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Tension, Truth, and Alignment: Understanding the Body Through Biomechanics

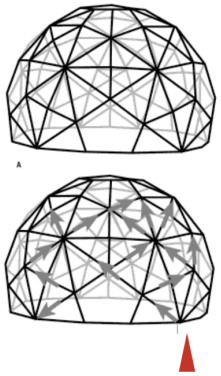
The human body is a tensegrity structure.

By Aimee Kolsby Cadiz

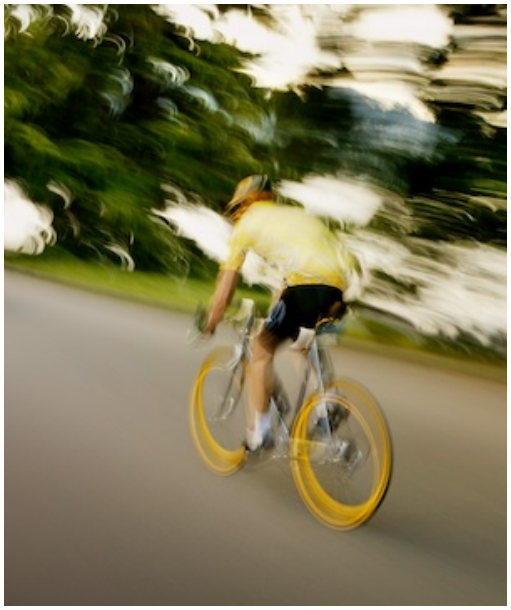
In a tensegrity structure, the beams (compression) are floating in wire (tension). In the human body, the bones (compression) are floating in the fascia (tension).

This simple, profound truth reshapes how we understand posture, movement, injury, and healing. Tensegrity - short for "tensional integrity" - is a structural principle where isolated compression elements (like bones) are suspended within a continuous tension network (like fascia, muscles, and tendons). In the human body, this means that no part functions in isolation. Every shift or strain, whether physical or emotional, ripples through the entire system.

Understanding the body as a tensegrity structure opens the door to a more nuanced and compassionate view of how we move through the world - especially when pain or dysfunction enters the picture. This framework, called biotensegrity, gives us language and logic for why old injuries resurface, why repetitive tasks can lead to chronic discomfort and how the human body, through compensations, will always adapt.



A geodesic dome is a tensegrity structure. Any external force will be transmitted omni-directionally to all parts of the structure.



Imagine this:

You're riding your bike down a sun-dappled country road. The warmth of the sun kisses your skin, and the breeze streams through your hair. It feels like freedom, smooth and effortless, as your body balances seamlessly with each pedal stroke. Suddenly, your front tire hits a patch of loose gravel. You feel it - a slip, a jolt - your equilibrium thrown off balance. Your arms instinctively tighten, your core braces, and your hips shift to stabilize you. You catch yourself and stay upright, but the moment lingers in your body.

Within a few minutes, you notice subtle shifts. A tightness sets in across your shoulders and pelvis. The muscles around your spine feel braced, and your movement isn't as fluid as it was just moments ago. That fleeting loss of balance has sent a ripple through your entire system.

At the same time, your body is doing something extraordinary: it reorients itself so that your eyes stay forward and ears to the side. This is your vestibular system at work, helping you to maintain balance and orient yourself in space. No matter how your body twists, turns, or compensates, this system ensures that you can see and hear your environment clearly.

Adaptation, Injury & the Wisdom of the Body

From the moment we take our first steps, the body is adapting - responding to gravity, to terrain, to experience. If you sprain your ankle, your structure doesn't wait for perfection before moving forward. It reroutes. It compensates. That slight lean away from pain becomes a habitual asymmetry. Over time, these compensations build layers: not just in muscle and bone, but in fascia, nervous system wiring, and perceptual patterns.

The same goes for repetitive strain - those unconscious habits in how we sit, type, drive, or carry children. Repetition without variation creates grooves in the body's landscape. What starts as efficient adaptation can, over time, become rigid patterning.

And what about belief systems? They too leave their mark. Whether it's a subconscious sense of unworthiness that collapses the chest or a need to push through pain that tightens the back, or the notion that you have to have your feet "on straight". The body listens. It reflects our internalized stories in the language of shape and tension. And just like with injuries or repetition, the system adapts to preserve function - even if that means creating strain elsewhere.

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This is how the body works: when we encounter a sudden imbalance, our fascia—the web of connective tissue that surrounds and supports everything in our body - responds. Initially, the tension is temporary, but if the pattern repeats or isn't addressed, those tension fibers can begin to lay down more permanent structures. Over time, the fascia creates semi-permanent holding patterns that lock in compensations.

This process of adapting to imbalance, holding tension patterns, and maintaining function is what Liz Gaggini calls Biomechanics of Adaptive Alignment. Liz developed a system to observe these compensations, understand how they affect the body's overall structure, and, most importantly, help people release the tension and holding patterns that keep them stuck. Her work allows individuals to return to their natural alignment, moving with integration and ease.

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Liz Gaggini and the Biomechanics of Adaptive Alignment:

Liz Gaggini's groundbreaking Biomechanics of Adaptive Alignment offers a path to unwind these patterns - not by imposing an external ideal, but by restoring each person's *Natural Alignment*.

Gaggini proposes that every human body has a structural proclivity - its own unique, genetically-determined map of efficient alignment. Natural Alignment doesn't mean standing up "straight" by arbitrary standards. It means finding the precise pattern of tension and suspension that allows your body to function with the least strain and the most vitality.

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The Path Back to Natural Alignment

Restoring Natural Alignment begins with accepting that the body has chosen the most integrative pattern to protect the structure. Sometimes a dysfunctional pattern is the best choice. It's the logic of the intuitive body and the vestibular system to find its way to equilibrium.

The practitioner learns to see asymmetries - tracking rotational patterns in the arms and legs, girdle asymmetries, spinal side bends and rotations, and the body's quiet calls for support.

Through this lens, biomechanics is not about "fixing" a body. It's about partnering with it - acknowledging the story it's told in tissue, tension, and tilt. And then, gently, helping it remember how to be itself again.

Whether you're a bodyworker, movement teacher, or simply someone living in a body with history and hope, the principles of biotensegrity and adaptive alignment offer a revolution in understanding. They remind us that pain is not a failure, and posture is not a moral stance.

Instead, every body is a living, breathing, dynamic system seeking balance - one that already contains the blueprint for healing.

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Want to learn more about Liz Gaggini's Biomechanics of Adaptive Alignment and upcoming trainings taught by Aimee Kolsby Cadiz? Visit aimeekolsby.com or join our monthly study group exploring fascia, function, and freedom of movement.

www.aimeekolsby.com