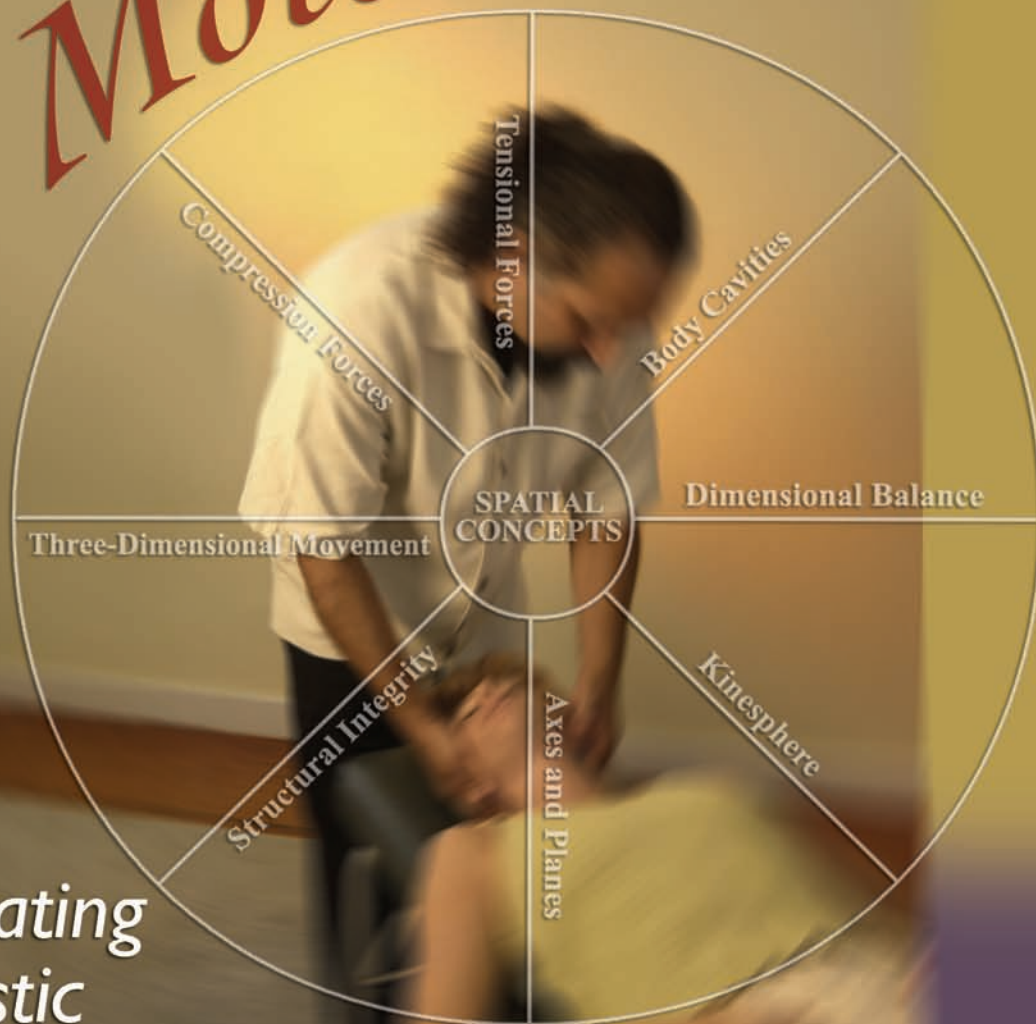


# *Somatic Anatomy*

## *Wheels of Motion*



*Integrating  
a holistic  
paradigm  
into traditional  
studies of anatomy  
and physiology*

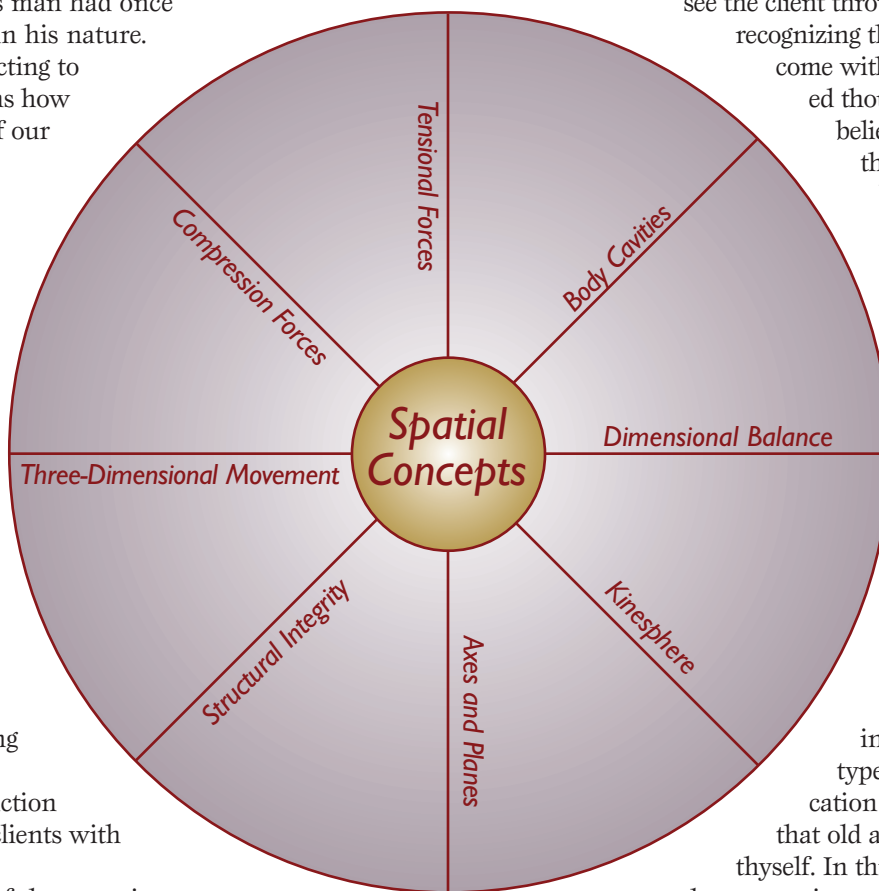
By Mary Ann Foster

A young man I know lived in self-defeating angst due to a habit he could not break. Every payday, he felt compelled to share his meager wages with the poor people of his community, leaving him with guilt about providing less than he might have for his family.

One day by chance, this man, who was orphaned at birth, met a distant relative who shared some family history. It turns out his grandfather, a well-to-do baker in a small town, had depleted his savings distributing bread to the hungry during the Great Depression. Connecting with his altruistic roots triggered a healing transformation for the young man. It stirred deep feelings of dignity and self-respect, healing what this generous man had once considered a flaw in his nature.

For many, connecting to our history confirms how deeply the values of our actions are built on the work of our predecessors. I see this in the massage field. Whether aware of our history or not, many massage students and practitioners practice in a holistic vein, using somatic skills to help our clients. We love guiding our clients through the release of pain or distressing emotions. And we receive great satisfaction from empowering clients with self-help exercises.

The popularity of therapeutic Swedish massage began during the healing arts revival of the 1960s and 1970s when massage schools focused on personal growth and experiential learning. As the field grew, so too did the place of science in the classroom. With the infusion of neuromuscular therapies in the 1980s, the profession began to polarize. In the holistic camp, practitioners apply massage to help clients make healing connections between the various parts of the body, mind, and spirit, striving to improve overall health. In the medical/orthopedic camp, practitioners treat specific musculoskeletal problems with particular manual therapy techniques.



Many continue to see these two camps as at odds, but I do not. Instead, I believe manual therapy can be practiced holistically to improve full-body, whole-person patterns. This scope of practice does, however, depend on the orientation of massage training. We often learn to improve a client's overall health and well-being through soft-tissue manipulation. Since medical evaluation or treatment lies outside our scope of practice, we learn to make general assessments of clients' health and goals, and then tailor massage to their individual needs. In this regard, therapeutic massage is usually practiced within a holistic, client-centered paradigm, which draws on a broad array

of knowledge and skills. Holistic practitioners see the client through a somatic lens, recognizing that body problems come with an array of associated thoughts, emotions, and beliefs and addressing these multifaceted levels with somatic, client-centered skills such as body awareness, breathing exercises, and neuromuscular education.

Hands-on skills in massage are usually presented as somatic education, where we study our own patterns and practice on our classmates. Whether intentional or not, this type of experiential education leads the student to that old adage — healer, heal thyself. In this vein, massage students experience firsthand the dynamics of somatic anatomy in holistic healing:

how various parts connect; how thoughts, feelings, and beliefs affect physical health; and how we can empower clients with tools for change.

In a holistic paradigm, we strive to get all parts of a person to move in synchrony and harmony in order to improve overall function. Yet in our age of medical specialization, anatomy and physiology are usually presented as a linear accumulation of facts disconnected from the practice of massage. Integrating somatics into the study of science can orient a massage student toward a holistic scope of practice.

In the series of articles titled Somatic Anatomy that begins here, I advocate just that — integrating the holistic paradigm into traditional studies of anatomy and physiology by linking cognitive with experiential learning. This series draws on traditional studies; current research in posture, pain, and energy medicine; and a number of somatic modalities. In keeping with the holistic theme, each general topic is introduced as a “wheel of motion.” The hub is the central idea of the article, and each spoke of the wheel develops some aspect of the hub. The organization is radial to emphasize the holistic design of living beings. All parts relate equally to the whole as each spoke relates equally to the hub. No one part is more important than another.

It is my hope that this Somatic Anatomy series moves somatic skills — now usually taught in advanced studies — to the beginning of massage trainings. Why? To distinguish therapeutic massage from traditional physical therapy with our unique somatic skills. To re-embrace the essence of what birthed the massage revival of the last century. And, most of all, to recover our holistic, client-centered roots lest we become angst-filled orphans unable to recognize our own rich healing traditions.

*Everything we do teaches the body something, either reinforcing bad habits or improving healthy habits.*

### Spatial Concepts

What if scientists told us that solar disruptions would soon cloak the world in darkness, that a fast-moving arctic blizzard would bury all tropical beaches, or that a decrease in the gravitational pull would cause small bodies to levitate? Sci-fi writers might pen such ghastly scenarios for entertainment, but our trust in predictable patterns runs so deep that such horrors usually lie latent in the collective unconscious. The regularity of patterns in biological systems not only sets our minds at ease, it fortifies our unspoken faith in the reliability of the body’s health. It is easy to take for granted that we will wake in the same state we retired in, and that in the absence of pain or symptoms everything is OK. In fact, a baseline of good health is so normal that most people rarely notice disease or injury until its abnormal sensations break the continuity of our awareness.



**Figure 1 — Note the spatial balance, proportion, and coordination in this gymnast.**

Human beings have an innate ability to perceive patterns in their entirety. Our natural aptitude for pattern recognition allows us to see the entire configuration in just a glance. The most visible patterns of the body are its shape and movement. We recognize friends at a distance by their stance or stride or spot a world-class athlete by the balance, proportion, and coordination of her entire body (see Figure 1). Conversely, the eye is drawn to breaks in the continuity of shape and flow; the frozen arm or staccato limp jumps out like an attention-getting beacon specifically designed by Mother Nature to call for help.

Perhaps because the body’s shape and movement are the first aspects we notice, the study of anatomy and physiology begins with spatial concepts — specifically with terms identifying planes, cavities, and directions. Like the longitude and latitude markers on a globe, body parts and actions are described by anatomists with consistent spatial terms to ensure we are all referring to the same thing.

### 1) Dimensional Balance

Spatial concepts provide more than just congruent anatomical terms. They translate into a map of dimensional balance in the body. In the same way the sturdiness of a building shows up in straight, symmetrical, and level floors, walls, and ceilings, structural integrity shows up in the dimensional balance of the body. Granted, the living tissues of plasma-based humans are much more complex than the structural materials of an inert building, yet each living body still has a relative





**Figures 2A and 2B — Compare the dimensional balance of these two runners.**

top, bottom, sides, front, and back. Similar to buckling walls or sagging roofs in a house, dimensional imbalances in the body — such as collapsed chests or bent backs, flat feet or twisted hips — highlight areas where the body has lost dimensional balance and support and needs a healing hand (see Figures 2A and 2B).

**Exercise 1 — Seated Pelvic Rock**

Here is a simple exercise to center your pelvis and get over your base of support.

- Sit on a firm chair and notice your posture. Where is your weight resting: on top of, in front of, or behind your sit bones?
- Put both feet flat on the floor in line with your hips. Rock your pelvis forward and back over your sit bones, as though your sit bones are the bottom of a wheel that you were turning back and forth. Go back and forth several times (see Exercise 1). Feel the place where you are centered on top of both sit bones. Stop there and rest.

Is this position different from how you're used to sitting? Sitting behind your sit bones compresses the



**Exercise 1 — Seated Pelvic Rock**

sacrum and lower back. Sitting in front of the sit bones overworks the lower back. Sitting right on top gives you optimal support and dimensional balance. Check your seated position several times during the day. Then, rock your pelvis to loosen up and reposition.

**2) Kinesphere**

A kinesphere is the conceptual shape around a person that she habitually moves in. A person with a balanced body and a full range of motion moves in a kinesphere shaped like a bubble — round and balanced in every direction (see Figure 3).



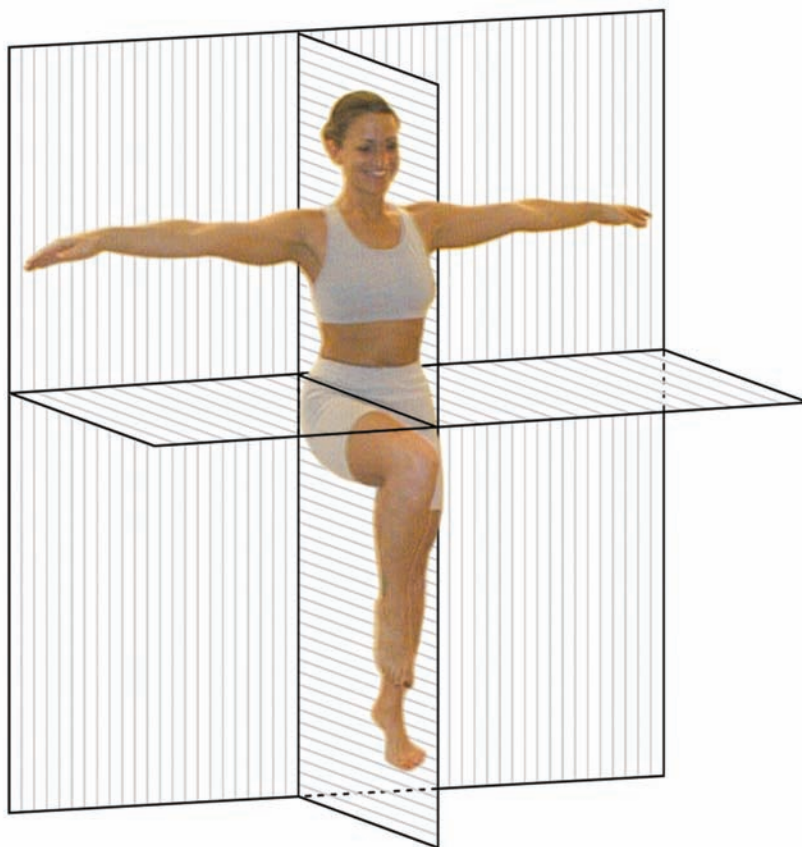
We imagine the kinesphere around a person with a collapsed chest sagging in the upper front area. Massage strokes that expand and lift the chest, filling out the sagging area of this conceptual bubble, could restore dimensional balance to this person's body.

**Figure 3 — A kinesphere is a conceptual bubble around a person depicting the space he moves within during his normal or habitual range of motion.**

The shape of an individual's posture and movement also reveals a lot about the psyche. For example, the proud walk tall, the shamed stoop, the depressed deflate, and the fearful cower, each with a distinct kinesphere sculpted by how and where they hold emotions.

**3) Axes and Planes**

The space between two points constitutes an axis, and the space between four points constitutes a plane. An axis is a line, and a plane is a flat square or rectangle. This may sound overly simplistic, but the



**Figure 4** — This model demonstrates spatial reach patterns balanced in the three planes.

human body is oriented along the longitudinal axis. Its outer surfaces lie in each of the three planes: the front and back of the body in the frontal (or coronal) plane; the top of the head and shoulders plus the bottom of feet and pelvis in the horizontal (or transverse) plane; and the sides of the trunk, head and neck, and limbs in the sagittal plane (see Figure 4).

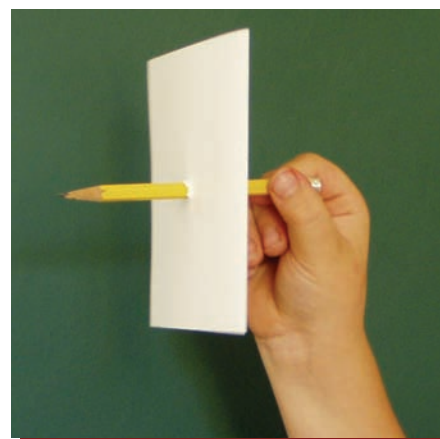
Human beings have a strong affinity for upward and forward directions. We are the only mammals with an upright spine; some connect our strong skyward pull with spiritual inclinations. We are also front-facing creatures — relating to others through the sense organs on our faces and the vulnerable surfaces of our chests and bellies — moving forward in life via the sagittal swing of the arms and legs.

### Exercise 2 — Axes and Planes

Here is a simple exercise to help you identify what movement occurs in each plane along which axis. Keep in mind that each axis bisects a plane, and movement in a specific plane occurs around that axis.

- Get a piece of paper and push a pencil through the center of it. The paper is the plane, the pencil the axis.

- Hold the paper next to the body in each of the three planes. For example, hold the paper in the same plane as the front of the body (the frontal plane), holding the pencil along a front/back axis (see Exercise 2).
- Now turn the paper around the pencil. Then, move in the same direction as the paper, first with the spine, then with each limb.
- Repeat each step in the horizontal and sagittal planes.



**Exercise 2** — Axes and Planes

### 4) Structural Integrity

Many practitioners use massage to stretch, lengthen, and relax chronically tight and held muscles. But to what end? Usually to relieve pain, reduce stress, and increase body awareness. Practicing massage in a holistic paradigm adds a more encompassing intention — to leave our clients more integrated and whole than when they came in. In regards to spatial concepts, this means leaving clients' tissues in a more aligned and organized state — both primary elements of structural integrity.

Every massage has the potential to leave the client taller and straighter. Each stroke feeds new information into the neuromuscular system. This input can increase or decrease spatial organization. To improve organization, we need to address full-body patterns, relaxing and stretching tight, over-facilitated muscles while increasing awareness and tone in weak, chronically inhibited muscles.

Moving the tissue toward optimal alignment during a Swedish massage can give the client a passive education in structural integrity, often restoring a body memory of optimal alignment. Although Swedish strokes toward the heart are vital for people with circulatory problems, long strokes out the limbs decompress joints, →



elongate short muscles, and realign bones. When clients ask how to keep this new feeling, they invite you to teach them simple alignment exercises for empowerment.

### Exercise 3 — Assessing Structural Integrity

Assess the structural integrity of a partner by having her stand and viewing her from all directions, then ask yourself the following questions:

- Which areas look open and relaxed? Which look held, pulled up and back or down and in? Which areas are collapsed, sloped, folded, rolled in or out, or bent?
- How do chronic rotations in one area translate to another area?
- Are the legs under the body? Are the hips, knees, and ankles aligned in the same plane? Are the ankles, knees, hips, and clavicles relatively horizontal? Are the Achilles tendons vertical?
- Do the scapulas lie flat? Are the arms hanging from the sides, or have they migrated forward, back, or up?
- Are the sides actually on the sides, or are they chronically rotated, wrapping either around the front or back? Are the spinal curves long and even or excessively short and bent? Are the spinal curves relatively vertical?

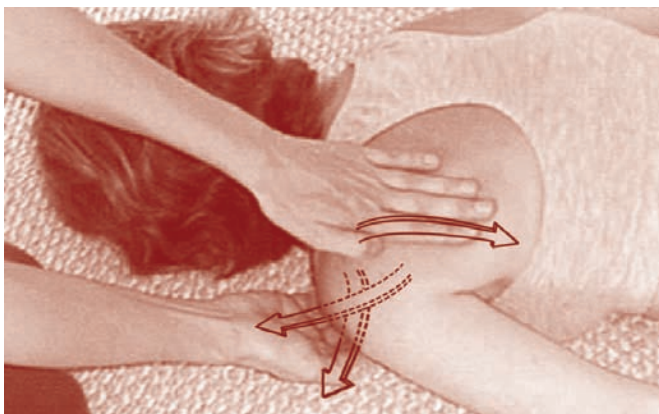
If you were to give this person a full-body massage, to what areas would you bring more length, width, and depth in order to improve the person's structural integrity?

### 5) Three-Dimensional Movement

There are no straight lines in the body. All natural movements occur in curved pathways that simultaneously traverse all three planes (see Figure 5). Take for example brushing the hair, reaching to a top shelf, or bending over to scratch a foot. Each of these actions shifts the spine and limbs into long, pliable curves (if the body is flexible). Young children move with supple three-dimensional curves. In contrast, movement restricted to one plane is unnatural and rigid, like the Frankenstein walk or the goose-step march.



**Figure 5 — Notice how multiple joint rotations organize this batter's swing along the axis of the bat.**



**Figure 6 — To move the scapula to a more balanced alignment, this practitioner adjusts it in three directions.**

Natural curvilinear motion in all three planes is the basis of proprioceptive neuromuscular facilitation (PNF) patterns. Each PNF pattern is a combination of three actions: either flexion or extension, medial or lateral rotation, and abduction or adduction.

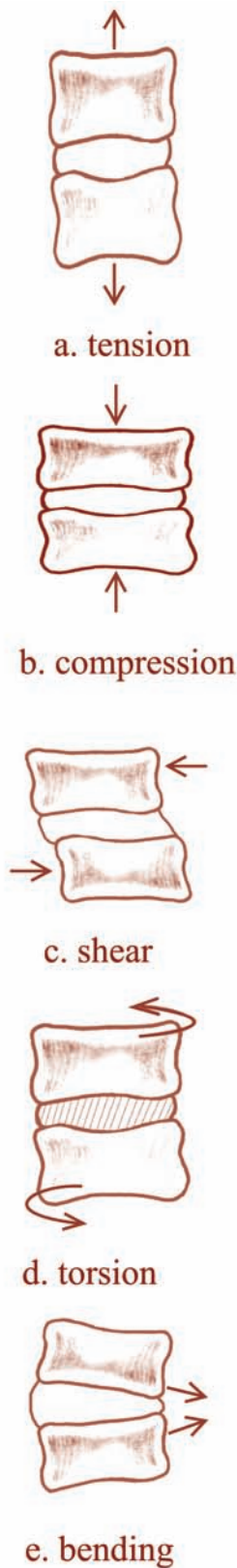
Massage strokes that reposition the body toward optimal alignment need to be three dimensional, like the PNF patterns. It is not enough to simply push winged scapulae down. The scapula in a prone client usually needs curvilinear strokes in three directions to laterally rotate, tilt, and retract it (see Figure 6). Likewise, long, curved strokes that spiral from the lower back to the knee — intentionally extending, medially rotating, and adducting the thigh — work well to realign the lower limb under the trunk. Of course, the direction of each stroke is relative to each client's needs.

### Exercise 4 — Three-dimensional Massage

With a partner, explore long, broad effleurage strokes that spiral around the limbs and trunk. Be creative. Let your hands mold around the shape of the body, following the grain of the muscles along curved, three-dimensional pathways. Take each stroke from the trunk out the hands and feet to decompress the joints along that limb. Take each stroke along the spine between the top and bottom to decompress it. As you cover one surface of the body, keep an awareness of the three-dimensional volume of the body.

### 6) Compression Forces

A number of mechanical forces affect the body, including tension, compression, shear, torsion, and bending forces (see Figures 7A to 7E). Compression forces from



Figures 7A to 7E — These mechanical forces have a strong effect on the joints.

weight-bearing and pushing actions are modulated by tensional forces generated by extension and reaching actions. Ideally, compression forces are borne by the most rigid and least likely to collapse tissues — the bones. When compression passes through the center of a joint, it places that joint under axial compression, which is its most stable position.

When massage therapists apply pressure, they compress not only the client's body, but also their own. If the bones are optimally aligned, compression is absorbed through a series of joints. Bending forces are the most damaging to joints. Repetitive compression through a bent joint will cause repetitive strain, a common source of injury in massage practitioners (see Figure 8A). With this in mind, a practitioner needs to work with an alignment that allows compressive forces to be absorbed by a series of joints, ideally from the hands to the feet through the spine (see Figure 8B).

**Exercise 5 — Shoulder Push and Postural Sway**

Use this exercise to feel compressive forces travel between the upper and lower body.

- Have your partner stand in front of you with extended (not locked) knees. Lightly press down on both his shoulders. If his upper body is over his lower body, he will feel the compression through his spine and hips into his feet. If he is off center, his back will bow or bend.
- If he was off center, have him close his eyes and subtly sway, stopping in the place where his upper body feels like it is over his feet. Then, press again. If his body is vertically aligned, the compression should go into his feet.

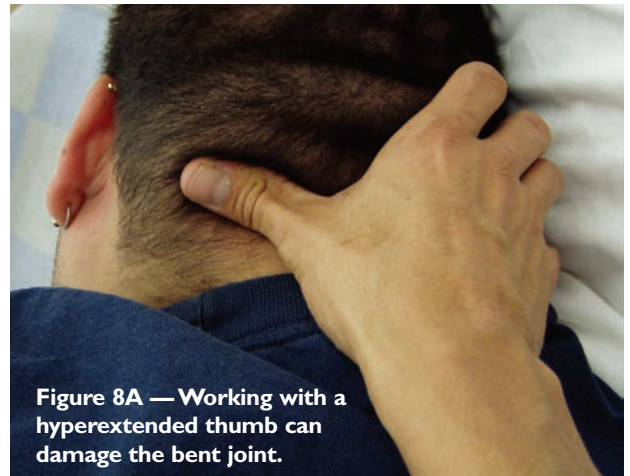


Figure 8A — Working with a hyperextended thumb can damage the bent joint.

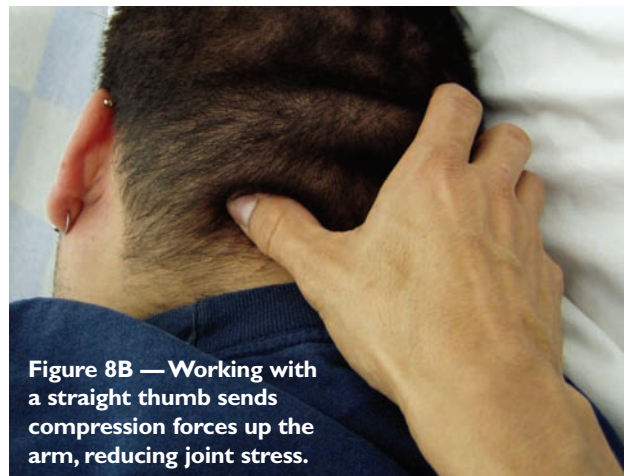


Figure 8B — Working with a straight thumb sends compression forces up the arm, reducing joint stress.

Note that many people stand with the upper body behind the lower body, creating a distorted perception that leaning back is straight. Then, when they shift forward, they may feel like they are going to fall.

**7) Tensional Forces**

In the same way that counterbalancing guide ropes around supporting poles keep a tent upright, a grid-like network of tensional forces in the myofascial tissues

*Integrating somatics into the study of science can orient a massage student toward a holistic scope of practice.*



support the upright posture (see Figure 9). The elastic muscles and their associated fascia wrap the body like a three-dimensional suit, balancing the body around its central axis.

Ideally, the complex web of tensional pulls and counter-pulls in the myofascial fabric has taut, unwrinkled spans. Even and balanced tensional forces extend, lift, and lengthen the body. Tensional forces translate through the fabric of the body from one area to another. A reach up with the head lengthens the spine of the poised; a reach out with the hands steadies the balance of the tipsy.

In the same way tensional pulls lengthen tissues from one end to the other, chronically tight muscles shorten tissues. For example, tight back muscles can shorten tissues down the back all the way to the feet. To release myofascial tensions in a holistic manner, lines of shortened tissues (or “anatomy trains”) need to be unraveled one layer at a time, starting with the superficial lines and working down to the deeper layers.

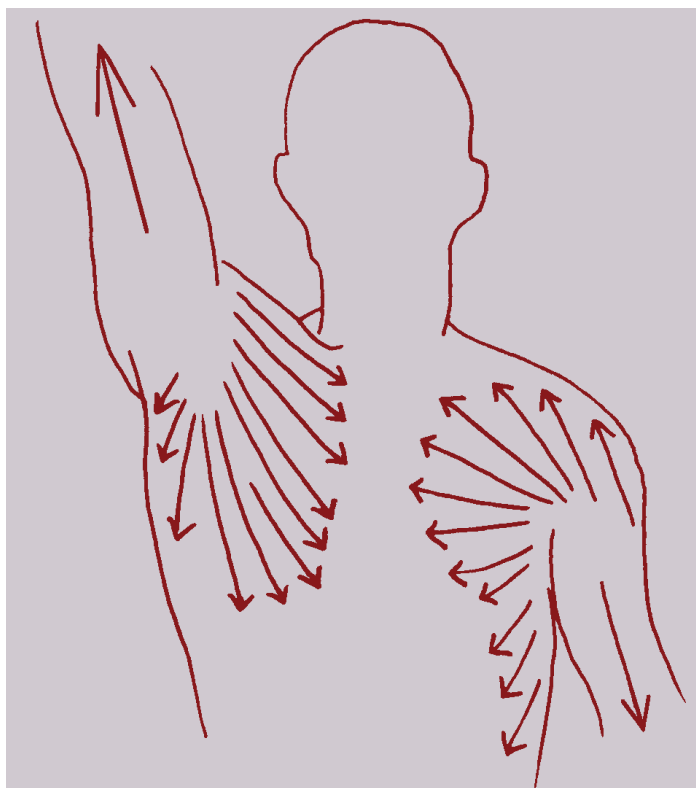
### Exercise 6 — Restoring Tensional Balance

Teach these simple exercises to your clients in a seated position to restore tensional balance to deep postural muscles. You can also teach them to clients while they lie on the table.

- Start seated. Lightly and slowly reach the top of your head toward the ceiling without dropping your chin. You should feel your entire spine elongate. Hold and take several easy breaths along the length of your entire spine. Then, relax and repeat several times.
- Breathe into the lateral expansion of your lower ribs (see Exercise 6). This type of diaphragmatic breathing facilitates the respiratory diaphragm.
- Relax your abdomen and let your belly hang out. Next, lightly contract the perineal muscles by slowly drawing your sit bones together. At the same time, lightly contract your lower abdominals by slowly drawing the muscles above your pubic bone straight back. Make sure to keep your upper abdominal muscles relaxed or they will restrict breathing. Hold and take several easy breaths. Then, relax and repeat.



**Exercise 6 — Restoring Tensional Balance**



**Figure 9 — The tensional pulls of the shoulder muscles are like spokes on a wheel.**

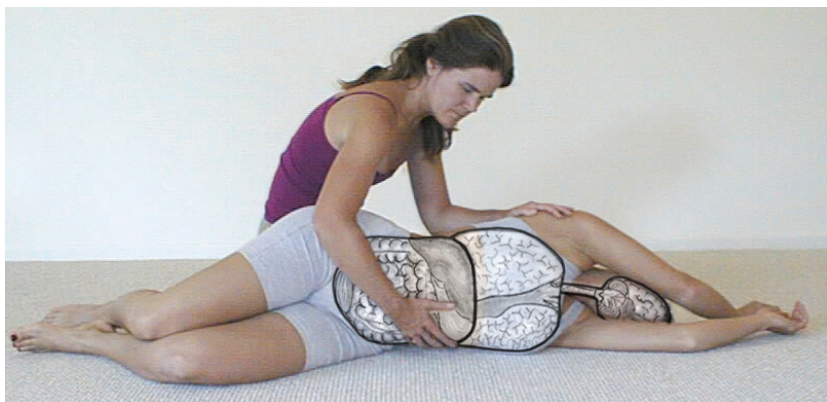
- Combine steps 1 to 3. First, lengthen the spine. Then, breathe into the width of the ribs. Finally, lightly contract the lower abdominals and pelvic floor muscles to improve tensional support in all three dimensions. Hold and take several easy breaths, then relax. Repeat several times.

### 8) Body Cavities

The body cavities that fill the trunk and skull contain and protect the organs, giving the body volume. The dorsal cavity, bulbous with a long tail, houses the brain and spinal cord; the double-barrel thoracic cavity houses the heart and lungs; the cylindrical abdominal cavity houses the abdominal viscera; and the bowl-shaped pelvic cavity houses the lower abdominal organs. As we move, or move our clients, the organs shift slightly within each cavity, sinking into the underside of the body (see Figure 10, page 104).

We may think of poor posture as solely a muscular imbalance, but mechanical strain from poor posture can →





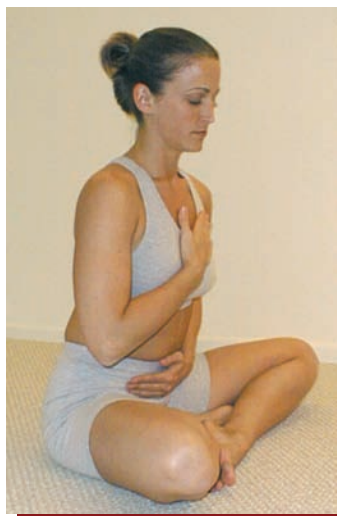
**Figure 10** — This practitioner helps her client sense the organ weight in the body cavities sink into the ground.

stress the organs and their enveloping fascias. For example, a collapsed chest compresses the heart, lungs, and abdominal viscera, potentially affecting circulation, breath, and digestion; a head-forward posture literally bends the spinal cord and circulatory tubes in the neck, blocking nerve and blood circulation and potentially causing chronic pain and headaches. For these reasons, dimensional balance in the body is vital to support the volume of the body cavities and give the organs plenty of room to function normally.

### Exercise 7 — Organ Shift

You can do these exercises with any organ or have your clients explore them while on the table.

- Put your hands over your kidneys. Slowly arch your spine forward and back, feeling how this shifts your kidneys. Stop in the place where your kidneys feel comfortable and have plenty of room. Rest there and take several easy breaths into your kidney area.
- Place your hands over your heart (see Exercise 7). Lean forward and back, sensing your heart shift into your sternum, then toward your spine. Find the place in between where your heart feels centered in the middle. Now, explore lifting your chest and heart, then curling your spine, sensing your heart move up and down. Find the place in between where your heart feels comfortable and supported. Rest there and take several easy breaths into your heart.
- Close your eyes. Then, slowly roll your head forward and back, then side to side. Sense or imagine your brain



**Exercise 7** — Organ Shift

sinking toward your skull in each direction. Then, find the position in the middle where you sense your brain is resting over the heart. Relax there. Take several easy breaths into your head and along your spine.

### Pain-Free Alignment

A practitioner once commented, “I came to school to study massage but ended up learning about myself.” In the study of somatic anatomy, ultimately you are the

study; your body is or can be your personal laboratory. The choice is yours.

A somatic awareness of how the body occupies space may be the best guide to achieving pain-free alignment. You can use this spatial lens as a tool to assess and change full-body patterns. And you can practice alignment exercises to embody what you want for your clients. By being the example, you reap the

benefits of dimensional balance and structural integrity (i.e., injury prevention, burnout reduction, and career longevity). Plus, you will feel better and look better (who feels confident receiving massage from a practitioner suffering pain and injury from obviously poor posture?), which can only improve your clients’ confidence in your abilities.

Everything we do teaches the body something, either reinforcing bad habits or improving healthy habits. Whether a teacher or learner, this article can enliven your classes with a somatic anatomy approach, integrating what we usually study at arm’s length into experiential learning to strengthen the body-mind connection. **M&B**

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- 2 Working holistically requires a general knowledge of many body systems, an understanding of how they interact, the ability to recognize overall patterns within systems, and the ability to work with the relationship of parts to the whole. Being client centered requires interpersonal communication skills and flexible hands-on skills so that we can adapt our massage to the client’s unique goals and touch preferences.
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