configuration of ribs is frequently (and mistakenly) viewed as a stack of plates. Like a plate, the front edge of the plate can be traced around, where the back edge is presumed to be at the same level as the front edge. As we know, this is not true in the structure of human ribs (Figure 5). The inferior angle of the scapula is an easily-palpated skeletal landmark used in Feldenkrais training to assist in differentiating movements (assuming the scapula is "ideally" located on the back). Rib 7 can be found directly underneath the inferior angle area, which leaves Rib 8 available for uninterrupted palpation and serves as a consistent landmark for counting and identifying the ribs above and below. Ribs 2-9 attach directly to their corresponding vertebrae *and* also to the vertebrae above. Rib 1 and Ribs 10-12 are *singularly* attached to their corresponding vertebrae. For example, Rib 8 attaches to the vertebral bodies of T8 and T7 (Figure 11); however, the long skeletal handle of the vertebral spinous process of T8 lies at the Rib 9 level (Figure 10). It is no surprise, therefore, that many people lack the anatomical knowledge necessary for a more complete self-image, given the various subtleties and nuances of the body.

All sensory systems of the human body deliver information to the brain in orderly maps.[30] The ability to discriminate between two points of contact on the skin relies on the density of sensory receptors within the area. For example, the skin on the fingertips contains about 100 times more receptors per square centimeter than the skin on the back.[31] Additionally, the middle back, which is rich in the mechanoreceptors that are located in all muscles and joint capsules, plays an important role in proprioception and motor control.[32] Through selective pressure and differentiated movement of skeletal joints within the area,

| FIGURE 11. Examples of key skeletal handles that can bridge the gap between anatomy and functional anatomy |
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| |
| Bilateral Anterior RibAngles |
| Spine of theScapula |
| Posterior LateralRib |
| Sternum |
| Inferior Angle of theScapula |
| SC Joint-Proximal andClavicle |

the undescribed self-image in the middle back can be made clear. During Functional Integration® lessons, consider the importance of the *spine of the scapula* (Figure 10). This dense area of bone is a prime skeletal handle, as the fossa above and below the spine of the scapula can be quite thin and flat. Anatomically, the ideal resting position of the spine of the scapula is at the Rib 4 level. Knowing this anatomical connection allows practitioners to easily make the following two functional anatomy connections:

First, the elusive mid-scapular ribs can be located individually and identified easily. Posterior rib clarity is further highlighted to its anterior skeletal handle counterpart at the level of the sternum. Using a slight but clear compressive force, the two skeletal handles become linked. Practitioners can produce a three-dimensional "see-saw" effect for students by moving the two ends simultaneously and in opposite directions. Clock images superimposed over the sternum and/or the middle back can further clarify and anchor the three-dimensional movement experience. Students can reliably replicate this movement themselves by using the clock numbers. Functionally reaching overhead or out to the side is easily permitted, as trunk elongation is possible without excessive arching or increased lumbar lordosis. The "see-saw" movement is hidden in all counter-rotating functional movement patterns.

Second, by locating Rib 4, practitioners can outline and differentiate the Thoracic Vertebra 3-5. The spine of the scapula can then be used as a bridge to connect the hand and arm to the middle back. Clarity in this connection can lead to a perceived increased in strength, as multiple skeletal areas are congruently aligned and ready for any functional activity that involves pushing, pulling, or weight-bearing through the upper extremities. The upward sloping of the spine of the scapula also acts as an extension of the upper arm, especially when it is positioned in 120 degrees of flexion, scaption (elevation), or abduction.

**NOTE**: The rib level associated with the spine of the scapula can change. As practitioners, do not be misled. It can be altered by the winging, tipping, or tilting of the scapula due to alteration in the normal amount of thoracic kyphosis, muscular imbalances of the shoulder girdle, or poor organization of the pelvis.

When both shoulder girdles are viewed together, their anterior connection is very similar to the connection of the two ilia that make up the right and left sides of the pelvic girdle.

Unlike the pelvic girdle, however, there is no counterpart to the sacrum that binds the posterior aspects of the shoulder girdles. A shoulder girdle is comprised of three bones – the clavicle, the scapula, and the humerus. It is common for clients and students to have an inaccurate self-image of the scapula and the clavicle while walking. A lack of anatomical understanding may be one reason for this confusion. Most people perceive that the scapula and the clavicle are fixed or attached securely to the trunk. Indeed, there are muscular and ligamentous attachments that connect those areas to the ribs, but most people are unaware that there is only *one* true anatomical joint connecting these bones to the axial skeleton. The sternocostal (SC) joint connects the proximal end of the clavicle to the sternum (Figure 5). When the clavicle, the scapula, and the humerus are envisioned together as a single lever, the SC joint becomes the primary axis for functional movement. The subtle three-dimensional rotation of the scapula and the clavicle through their respective joints (the acromioclavicular joint and the SC joint) sets in motion the quality of movement of the entire shoulder girdle. The sensation of three-dimensional movement at this joint is often unfamiliar in a person's self-image.

Given this knowledge of shoulder girdle anatomy, functional anatomy can now be considered during the shoulder clock lessons. Movement toward each clock position can now reach beyond the familiar ball-and-socket description of the arm and shoulder blade. Clock movements can now reach the less familiar SC joint, especially when performed by the arm in a variety of positions. In turn, the SC joint can now be used as a skeletal handle during Functional Integration lessons to complete the three-dimensional self-image of the shoulder girdle. And finally, functional movement patterns and the maturation of kinesthetic imagination and awareness can now help us discover and differentiate how the specific *parts* of a function relate to the *whole* of a person.

Walking upright allows for the functional freedom of our upper limbs and hands. Individuals with a more developed and mature self-image are able to better sense movement through the collective architecture of each joint when an action is performed. The conscious sensation of this kinematic chain leads to a deeper awareness of functional anatomy and its application within specific movement patterns. As practitioners, you may now understand and explore the potency of skeletal handles in relationship to functional anatomy and IHG theory and consider the following questions:

What impact does gait have on neck, shoulder, and upper/lower back health?

Why is gait so important to human health and in relieving chronic pain patterns?

When is walking an agent of health versus an agent of disease?

Does the scapula move *over* the ribs, or do the ribs move *under* the scapula during walking?

What happens to the counter-rotations of the shoulder and pelvic girdles in the presence of poor posture or distortion in the normal anatomical curves of the spine and/or ribs (functional or anatomical scoliosis)?

## CONCLUSION

Through our academic studies and practical experiences, we understand that the growth process is never complete, and we understand that we possess an infinite capacity for

learning. As Feldenkrais practitioners, we know that when we move differently, we begin to look at life differently. May this introduction to Integral Human Gait™ theory add another dimension to your Feldenkrais Awareness Through Movement and Functional Integration lessons and provide you with some additional teaching tools. Consider the concepts of skeletal handles and counter-rotation within and between the pelvic and shoulder girdles. And be open to the idea that increasing levels of attention and awareness allow people to expand their self-image from something that is flat and two-dimensional to something that is more interactive, responsive, and three-dimensional. According to Feldenkrais, we do not have to return to "being a baby in order to function properly."[33] We can learn to move, walk, and stand differently because we are capable of re-wiring the very nature of our brains. We just have to remember that "there is nothing permanent or compulsive in [our] system, except what [we] believe to be so."[34]

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