

# STRUCTURAL INTEGRATION

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In this issue we juxtapose the theoretical and the practical with two themes. Our first group of articles looks at tensegrity in its latest format – *biotensegrity* – while our second theme looks at the interface between Rolwing® Structural Integration (SI) and the healthcare system.

For almost as long as Rolwing SI has been in existence, Buckminster Fuller’s unique explanation of discontinuous compression structures has been studied and offered as the rationale behind Dr. Rolf’s conceptualization of how the body really works in gravity and why Rolwing SI works as well. A good example of this is Ron Kirkby’s article “The Probable Reality Behind Structural Integration: How Gravity Supports the Body.” [*Bulletin of Structural Integration*, October 1975 (Vol. 5, Issue 1), pp. 5-15. Available at <http://tinyurl.com/pbafhf4>.]

While *tensegrity* was an apt description with inanimate bodies, it had limitations when applied to living organisms. Thus, it eventually led to the concept of *biotensegrity*, tensegrity as applied to animate, living organisms. A useful reference on this sea change is the article “Paradigm Shift” by our Research/Science editor Szaja Gottlieb in the July 2015 issue (Vol. 43, Issue 2, pp. 66-68), which was a review of Graham Scarr’s groundbreaking book *Biotensegrity*. It is Graham, according to Gottlieb, who suggests we are looking at “nothing less than . . . a new discipline in the field of science.”

We are fortunate to entertain a number of articles on this first theme. First, Rolfer™ Brooke Thomas graciously shares with us transcripts of interviews she did on her program *The Liberated Body Podcast* ([www.liberatedbody.com/podcast/](http://www.liberatedbody.com/podcast/)). We have her interviews with “the father of biotensegrity,” Stephen Levin, and with clinical anatomist and biotensegrity pioneer John Sharkey, both explicitly addressing biotensegrity. We also have her interview with Jaap van der Wal, who addresses form embryologically and, in a sense, spiritually. For considerations within our own Rolwing SI community, we have articles from Rolfers Michael Maskornick and Luiz Fernando Bertolucci. Maskornick tells us how contemplating tensegrity/biotensegrity, and building tensegrity models, informs his understanding and his Rolwing practice. Bertolucci shares how an examination of certain unique aspects of his way of working led to the development of Tensegrity Touch – a methodology of touch that invokes tensegrity in ways that make our hands-on contact more targeted and effective.

Our second theme looks at Rolwing SI and Healthcare. Rolfers have traditionally operated outside of the healthcare system, going back to Ida Rolf who encouraged us to think of our work as ‘education’, famously stating, “gravity is the therapist.” Nonetheless, this has not stopped clients from associating our work with alternative medicine and seeking our services to help with pain and other issues that interface with the world of healthcare. In this issue, we hear from various members of our community who have operated within, or closely interacted with, the healthcare system. We share interviews with MD/Rolfers Thomas Findley and Wiley Patterson, and then hear from PT/Rolfer Bibiana Badenes, from certified medical technologist/MPH/Rolfer Linda Loggins, and from Rolfer Jeffrey Burch. You will find a multiplicity of viewpoints – as is common among Rolfers! There is clearly no one answer on whether Rolfers should be involved in healthcare, but it is a question each of us is forced to consider as we establish and pursue our practice of Rolwing SI.

**Anne F. Hoff**  
Editor-in-Chief



# Ask the Faculty

## Rolfing® Structural Integration and Healthcare

**Q:** *Rolfers™ have traditionally operated outside of the traditional healthcare system, yet more and more clients seek our assistance for issues that relate to pain and various health conditions. Have you engaged or interfaced with the healthcare system, and how have you done so while maintaining the integrity and identity of our work of Rolfing Structural Integration (SI)?*

**A:** The healthcare system was vastly different when I was certified thirty years ago. During the intervening years, my practice and the healthcare system have developed and evolved into an unexpected and oddly satisfying relationship.

During the mid-1980s, there was more time and discretionary income available for ventures into modalities such as Rolfing SI and exploring human potential. At that time, I found it easy to sidestep taking on new clients through workman's compensation or auto accident claims who sought out Rolfing SI to relieve the pain and discomfort of their injuries. But inevitably former 'cash' clients would be injured either at work or in an auto accident, and eventually I acquiesced to taking the extra time necessary to fill out and submit the required forms and SOAP notes, to bill according to diagnostic codes, etc., in order for them to receive the treatment they were entitled to according to their insurance claim.

Initially, I was fairly shortsighted: I was more invested in assuring my clients got the help they sought without incurring additional cost, and that my services would be covered by their insurance, than I was concerned with any long-term ramifications. I didn't particularly enjoy the extra time involved doing paperwork or the time lag for payment, however it usually (but not always) worked out.

Unexpectedly, what did ensue from this interface with the healthcare system was requests from these various clients to make presentations on the efficacy of Rolfing SI at their various workplaces – which have included Shriner's Children's Hospital, University of Hawaii School of Nursing, Kapiolani Community College Massage License Program, Institute of Clinical Acupuncture, etc. What began as a reluctant one-person endeavor ended up having a the favorable and far-reaching impact of raising public awareness of our work in the

healthcare field in my local community. This pleases me as it's a lot more fun to share what I know about Rolfing SI than to fill in the appropriate boxes on those silly forms.

**Sally Klemm**  
Advanced Rolfing Instructor

**A:** You can look at the question from different perspectives. One is a kind of 'administrative' (insurance) or even governmental (licensing) point of view. This has different implications in different countries, even within the EU where healthcare systems are not interrelated – there are lots of different histories of how healthcare systems developed within Europe. One example is that in Germany we have the so-called *Heilpraktiker* license, which allows the practitioner to treat clients outside of the traditional allopathic-oriented healthcare system. In France, there are very rigid regulations that almost prevent practitioners from treating people unless you are a medical doctor. (From my perspective, this is one of the reasons we still have almost no French Rolfers, even though France is part of the EU. Additionally, in Germany there are 'systemic' hierarchic regulations; for instance, even as a physical therapist (PT) you are not allowed to diagnose and treat clients without a prescription from an MD. You can imagine how delicate, difficult, and sometimes impossible it can be for Rolfers to interface with the healthcare system. Another point is that Dr. Rolf's method goes beyond the clinical frame of the healthcare system. Clinical work focuses more and more on details and seems to have lost the ability to look at people from a holistic point of view.

Sometimes I perceive myself as being caught between two opposing directions: staying with our method and our tradition on the one hand, or finding a meaningful response to increasing demand from what is outside – let's call it 'clinical'. As I have the situation of being a PT and a Rolfer, I

see the need to find answers that allow an attitude of 'as well as' instead of 'either/or'. I have no satisfying answer to this challenge, but I am more optimistic about the future given the latest research results and a slight movement towards the acknowledgment of complementary medicine methods. The challenge for us as SI practitioners might be how we answer the question of how to relate 'clinical aspects' (which needs to be defined) and the tradition of Rolfing SI in a meaningful way.

**Jörg Ahrend-Löns**  
Rolfing Instructor

**A:** What is the relationship between structural integration and traditional health care? To answer this question we confront our historical ambivalence and ambiguity about our work: ambivalence about who we are as practitioners; ambiguity around what it is that we do. What makes our work traditional? What makes our work non-traditional or distinctively different?

It's a puzzle: to the casual passerby, we apply hands to soft and bony tissue. We claim to affect things in the domain of physiotherapists, osteopaths, chiropractors, and even orthopedists. Is this comparison and apparent similarity apt? How do we wish to be perceived? Do we want to be categorized with physicians?

When we have clients who also see medical professionals, we notice an important conceptual difference. The medical field offers a paradigm of *treatment*. Rolf steered us away from the idea that we treat people, telling us we are not, in fact, therapists. She insisted we are educators. It's accurate to say 'body educators' – we coax forth the body's latent intelligence. This is not a trivial point.

Medically trained practitioners don't think in terms of patients' bodies needing better *information*. We don't hear physicians or physical therapists speaking about how to improve the ingredients to motor control as manifested in posture and movement. People who come to see us have usually not heard medical professionals use words like coordination, conflicted motor pattern, pre-movement, eccentricity/palintonicity, or self-regulation. During intake, clients tell us the names of their problem body parts. We rightly get the impression that traditional/medical models are *mechanical* models of dysfunction: an 'identify and fix the part to relieve the symptoms' approach. This isn't wrong; it's the medical point of view. How

might we characterize something different from a mechanical model?

Rolf had the chance, almost a century ago, to discern the difference between mechanical and *systems* approaches. In the 1920s and 1930s, holistic forms of thinking achieved popularity in the scientific world. Rolf conceived her work during a time in which 'systems views' of biological activity gained influence. Systems models posit that looking at parts can obscure a bigger picture. When we look at the big picture we ask different questions; we start, as Rolf put it, from a different premise.

Medicine plays a vital role. Parts need attention and medical models have their place. However, there is essential value in practitioners who offer a model, and a means, to help people function more intelligently, especially if they find little useful or lasting remedy from traditional fields. We have been educated to think about body systems holistically.

A concise example can be gleaned from an article I wrote for an earlier issue of this journal. A PT referred a man with trauma to his pelvis; he had undergone two surgeries to correct the source of his pain. The PT, who had worked with this individual continuously for several years, is skilled and intelligent. When I watched this new client move, it was obvious that his attention was directed toward control of his anatomy. He was working diligently to manage the 'parts', to make the right things move in the correct shape. Missing was a broad spectrum of skills to organize or reboot normalized movement. Missing were simple things like: a reasonable sense of weight and how this weight translates into support; perception of spatial orientation that translates into support; capacity to allow automatic governance to orchestrate his movement; evidence that fascial touch was used to differentiate his sensory and motor maps. The PT had done diligent work – but within a paradigm in which body parts are assessed as too weak or too strong, or incorrectly positioned. It's a mechanical model: what we often called a 'body-as-soft-machine' model. Structural integrators offer an *information* model – a *system* model – that posits that when a body behaves poorly, it's often not the fault of bad parts. Rather, it's the result of blocked intelligence and faulty information. Blocked intelligence and faulty information are remedied through a *process* of differentiation and integration, in which

a system organizes, learns, and anchors more intelligent motor activity.

The good news is that structural integrators occupy a niche in which soft/bony tissue manipulation and positioning don't have to become a limiting focus. We work within a field of inquiry that holds more complex and holistic questions about why a person does not spontaneously heal. To articulate this viewpoint, in words that are accessible, is a challenge – but hardly an insurmountable one. Words that do justice to Rolf's work are, moreover, less prone to imitation. We have the chance to offer clients a new perspective, a refreshing perspective. We offer a different model for those seeking new answers to a range of nagging physical and psychological issues. We have the opportunity to confront our field's historical ambivalence and ambiguity about who we are and what we do.

#### Kevin Frank Rolf Movement® Instructor

**A:** Perhaps it is an illusion to try and find a sort of objective answer for this question – there are so many subjective dimensions involved. I can only report my personal experience, more than forty years ago. I had ten sessions of Rolfing SI, later four sessions of the old advanced series. My Rolfer did not say a word about what this work is about, or should be about. He did the Ten Series with ninety-four people in my circle of acquaintances (yes, ninety-four! – this was during the 1970s). Most of them appreciated the ten basic sessions a lot, but not so much the old advanced series. There was no philosophy of Rolfing SI involved, no talk about alignment, no talk about gravity, and no talk about symptoms. There was almost no talk using words, but the touch of the practitioner talked to me on several levels. I experienced two dimensions of the process: the serious dysfunction in my left knee was handled brilliantly, and something happened to my organism as a whole – sort of a general 'lightness' and definitely a subtle correction of the way I was used to moving. It was a deep experience, and I am glad I wrote something down about it – as we know, our memory changes the content of our experiences all the time.

Later, when I came to the Rolf Institute® in Boulder as a young Rolfing instructor, I listened to the battles happening between some of us instructors. *Are Rolfers allowed to fix things or not?* Sitting there, I thought

this was a funny question. It is perhaps more meaningful to ask, "Are Rolfers *able* to fix things or not?" I experienced that some were, and still are, able to do so. Louis Schultz once stated, "We are all either balancers or fixers." In my opinion, a Rolfing instructor helps students most if he opens both avenues for them, then the young Rolfer has a choice. If s/he learns only one dimension of the work, s/he has no choice and will face difficulties making a living.

Occasionally I work with people who had sessions with Ida Rolf. They report that they felt her work had these two dimensions: She would take any opportunity to work with people with serious problems who were seeking help from manual medicine – ask Jim Asher about the story of the woman and the iron lung! And Ida Rolf worked under the license of her son, Richard Demmerle DC.

I learned from my first experience of this work: the reality of Rolfing SI is not so much what we intend it to be, it is much more what the client experiences. And as soon as the client finds a way out of dysfunction and pain, it will be easier to follow a process of global alignment and balance and free movement.

Of course there is the question of licenses and insurance. We have to wait to see what comes out of the involvement of Rolfing SI in healthcare, if something ever happens. Let's see what the Swiss are able to accomplish by making Rolfing SI a part of the recognized complementary medicine scene. Swiss watches still seem to work pretty well!

#### Peter Schwind Advanced Rolfing Instructor

**A:** In Switzerland there are two organizations – EMR (Register of Empirical Medicine) and ASCA (Swiss Foundation for Complementary Medicine) – that recognize certain therapies and certain therapists. The EMR and ASCA are each recognized by a group of different complementary health insurances that refund recognized therapies or therapists. ASCA is more present in the French part of Switzerland and approximately ten insurances work with them; EMR is present in the whole of Switzerland and around thirty-five other insurances work with them. A Rolfer needs to sign up and pay a yearly fee to both organizations (around \$600 total) if he wants his sessions to be refunded by all

complementary insurances. He can only do that if he has done a certain number of sessions already, if he has studied a minimum of 150 hours of anatomy in an approved school, and if he can prove that he is doing a minimum of three or four days of continuing education per year.

This general scenario will probably change in the future as a new *métier* is slowly taking place in Switzerland: Therapist of Complementary Medicine. There is already a course in place that allows therapists of all kinds to register to earn this designation. Our Swiss Rolwing board, and in particular our former president Marlene Sonderegger, have worked hard to have our curriculum accepted as a training in Structural Integration (Rolwing). Guild for Structural Integration practitioners are recognized as well, so to be more precise, structural integration is recognized and Rolwing Structural Integration is a brand. In our Swiss Association, we have both Rolfers and Guild Practitioners. Further down the line, schools for this new *métier* will be created. A few exist already. In such schools, there are two years of common-core studies in which anatomy, physiology, psychology, etc. are taught. Then there is another year of study for the particular method the therapist is working with (there is a minimum of hours, and Rolwing SI meets the criteria). This Swiss initiative has been recognized as a possible future project for recognition of complementary therapists in different European countries over the long term. We are not there yet.

**France Hatt-Arnold  
Rolwing Instructor  
Rolf Movement Instructor**

**A:** I have been practicing Rolwing SI for more than forty-five years. During that time I lived in Northern New Mexico, and for the past six years in the heart of Los Angeles. I have never advertised my services, and did not have a website until I came to LA. All of my business has come to me by word-of-mouth referrals: that is the means where one person I have served well tells friends and family, and this grows a reputation. I have also ridden the wave of awareness of Rolwing SI as a useful adjunct to other means of healthcare.

Rolwing SI's fortunes have risen and fallen with changes in the culture. Starting with Ida Rolf herself, treating one person at a time, and then teaching small groups of other interested professionals in parallel

lines of work, like chiropractors, osteopaths, and related disciplines. By now thousands of people have benefitted from Rolwing SI, but we have never been able to breach that magical area of 'third-party payments'. We have accomplished some research to demonstrate that our ideas are valid, and done some clinical research to show that what we do helps some people, but it has not been enough to get the recognition of the value of Rolwing SI.

Rolf took an important position regarding her work. She insisted that we did not fix anything. She insisted that gravity was the therapist. She carefully avoided ever claiming that Rolwing SI was any kind of practice of medicine. She insisted that it was a process of manipulation and education. She even went so far as to say that if a person were interested in relieving symptoms, that they had no business being a Rolfer.

Given a public stance like that, it is no wonder that our profession has never made any headway into recognition by the establishment, or serious competition for the other professions that reach for the consumers' dollars. We have relegated ourselves to a very particular corner of the therapeutic market in which we are *not* medical, *not* therapeutic, but educational. At this point, I have to say that no third-party payers in North America pay for education. In fact, when times are harder, as they have been recently, teachers are among the first to lose their jobs.

Most people who find Rolwing SI also find that they pay for it with what is called discretionary income. That is, money not dedicated to essentials like food, gasoline, or rent. It is in this milieu that we exist. We exist on referrals, and on the good will of people we have worked with who got benefit. We exist on a tiny amount of advertising, and the very occasional sports testimonials about higher performance. Most of us do Rolwing practice to make a living, or part of a living. Very few of us practice as a hobby, or sideline.

In this period of the history of Rolwing SI, we have become part of a larger field of hands-on therapeutic practice. My website (remember, new to my time in LA) hooks Google searches with keywords embedded in my front page, like 'deep tissue', 'structural integration', 'Rolwing', 'myofascial release', 'visceral manipulation', 'craniosacral therapy'. When a potential

client searches for any of the above, Google will hook on my keywords and show my links to the client. That is how I get a good 25% of my business here in the sunny south land. Once the potential client sorts me out from the other links, and calls me, then it becomes my job to either reel him in, or send him on, depending if I think it is a good match for my work.

I almost never get referrals from the 'medical' community. That includes the docs, and chiropractors, the acupuncturists, the dentists, et al. Now and then a nurse will refer, or an occupational therapist, or a Pilates, yoga, or other non-medical worker, but almost never from the upper echelon of medical practitioners. This is reinforced by the new wave of 'evidence-based' practices, aimed at actively discrediting work like ours to the extent that they want to put us out of competition for clients' dollars. That is the same battle that Abraham Flexner prosecuted for the medical profession in 1910 (the Flexner Report), successfully putting many of the 'alternative medical schools' out of business. Make no mistake, these champions of evidence-based practice are not your friends.

Given this cultural context, my own drive is to develop skills that are useful to my community, and reliable for increasing performance, raising adaptability, alleviating suffering, and bringing referrals based on good results. I don't care about proving that Rolwing SI works to some amorphous scientific body who will eventually approve of us and admit us into the lofty realm of third-party payments. In that realm, our practices will be constantly challenged, our fees regularly reduced, and our claims denied, leaving the practitioner on the losing end. This situation is already driving many doctors out of business as they can't cope with lowered fees and fumbling bureaucrats.

I think that our school must prepare our students with a solid education that will enable them to work competently and draw people to them who need them. Rather than struggle to gain acceptance from other professionals who have no interest in opening their doors to us, we should concentrate on proving to ourselves what works and what does not, and developing the work so that we can serve the communities that we live in. I think we are more related to folk healers than medical practitioners, and we should strive to be very good at that.



Six years ago I moved to LA and had the very unpleasant experience of building a business from scratch. I discovered that the high recognition that Roling SI enjoyed in the 1970s had given away to questions like “Are they still doing that?” It took me a year and a half to do a full weeks’ work – this in spite of having a pretty well-established personal reputation in the field. From this perspective, I think that the Rolf Institute needs to concentrate on producing graduates who can deliver the work across a spectrum of clients. We need to concentrate on the development of solid skills, and good understanding of structure. We need to also teach our grads how to speak about the work, and how to listen to clients’ anecdotal accounts of their state and make sense of it. We need to teach our grads how to listen with their hands, and their hearts, because when people are paying out of pocket, they also need to feel heard and recognized.

**Jan Sultan**  
Advanced Roling Instructor

**A:** I will address the two parts I see in this question. The first is “*more clients seek our assistance for issues that relate to pain and various health conditions.*” The great majority of my clients come for Roling sessions because they have a ‘problem’ related to a lack in their health, pain that bothers them, discomfort more or less all day long. Very few clients come to improve their posture. Almost no one comes for personal development in these past decades. So, yes, I constantly face clients’ requests to reduce their pain. What they discover during the Roling sessions is a broader field – that involves many aspects of their lives – that needs to be looked at and addressed. This could range from lifestyle to specific coordination and repetitive movement patterns to fixed attitudes in their behavior and worldview that reflect in rigidity in their facial web. What I do is working the fascial net.

Next, you ask if I have been “*engaged or interfaced with the healthcare system, and how have you done so while maintaining the integrity and identity of our work?*” **Yes**, I have interfaced with several medical doctors, physiotherapists, and osteopaths, and their responses have been very different. Some doctors simply deny that Roling SI could be of any help, and have no recognition of the value of our work simply because it is not formalized by a degree recognized by the healthcare system. Other doctors are totally enthusiastic and had send

clients. Pediatricians suggest Roling SI for scoliosis for instance, because they noticed remarkable improvement in patients after Roling sessions. Medical doctors who have come for Roling sessions themselves have no resistance to suggesting it to their patients.

I myself never feel obligated to adapt the principles of our work to a request that comes from rules written by the healthcare system. Clients come for sessions of their own volition, decision, and wish to improve their wellbeing.

**Pierpaola Volpones**  
Roling Instructor  
Rolf Movement Instructor

## Biotensegrity

### *An Interview with Stephen Levin, MD*

**By Brooke Thomas, Certified Rolfer™ and Stephen Levin, MD**

*Editor’s Note: This interview was originally done for Brooke Thomas’s The Liberated Body Podcast. You can listen to this interview at [www.liberatedbody.com/stephen-levin-lbp-035](http://www.liberatedbody.com/stephen-levin-lbp-035).*

**Brooke Thomas:** For those unacquainted, can you give us a simple nutshell definition of *biotensegrity*?

**Stephen Levin:** *Tensegrity* is a word derived from tension and integrity, [it] is a Buckminster Fuller term to indicate a continuous tension network. It’s actually more than that: it’s the compression elements of the structure meshed within the tension elements so that the compression elements, the rods, the skeleton, do not press on one another. It was derived from Kenneth Snelson’s sculpture [Needle Tower; see Resources at the end of the article for a link to images], actually. Snelson was a student of Fuller, but it was Snelson who really made the first structure. He describes it as a closed structural system composed of three or more compression struts within a network of tension tendons. He says the compression rods float within this structure and they press outwardly against the tension member so it’s a self-contained unit, and it’s a pre-stressed tension and compression unit. *Tensegrity* as a word had lost its meaning, so we put *bio* in front of it, which is adding biology to it, and it’s really more narrowly defined and more specific than using *tensegrity*, which everybody uses for everything else. You can get away with things in *tensegrity* that you just can’t get away with in *biotensegrity*, because life forms have their laws that they have to stick to.

**BT:** The difference between the mechanics of a bicycle wheel as opposed to a wagon wheel is a nice illustration of how we are



Stephen Levin



Brooke Thomas

pre-stressed. Can you talk about that a little bit?

**SL:** Aside from the Snelson sculptures, the closest you get to *tensegrity* in everyday



life is a bicycle wheel, where the hub is suspended in the middle of a tension network of spokes. All your spokes are always under tension. In a wagon wheel, each spoke bears the full weight of the wagon, of course divided by the number of wheels you got on the ground. Each spoke bears the full weight and you actually are vaulting from one compression pillar of the spoke to another compression pillar of the spoke.

A bicycle wheel works the opposite. All the spokes are working all the time. When you set a bicycle wheel, you tighten all the spokes, you pre-tension them, and then it stays that way even when you ride on the bicycle. Your load is distributed through the tension elements of the spokes. All the spokes are pulling on the hub all the time. It's by the opposite pulling of the spokes that the hub stays in place. It's like if you were doing tug of war and you had equal sides and the rope wasn't going anyplace – staying right in the middle because it's equally pulled on both sides. Just as the spokes in that bike wheel are pre-stressed, all the tissues in the body are pre-stressed. They are always under tension. So muscles are never programmed lax: there's always muscle tone present. All the fascia and connective tissue, in fact all collagen, have intrinsic tension within them. Even under deepest anesthesia, when you cut muscle it retracts and pulls apart. There's always tone to muscle, and you can never say your muscle is completely 'off'.

**BT:** I think that's a beautiful illustration. Speaking of visuals, you say that tensegrity structures are ubiquitous in nature if you know what to look for. Can you give some examples of what we might be able to notice if we do know what we're looking for?

**SL:** There are no true man-made tensegrities because even a man-made tensegrity structure itself uses linear materials, the regular materials people build with. Tensegrities in themselves are nonlinear, and we'll probably talk about that later. They're ubiquitous in nature; it's just recognizing them. Most of the obvious ones look like the Buckminster Fuller geodesic domes, like the Disney Epcot Center. Those can all be built as tensegrities. My favorite one is the dandelion puffball because that was a large structure that I recognized as being consistent with a tensegrity. The concept has been around for a long time. Icosahedrons were described in the mid-1960s. I think it was in the lymphocytes

and red blood cells, pollen grains, when you get down to the little things, but if you start looking at bigger things, things like raspberries and similar fruits and berries, puffer fish. In fact, most round spiky things are pretty obvious tensegrities when you look at them. Tensegrities actually can be recognized more from the mechanics of the structure than outward appearance.

**BT:** That makes sense. On the opposite side of the spectrum, bioengineers oftentimes will say human bodies are like skyscrapers. What are some of the many ways that we are not like skyscrapers?

**SL:** Tensegrities are built up from smaller units. In biology, the subunit, the cell of the tensegrity structure, is the icosahedron, which is a polyhedron with twenty triangular faces. Triangles are the only structures that are inherently stable with flexible hinges. [Tensegrity] structures can have any outward appearance, from spheres to towers with limbs sticking out. It doesn't make any difference. They're all self-contained entities. They don't require gravity to hold them together.

Skyscrapers and towers need gravity to hold them together. The bottom bricks are held in place by the bricks above them, one on top of the other. When you build a skyscraper, the base has to be bigger and stronger and stiffer than the top, and if you tilt the tower over it not only will fall over, but it will pull itself apart because of the intrinsic shear forces that develop. If you build biotensegrities, they really join together like bubbles in a foam and they can share walls and structural continuity.

If you go back to towers, I lived in the Washington, DC area, and the classic model might be the Washington Monument, which is 550 feet tall, thirty feet thick at the base, and five feet thick at the summit. It's built stone on stone on stone held together with rigid mortar. The Washington Monument was almost toppled in an earthquake a couple of years ago. It got shaken up and got cracked because it has no flexibility in it. Trees on the other hand are broader at the top. They have much more weight at the top than the bottom. They withstand big winds, and they're sort of built upside down from a Newtonian concept.

If you stop and think about animals – including ourselves – we have small and light bones in our feet. We actually stand on two little sesamoid bones under the first metatarsal, a little thing at the fifth

metatarsal, and the heel bone, the calcaneus, which is as soft as eggshells. So we stand on our calcanei and of course we often have dense heads that put a lot of load on these structures. We're built upside down. We don't make sense in a Newtonian concept. All biological structures also have flexible joints, and we are omnidirectional. We don't break apart when we're turned upside down and shaken.

**BT:** I like how you mention that we don't need gravity to hold us together. When we have people who go into space, or even just diving in different pressures under water and things like that, we don't come apart.

**SL:** It's one of the characteristics of the tensegrity structure that it is independent of these outside forces. It holds itself by internal forces.

**BT:** And the foam, the soap bubbles, is a really nice example too because that's something we can interact with pretty regularly.

**SL:** We essentially are foams.

**BT:** You had mentioned the icosahedron, which is pretty important I think to the concept of tensegrity. Can we break that down a little bit more? Why we should care about this structure?

**SL:** When I started doing this, I tried to find some structure that looked like a cell and that would build from a cell. The icosahedron is one of the Platonic solids, going way back. It's a fully triangulated structure. Again, only triangles are inherently stable, so if you're going to have flexible hinges, you have to be triangulated. It's omnidirectional so that you can turn in any direction. It has the largest volume for surface area, so it's energetically efficient in the sense of using materials that are most economical. It can be close-packed to fill space or would fill spaces like cellular space filling. It joins together. When it joins together, it'll share structures. It's like sharing the faces in the bubble, as we pointed out. The individual icosahedrons can actually then function as one unit structurally, but [the whole] also has the ability to function as the individual unit. They become independent and interdependent at the same time. It can have an external or internal skeleton. You can internalize the compression elements instead of keeping them in the outside shell, and that internal creation is a self-emerging property that comes from the structure itself. It also has mechanical properties that are nonlinear, viscoelastic, which is the

same as biologic materials, so why wouldn't you use it?

**BT:** Can you describe viscoelasticity a bit more?

**SL:** 'Viscoelastic' suggests the material property has some qualities of a liquid, the viscous part, which is liquid, and some qualities of a so-called solid part, the elastic part. 'Elastic' just means that the form can return to its previous shape. Rubber-band elastic is not a really good elastic. When you apply the term 'viscoelastic' to biologic material, it's really a misnomer. Biologic materials are not hard matter; they're all condensed soft matter, or just simply soft matter. As a class of behavior, the hard-materials side has been described as viscoelastic, but it's really a breed of its own.

The best examples I can give you of this are Silly Putty and the green slime that kids play with. Silly Putty is a polymer, it's a mixture of things. Sometimes it's rigid, sometimes it's soft. You can bounce it. You can do all sorts of different things with it, and it behaves differently the different ways you load it – it depends on the rate of loading, the surface area, the temperature. By temperature, I mean only a few degrees. We operate in a very few degrees. Steel, you need to really get it hot to change its shape. Biologic things have very slight temperature changes where they can do different things. The Silly Putty and the biologic density can be malleable, brittle, elastic, all these things at the same time.

Soft-matter physics is the science of gels, foams, emulsions. Some composite mixtures like cornstarch in water will show these kind of behaviors. The Oxford University lab [The Oxford Centre for Soft and Biological Matter] actually has on its website, "Biology is soft matter come alive," that's a quote right off the website. If you think of foam as behaving like Silly Putty, as it probably does, we have all these properties built into the viscoelasticity and the characters of biologic tissues. All the structures in biology behave the same as icosahedrons do, which have this viscoelastic property, which really isn't that, it's soft-tissue mechanics.

**BT:** You mentioned cornstarch and water. We use that at the Rolf Institute® just to get a tangible sense for viscoelasticity, and it's really fun if you mix up a tray of it because if you touch it hard and fast, like with really pointed fingers, it just firms up like a wall and kind of pushes you away. If

you touch it slow and broad, your fingers will sink in. And then getting your fingers out, if you pull real quick, it'll keep you in there. It's really cool to play with that quality with touch and to get a sense for how responsive it is.

**SL:** I frequently use the example that when you pull on your lip or your earlobe, it'll first give easily and then it stiffens up. It's not a linear stiffening up where you get an incremental point-by-point change. It actually gets structurally stiffer in many ways. The harder you pull, the stiffer it gets. Silly Putty gets stiffer the harder you pull on it or the faster you pull on it.

If you look at things like fascia for instance, then you're right: as you play with it, the fascia does that. If you attack a body and push on it hard, it's going to resist you. You'll never get into its deeper layers. If you just sort of lean on it and move into it slowly, you'll get into the deeper tissues of it, and that's very typical of these kinds of things. If you think of Silly Putty or those slimy gel things, you'll see that's exactly the way they work. Look at something like the heel pad, for instance. You run on your heel pad, and every time you hit it hard it protects you; when you walk on it, it gives you a soft, gentler kind of response and more of a shock absorber; and if you touch it, you can just sort of sink your finger into it. It's the same material. It's the rate of loading that makes the difference.

**BT:** You mentioned how delicate a structure our calcaneus is, and that this model of us like skyscrapers just doesn't hold up. If we were loading our calcanei that way with all the force of everything else piling down on top, they wouldn't last us very long.

**SL:** The calcaneus is really very soft bone. In surgery, you can actually just poke at it and it'll break. One of our problems is that when you take these things out of the body and let them dry out, they become stiff and hard, and you're not dealing with them under normal test conditions that the body uses. If you're testing things at room temperature, well the body doesn't operate at room temperature. It operates at body temperature. Take a thing like petroleum jelly, you keep it at room temperature and it's a thick jelly; you put it on your skin, it just slides all over the place. You have to now think, how are these people testing these materials outside the body? If you're not testing it at room temperature and

[instead] using body conditions, then you get completely different results.

**BT:** That makes perfect sense. You have pointed out that in the traditional paradigm of Newtonian biomechanics, "The forces needed for a grandfather to lift his three-year-old grandchild would crush his spine, or touching a fish at the end of a fly rod would tear the angler from limb to limb." I think these are some good examples about how this Newtonian model doesn't really hold up to how we actually use our bodies.

**SL:** Rather than go through the math with you – it's difficult without a blackboard – let me point out that the Newtonian biomechanics calculation of spinal loading and joint muscle loading are based on a 350-year-old model that assumes 1) biologic material is hard matter, and we just discussed that it is not, we now know it's more like Silly Putty; 2) that muscles act as binaries [and] they're on and off, but we've already said that muscles are always on, there's always tone in muscles; 3) that the muscles act as agonists and antagonists, when they mostly act synergistically; 4) that the muscular system is an open kinematic chain system, when we know that much, if not all, of muscular skeletal mechanics is really closed kinematic chains (we move one thing and something moves at the other end of this chain). You also understand that muscles are internal forces and can't resist external forces without external help. They're using the calculation as if the internal muscles can resist gravitational forces, and they cannot. You can go through all this, and I don't have to use calculations or any math. I can just talk about this and say, "Hey, they're using the wrong model. You got to start over again."

**BT:** Perfectly said. We dipped into this a teensy bit, but going back to it, biologic systems are pretty invested in using the least energy expenditure necessary. What are some of the ways we've developed to use the least energy needed?

**SL:** I'm old enough to been in the Army, and the Army maxim was, "Never stand when you can sit. Never sit when you can lie down. Never stay awake when you can be asleep" – and that applies to biologic systems. A nonlinear stress-strain curve is initially flat. It just sort of flows along and then starts getting steeper, stiffer, and stronger. The biologic system always wants to operate at the least-energy point, at the low part of the curve, because as you

increase that strain and it gets stiffer, you need much more energy. It's interesting that in the laboratory, most of the testing is done on the steep part of the curve and they sort of ignore the bottom part because the math there is very difficult.

**BT:** That's interesting to know. Diving into one structure in particular here, the shoulder is one of the least successfully modeled joint complexes using Newtonian mechanics, and you have a great paper on this, which I'll put in the notes. It's titled "The Scapula is a Sesamoid Bone." I love that image. Can you briefly touch on what a sesamoid bone is and how the scapula functions as one?

**SL:** The sesamoid bones are those bones considered outside the axial skeleton that don't contribute to direct support of the body (of course they're thinking of a body that has a column of bones), and the most common one that everybody knows about is the patella, the kneecap that sort of floats outside the knee and is buried within the tendon of the quadriceps muscle. There are others. One you don't think about very often is the hyoid bone in your neck where your voice box is. That's sort of sitting in space not supporting anything. Of course there are supporting sesamoids, but not thought of that way: the two little sesamoid bones underneath the first metatarsal. These bones are about the size of small peas, and they crush easily. They are like peanut shells, they crush very easily, and they're sitting there, and you'd expect them to get all this crushing force. They're sitting in tendons, and those tendons act like leaf springs on a car and actually keep you from striking the bottom. If those little sesamoids got hit by the first metatarsal, they'd be crushed – like hammering against an anvil.

I looked at the scapula, it sits there and floats on the chest wall. There's no direct loading between the scapulae and the chest wall, [they are] buried in muscles. The scapula fits the definition of a sesamoid. Of course, I take it a bit further, and I say that in the biotensegrity model all bones float because that's a definition of tensegrity, and therefore all bones are sesamoid bones.

**BT:** With the scapula, we'll think about that continuity with the clavicle, but that doesn't mean that it's not floating just because it has that bone nearby.

**SL:** If you look at the clavicle, it's also floating up there. It's only hinged to the sternum by a little ligament there at its joint,

and of course the chest wall is moving up and down sixteen times a minute through these flexible ribs, so there's no way you can pass a load through the chest to the axial spine.

**BT:** Thank you for that description of the float of the scapula and the float of everything. You've been working in the biotensegrity field for a long time and you've contributed a lot of wisdom in this field. Is there anything that you're currently really fascinated by in your own work?

**SL:** Actually this year is my fortieth year working in biotensegrity. My original concept was sort of a eureka moment forty years ago: I was sitting outside the National Museum of Natural History in Washington, D.C. contemplating the skeletons of dinosaurs when I recognized Snelson's sculpture across the lawn. (The Hirshhorn Museum with his sculpture is directly across from the National Museum of Natural History.) I put the two together and then started building from there. Since then, I have been working on this concept and trying to figure out how these two mesh together. The most recent things I've been working on have been soft-matter physics and the closed-kinematic-chain mechanisms, which are how these structures move and how they behave under different forces, which completely gets you away from the hard-matter physics that is the staple of present-day biomechanics.

**BT:** That was a really fortuitous day to see those two things together.

**SL:** The Hirshhorn Museum [had] opened a year before and I had gone down and walked around and couldn't figure out how this structure [the sculpture] stood there. I just left it at that. A year later, sitting across the Mall, I said, "Oh my god, the two of them [the sculpture and the dinosaur skeleton] match." I went across and then figured it out from there, and then it took me a long time to figure out how to build the tensegrity. I called Snelson and got hold of Buckminster Fuller people and did all sorts of things to finally figure it all out and get down to the icosahedron and then work back up from there.

**BT:** That's wonderful. Those giant dinosaurs couldn't have existed with the structural skyscraper model.

**SL:** Absolutely not. There's no way that they could have functioned in any way but

a tensegrity concept. More than anything else, the *Diplodocus* had a tail that was over 100 bones long and was held up in the air. It didn't drag on the ground. It used to whip it around. There's no way that that could have functioned unless it was in a tensegrity structure. The muscles are adjacent to the bone; there's no lever that you can possibly make out of it, so it has to function as a tensegrity.

**BT:** My son went through a very intense dinosaur period for a long time, so I'm pretty well versed. Because the tails were so long on these skeletons they were finding, they just always assumed that the tail dragged on the ground (and assembled the skeletons that way), until they finally realized they'd never found a fossil with a tail drag.

**SL:** Exactly. That was my professor. I was trained by the head of the paleontology group over there, and he used to say, "In the sands of time there are footprints but no tail tracks."

**BT:** Which means we have to think of these things totally differently than we have. Thank you so much for all of the amazing work that you have been doing and for talking with us today.

**SL:** It has been my delight. Thank you very much.

*Brooke Thomas is a Certified Rolfer who has been practicing for over fifteen years. A self-admitted body nerd, she teaches movement and hosts The Liberated Body Podcast as a continuing-education resource for those in the manual and movement therapy fields. Visit [www.liberatedbody.com](http://www.liberatedbody.com) for more episodes, or visit [www.newhavenrolfing.com](http://www.newhavenrolfing.com) for more information about Brooke and her practice.*

*Dr. Stephen Levin originated the concept of biotensegrity more than forty years ago. He originally trained as an orthopedic and spine surgeon and was formerly Clinical Associate Professor at Michigan State University and Howard University. He studied general systems theory with noted biologist Timothy Allen, and now, retired from clinical practice, considers himself a 'systems biologist'. He has been closely allied with others working in the field of design science, emphasizing the work of Buckminster Fuller and its applications. He has written numerous papers that contribute to the understanding of how biological structures function like tensegrity structures.*



## Resources / References

Stephen Levin:  
<http://biotensegrity.com>.

The Levin Biotensegrity Archive:  
<http://biotensegrityarchive.org>.

The Buckminster Fuller Institute:  
<http://bfi.org>.

Kenneth Snelson's Needle Tower sculpture: [https://en.wikipedia.org/wiki/Needle\\_Tower](https://en.wikipedia.org/wiki/Needle_Tower) [www.smithsonianmag.com/smithsonian-institution/how-does-hirshhorn-60-foot-needle-tower-stay-upright-in-stiff-wind-180953391/?no-ist](http://www.smithsonianmag.com/smithsonian-institution/how-does-hirshhorn-60-foot-needle-tower-stay-upright-in-stiff-wind-180953391/?no-ist) (the latter includes a video of its installation).

## Articles:

"The Scapula Is a Sesamoid Bone":  
[www.biotensegrity.com/resources/scapula-sesamoid-bone.pdf](http://www.biotensegrity.com/resources/scapula-sesamoid-bone.pdf).

"Tensegrity: The New Biomechanics":  
[www.biotensegrity.com/resources/tensegrity--the-new-biomechanics.pdf](http://www.biotensegrity.com/resources/tensegrity--the-new-biomechanics.pdf).

# A New Paradigm of Anatomy

## An Interview with John Sharkey

By Brooke Thomas, Certified Rolfer™ and John Sharkey MSc, Clinical Anatomist

*Editor's Note: This interview was originally done for Brooke Thomas's The Liberated Body Podcast. It has been edited slightly for length. You can listen to the interview at [www.liberatedbody.com/john-sharkey-lbp-055/](http://www.liberatedbody.com/john-sharkey-lbp-055/).*

**Brooke Thomas:** Today, I'm talking with John Sharkey who is a clinical anatomist, exercise physiologist, and European neuromuscular therapist. He's developed the world's only master's degree in neuromuscular therapy, which is accredited by the University of Chester (UK). He's on the editorial boards of the *Journal of Bodywork and Movement Therapies*, *International Journal of Osteopathy*, and *International Journal of Therapeutic Massage and Bodywork*. He's also a member of the Olympic Council's medical team and a founding member of the BIG, otherwise known as the Biotensegrity Interest Group. He has also authored or co-authored several books including the third edition of *The Concise Book of Muscles*.

He and I are talking here in great depth about the old paradigm of anatomy and biomechanics and what the new paradigm holds. This is really critical stuff. I believe we're on the brink of a new understanding of the living human body. We have a lot of fascinating people doing groundbreaking work in this field and it's time to look at our old models; to look at where they come from and why they're outdated.

If you're interested in things like living tissue versus formaldehyde-treated cadavers, biotensegrity versus biomechanics, continuity of form versus origin-insertion, and just how individual human anatomy is and what that changes about our often dogmatic approaches to the body, then this interview should be a treat for you. Thank you so much John, for talking with all of us today.

**John Sharkey:** It's a real thrill to be here.

**BT:** I want to start off with some of your background. I introduced you so people have a sense of your bio, but the one thing I really want to pick out for this conversation is that you're a clinical anatomist; I want people to have an understanding of what that means. Could you describe the way



John Sharkey



Brooke Thomas

clinical anatomists earn their stripes, so to speak?

**JS:** First of all, I'm going to take you back to the mid 70s and then into the late 70s and early 80s. The health fitness industry hadn't really started yet and I was into running. I just didn't know at the time that it was called 'running'. I used to just run from one end of the beach to another with my brother, and the game was really to get from one end of the beach to the other, that's it. Then that later became known, thanks to Jim Fixx, as 'jogging', as 'running'. I was also lucky enough to meet a group of ladies who were looking for somebody [to] practice their

massage techniques on. I offered my body and so I had one person on each foot and one on each hand, somebody massaging my head, and somebody else on my body.

I said, "What's all this about?" That was my introduction to massage and bodywork therapy, and over the years as I read more articles and got to listen to some of the leaders at the time, I became more aware that there was a big disparity between the medical fraternity and the massage people. In the United States there were people like the structural integrators and so on, but it really hadn't developed very well over here in Europe yet. I made the decision that physiology and anatomy were going to be the foundation stones upon which I was built. I went into formal studies and gained my undergraduate degrees and then went on to do my postgraduate degrees in both exercise physiology and in clinical anatomy.

[So you posed the question,] "What exactly does the clinical anatomist do?" You're probably aware that my alma mater is Dundee University in Scotland. In Dundee University the department that we work in is called the Department of Anatomy and Human Identification. Anatomy spawns quite a broad spectrum of speciality. For instance, one of my heroes is Professor Sue Black who is the head of the department. Sue [was] involved in several legal claims against individuals who had committed crimes against children, [producing] evidence to demonstrate that this was the person who perpetrated that particular crime. Also, she was involved in returning bodies to families after [wars], for example in Bosnia, and this was through human identification. That's one aspect of speciality in anatomy.

My speciality is clinical anatomy, and in clinical anatomy, it's really all about *where*. Where is the phrenic nerve? Where is the superior mesenteric artery? Not just about where but, basically, what is its path? What structures lie close to it? In the case of the superior mesenteric artery, it begins at the distal part of the first lumbar vertebra. Then people are interested in specifics, so they want to know that it is one centimeter lateral of the celiac trunk or something to that effect, and that's because part of our job is to inform surgeons – e.g., where the nerves are, and also in what percentage of the population would you find them perhaps one centimeter lateral or one centimeter medial and so on. It's to do with that type

of specificity. Anatomists really feed on technicalities and on detail.

**BT:** [So] clinical anatomy is about *where* and it's about knowing the names of structures that have been passed down through the ages. Really you're very much steeped initially in what I'm now calling, and many people are now calling, the old paradigm – this idea of parts, naming parts. [And] you are such a champion for the new paradigm as well. You're running the world's first biotensegrity dissections. You've been writing articles with really compelling titles like "Fascia and the Fallacy of Biomechanics." These are big things. I'm curious, do you agree first of all with these terms – old paradigm, new paradigm – and if so, how might you differentiate them?

**JS:** Yes, I absolutely do, and I also realize that I'm not alone. There are many individuals on this path, and that's really what took me into the path of Dr. Stephen Levin, [who] was investigating this biotensegrity model. When you're investigating and somebody else is investigating, it takes you perhaps to a common ground. Over twenty, twenty-five years ago, Dr. Levin [and I] met. We started to communicate and we began to exchange thoughts and ideas; and of course Stephen has a number of years in life on me, and so he was well ahead of the curve. [Editor's note: Brooke Thomas' interview with Stephen Levin appears on page 6.]

Even if I'd never met Stephen and if I'd never come across this term *biotensegrity*, my own experiences were leading me [in that direction]. In clinical anatomy what typically happens is that [new students] are given a textbook, this could be *Gray's Dissector*, and they open it up and it will immediately begin to tell them how to carry out the dissection. Every student follows the guidelines in whatever textbook of choice the university uses, I'm just using *Gray's Dissector* as an example. They follow the dissection descriptions and carry out those dissections the same way that the previous students a year earlier carried out the dissection. The same way students a year earlier carried out the dissection, and in fact the same way students from perhaps the last several hundred years have carried out these dissections. From that viewpoint, the dissection has always been the same. What tends to happen is that in anatomy they want to get through the skin, through the subcutaneous, and get down to the structures that 'really matter' the most – the

nerves and the blood vessels and perhaps then the viscera and the musculature.

That really is a focus of parts and the language of parts, while I was really interested in exploring the language of wholes. I wanted to appreciate the relationships and the continuity. In many ways you are not even given the opportunity to do that, because as a student, you're usually at a table with five other students. You can't really dictate to them and say, "Oh, hang on guys. Let's not destroy this until I get to have a look at it." In the department of anatomy, my nickname was Fascia Man because I had an interest in fascia, and in fact one of my colleagues who works with me on the biotensegrity-focused dissections (he went on to do his PhD and so he is now a doctor of anatomy) still calls me Fascia Man because he remembers the nickname. Every time I'm in the dissection room, they introduce me as Fascia Man. It's lived with me because it was so unusual for them – "Oh, you're the guy who talks about continuity. You're the guy who talks about fascia."

That's what really intrigued me, and that's what led me to meet with Dr. Stephen Levin. I'm so lucky, Brooke, and this is a big reflection of Dr. Levin's spirit and of the kind of man he is. We established what's called the BIG group; the Biotensegrity Interest Group. We meet every year and there is no fee for these meetings; it's just a group of interested persons arriving and sharing their information. People like Robert Schleip and others have been at these meetings. That's just amazing that you get to meet and speak with some of these people and you don't actually have to pay for it. That's really informed me over the years.

**BT:** Could you define biotensegrity in the way that you think of it.

**JS:** Sure. I'm sure that many of your listeners will understand what tensegrity means; 'tensegrity' of course is basically a compression of the words tension and integrity. This word was brought to us by the engineer Buckminster Fuller, and so this really relates to some of matter – the construction of buildings, of bridges – which requires nuts and bolts and screws, etc. This is also the language that's used in biomechanics. However, biotensegrity refers to living tissue.

People often use a particular toy from The Manhattan Toy Company called Skwish™

to explain the principles of tensegrity. What you have basically are wooden struts with an elasticated band that runs throughout the structure. The wooden struts don't touch each other, they're kept apart by the tensional aspect from the bands. While this can be used as a visual aid to discuss tensegrity, it's also an enemy to me because the very materials that this little toy is made of are the wrong materials. We are not made of wooden struts and we do not have elasticated bands. For me, Brooke, words are hugely important and I fully understand that there will be people who say, "John Sharkey is just making a big thing out of nothing."

Human tissue is not supposed to be stretched – and take this with a pinch of salt because I'll have to put it into context, but human tissue does not stretch. We can see that for instance in skin. If somebody has been heavier and then lost weight, we see stretch marks [on the skin] because the integrity of that structure has been compromised. Now it's not that I'm saying to people, "Don't do what you have been doing all along." What I'm saying basically is that, "What you think you have been doing and what you are actually doing are possibly two different things." I would like to see a discussion regarding the vocabulary, and perhaps changing this word 'stretch'. In a discussion I was having with a colleague, he was talking about stretchy material in the pelvis. That's where the whole problem is, once the tissues in the pelvis have stretched, they will not return to their former states.

This is one of the things that is so important in terms of bodywork and movement therapy, because there are many people who spend hours stretching. Gymnasts are known to lie on their backs, place their bottoms against a wall, let their legs abduct, and then take either a magazine or a book and lie there and read for half an hour or an hour. The question you've got to ask yourself is, how are they achieving this range of motion, this new additional range of motion? Now I don't like the terms 'origins' and 'insertions' in terms of biotensegrity, but I think that's a language of convenience that we can use. It's not that we want to take the origin and insertion any further away. We're trying to change those tissues that lie between the origins and insertions, perhaps maybe the more contractile tissues, the fibers, or perhaps those tissues that can become a little bit

buggy and sticky and cause 'adhesion' (this is another word I don't like).

Dr. Jean-Claude Guimberteau will be joining me this summer at the pre-conference day for the British Fascia Symposium. In Guimberteau's videos, he uses the word 'sliding'. Place one hand on top of the other and then move your hand back and forward, and you feel heat, a consequence of the friction: this would not be a good way for mother nature to build living structure. In living architecture, tissues do not slide. What they do in fact is *glide* relative to each other, and Guimberteau's videos demonstrate that beautifully. If you look at his *Strolling Under the Skin*, it's a perfect example of gliding as opposed to sliding.

When we talk about living tissue versus non-biological tissue, it's important to make that distinction because people talk about stretching in a Newtonian way. If we were to take a look at various structures (again with my clinical anatomy hat on) in a Newtonian tube – for instance, the heart or the blood vessels – the tube would lengthen and it would expand under pressure. With all that pressure, the blood vessels in the brain should also expand and squeeze the brain out through the eye sockets and the ears. This doesn't happen because of what's known as nonlinearity of the arterial walls. To me it's an important discussion, and to me language is hugely important. I'd love to see the bodywork and movement therapy worlds change the word 'stretching', or at least realize that that is not what you're trying to do. If anything, you're trying to restore physiological range of motion if [it] has been lost, but we certainly do not want to take somebody's physiological range and increase it because most likely you'd get into damaging ligaments and lengthening ligaments, and that's going to lead to a lack of stability. Lack of stability will mean that the body has to try to find stiffness and tension from somewhere in order to be able to support a joint, and that's going to come from the more contractile tissues. The muscles are experts at contracting, but also we have various fascia in the human body and they also contract, just not quite in the same way as muscle fiber. By the way, muscle fibers are fascia.

**BT:** I know. It's so important.

**JS:** Yes, and they're not to be separated from the continuity that exists. They are specialists along a continuum, and fascia can also contract. The issue and the problem

with contraction in fascia is that it could start contracting today and may not stop contracting for the next two to three years.

**BT:** I think that language is wildly important, particularly when our models of how we understand the human body are evolving; so language has to evolve alongside that too or we get stuck.

**JS:** Let's applaud that because I tend to find that people don't place enough importance on that. I believe that the image you have in your head when you come to a table to do some bodywork, and you're about to make a decision on behalf of a client, I believe that the words create images in your head, and those images inform you as to what it is you wish to achieve and how you're achieving it. If you have a false image in your mind, I think that you're going to have false expectations in terms of the therapeutic outcomes.

**BT:** Agreed, and I think that happens with dissections as well. If people start out with a drawing of a shiny red muscle against a white background as a separate piece, and then are handed a scalpel and told, "Make it look like this," they're really not paying attention to what's in front of them, they're just trying to make it look like the concept they're starting with.

**JS:** Exactly, and what we're getting there is a very antiseptic view of the human body. By the way, I don't ever want to throw the baby out with the bath water. I love the history of anatomy. The history of anatomy is quite dark because from the very earliest dissections via Alexandria (or back to the ancient Egyptians) and coming into the more modern era, the church was keeping a very close eye on scientists and anatomists. Leonardo da Vinci had to do his dissections in secret. So from that viewpoint, there is a dark history, but it's also a really interesting history. For instance, the term 'acetabulum', any idea what that might mean?

**BT:** No, I don't know. I hadn't thought of that one.

**JS:** [With] one half of the pelvis turned on its side, [it] resembled a vinegar bowl, and so the Greeks gave it the name *acetabulum* – this would be the little bowl of vinegar they would dip their breads into. The terms used in anatomy for muscles are very ordinary, simple words that really inform us what the structure does, or where it is: tibialis anterior basically tells you where it is, flexor digitorum longus tells you at least



that it flexes. That's in traditional anatomy by the way.

However, we are dealing with three-dimensionality. The tensegrity icosahedron (a polyhedron with twenty faces), which is what biotensegrity is based upon, is really multidimensional. It's definitely fourth-dimensional and it may be multidimensional, but we will never get to see that because the tensegrity icosahedron is a three-dimensional vision on earth of something that is fourth-dimensional. We don't have the capacity to be able to see it. We may be able to provide some examples using computers. This structure is what we use to show how cellular activity might conduct itself. The problem is that it's presented on earth in a three-dimensional manner.

In fact, again with my anatomist hat on, you have a right eye and you have a left eye and they are set apart on your face. The information that you take in will cause the brain some problems because the brain basically would say, "The image I'm getting from this side and the image I'm getting from that side are not correct. There seems to be a disparity here." So what the brain does is it tries to fill in the missing information. We actually see in 2D, but at best we see in what's known as pseudo 3D or 2.5D, because your brain is filling in the rest of the information. You have two images, the brain is giving you what we call depth. Think about that, that we can only see in 2.5D, but the tensegrity icosahedron operates in at least the fourth dimension if not the fifth dimension. By the way, for those people who think that the fourth dimension is time, you always have to have time because something can't exist unless you have time, so time exists in all of the dimensions. I'm not talking about time, I'm more or less talking about something like a Möbius strip, so that there's no inside and no outside and there is just continuity – and that is true of the human living architecture.

**BT:** I had never thought about that before, that we literally can't comprehend continuity because we can't really see it.

**JS:** This is why what I really want to try to do with the scientific community, with the bodywork community, is to ask people to consider the model of biotensegrity and recognize that what we are actually dealing with requires soft-matter physics. Soft-matter physics will give us the mathematical

models, to provide us then with computer graphics that will help us to explain these multidimensional dynamics.

For instance, there are colleagues of ours who are working with NASA and helping to build robots that can go to far-off places in space such as Mars, etc. They're using tensegrity principles but also biotensegrity principles. It is amazing to me that we are still working off the idea that the body is a lever-based system. For that to be the case, we would have to have screws going through the joints. If we took the knee joint, for instance, your femur and your tibia would have to overlap and there would have to be a pin joint in place. There would have to actually be a screw. To me that's one of the basic and easiest visuals. You take a look at an x-ray and you see that there's space between those bones. How can there be space when you're standing? Why are the bones not crushing each other? Why are they not compromising that space? People have this notion that there must be a lot of fluid inside the knee joint because it is a fluid-filled joint. Lick your hand. That is pretty much how much fluid you have in your knee joint. What is it that's saving and keeping the integrity of that joint space in place?

That really is where the discussion needs to go. It needs to go into a new anatomy, it's the twenty-first century, not the old biomechanics. They've tried to explain how people in a gym can lift 200 kilograms, saying things like, "It's intra-abdominal pressure." Then you have someone like Serge Gracovetsky who provides evidence that to lift a weight any heavier than fifty kilograms would require so much intra-abdominal pressure that a person would explode. We know that we can't explain how some of these long-distance migrating birds can travel 9,000 miles without cooking themselves. In other words, the amount of heat that they would generate from the muscular action of flapping their wings would cook them. Or perhaps the example that a kangaroo jumps simply because he stores energy in his tendon. Nobody is discussing the role of bone: bone is soft matter, it is not hard matter, all it is is a continuation of the fascia. [Bone] happens to be harder than ligament; ligaments tend to be tougher and a little bit harder than tendons; tendons tend to be tougher and harder than the septal tissue that acts as a partitioner; and so on up to subcutaneous tissue, which is a much softer, malleable,

pliable tissue. What you have is continuity, and speciality on the continuity.

**BT:** You recently took on a project that involved probably quite a lot of building bridges between this old paradigm and new paradigm: you co-authored the third edition of *The Concise Book of Muscles*. How do you approach a task like that? It's right there in the title, 'muscles', and you're a fascia man. What was your approach?

**JS:** Well, I have a number of titles, I write specifically for Lotus Publishing, and my publisher asked if I would take on this project. Now the problem of course is that the book is very much based upon origin-insertion, and would be very much based upon 'this muscle produces this action', but my responsibility is to create change. Now that I'm in my mid-fifties, the one thing that I realize, Brooke, is that change takes time. You won't achieve a lot of change, it might be huge within a particular context, and from that viewpoint I said, "I'm going to take on this task." I made a lot of changes to the textbook. Because it is such a popular book, many medical students use [it], so I was very aware of the responsibility that I was taking on. From that viewpoint, I was able to change quite a bit of the anatomy. It's amazing how many people think that there are only twelve cranial nerves in the human body. There are at least thirteen, and there is possibly a fourteenth. We need more research to know whether the seventh cranial nerve just simply subdivides and branches off, or if the branch is in fact a true cranial nerve on its own. The point is that this type of detail is incredibly important for undergraduate and med students and I wanted to make sure that they had the accurate information within the book. Then the other aspect was, I introduced a section that was co-authored by myself and Dr. Levin to introduce the idea of biotensegrity as the new anatomy for the twenty-first century. I suppose it's a soft introduction, and then perhaps in the next edition, I make some additional changes. Let's say in the next ten to fifteen years, if I'm still alive, the sixth and seventh editions will look very different to the current edition.

**BT:** Let's talk a little bit about the biotensegrity dissections that you're running at Dundee University in Scotland. The first was last summer, and the second is going to be at the end of June, beginning of July this summer [2016]. The first thing I'd like to address, and then we can talk about what happens there more broadly, is the

cadavers are treated with something called Thiel rather than formaldehyde. Why are you doing that and what is that?

**JS:** Over the years I realized that working with cadaveric specimens that are treated with formalin and formaldehyde changes the texture, changes the color, everything looks like a fawn color. In fact, you could have a student call me over to a table and say, “John, what’s this structure?” I might say, “Gosh, I don’t know.” You really would not know what the structure was because it looks like all the other little structures that are there. What you would have to do is follow that structure along its course and bring it back to its origin in order to be able to say, “That’s actually such and such a nerve” based upon where it has originated from and the path that it has taken. From a textural viewpoint as well, all the tissues change color.

Here’s a point I try to make: once you make an incision to skin, and you allow atmospheric air to touch what is beneath the skin, you will begin to see changes taking place. From that viewpoint, if somebody takes a piece of tissue out of the human body, and they carry out some type of investigation on that tissue, what you’re actually witnessing are emergent properties. We go back again to the amazing historical pioneering work of Dr. Guimberteau because Jean-Claude could do what no university would allow a PhD student to do. That is, he was able to get permission from his patients to place a camera under their skin. For the first time in history, we have recorded images of our connective tissue in living tissue, and it just has blown people away. It certainly blew me away. This is the type of visual evidence that I needed to be able to demonstrate (which helps me to be able to support why I say that you cannot stretch or should not be stretching tissues) that tissues glide relative to each other but they do not slide relative to each other. In fact, in Dundee in the summer, we are going to be bringing in an endoscope and we’re going to be actually using the endoscope on the Thiel cadavers.

With the Thiel soft-fix technique, the cadavers hold on to their original colors, I’m able to keep fluids moving in the arterial and veinal system, and I’m able to keep the lungs inflating and deflating. It’s a very real experience, as close to the surgeons as you possibly can get, [although] of course there is no life in the tissue. Bear in mind that when we use a tensegrity model again there is no breath in the model, there’s no nervous

system in the model, and they’re made of the wrong materials, so this is a really great opportunity for me to be able to tell people these are models that help us to put forward some type of image and to be able to talk about continuity. For instance, we might talk about the wooden struts being discontinuous and the elasticated tissues being continuous, but in a biotensegrity, that’s just not the case. In biotensegrity, the bones are simply a continuation of the fascia, so there is no discontinuous element. That is a really important piece to get across.

**BT:** It’s hugely important. I went to art school, so I’m imagining how amazing it would be if somebody could make a toy that was woven, where you could actually see the continuity of the form instead of wood and then elastic bands, but anyway that’s my aside. That’s my personal fantasy.

**JS:** Let’s just repeat that really quick because I think that that is such an important point. [Compared to a tensegrity model], in the human body there is no beginning, there is no end, there is no front, no back. There is an inside and an outside in terms of atmospheric air, but when we get down to the micro and nuclear level, we’re dealing with a different dimensional space. In fact, if somebody was to hold their thumb and first finger apart, and let’s say they took the fingers apart by an inch, that inch is infinite. We can say it’s an inch, but it in fact is infinite – and that’s science.

**BT:** Aliveness changes so much, which is why Guimberteau’s films are a huge leap forward in our understanding of the living human form. I’m curious, when you ran the dissection last summer, were there any surprises or any big *aha* moments for you in doing a biotensegrity-focused dissection with that Thiel-treated tissue?

**JS:** First of all, there are always *aha* moments. When you pick up any anatomy textbook, [it will say a] muscle comes from here to here. The truth of the matter is that the norm in human anatomy is individuality. The norm is not that we are all the same; the norm is that we are all different. Every single dissection on every single donor brings forth just amazing differences. There were several that we found. Wilbour Kelsick, a chiropractor based in Canada, called me over to the table because they were looking at the biceps femoris and its attachment. Basically it became the gastrocnemius; there was no real direct attachment down onto the

bone. It just went under a slip of connective tissue and one muscle became the other. In the textbooks you see a tendon going to a portion of the bone and attaching to it. The early anatomists got some things right, they could see that the talar was a sesamoid bone, a bone that was floating in connective tissue. In the biotensegrity model, what we can demonstrate in the dissection is that every bone is floating in the connective tissue, so every bone in the human body is a sesamoid bone.

Because of our particular approach to the dissection, we will perhaps take the skin off as one autonomous structure. We would take the subcutaneous fat as one autonomous structure so that it at least gives people the impression of continuity, of connectiveness, and that’s what the dissection also brings to people. It brings them a very strong visual image that shows the continuity, and that there is no such thing as a biceps brachii or a rectus capitis posterior minor. These are man-made terms because some person back in probably the thirteenth century put names on muscles, and they decided to make an incision on the tendinous inscription at either end and then take that up and call it a name. You ended up with your vastus medialis or your vastus lateralis. For those individuals who come to my Facebook page, I put a post up just a couple of weeks back highlighting the fact that we’ve discovered a new muscle in quadriceps. I’m not sure what we’re going to call the ‘quadriceps’ anymore.

**BT:** Wow, interesting. This focus on individuality releases us from so much of the dogma that gets passed around, not just in anatomy but also in movement. That everyone has this attaching here to here and it does this action, so everyone should be able to accomplish x, y, z.

**JS:** Absolutely, there’s no doubt about that. It doesn’t necessarily mean that somebody is going to be restricted. They may need some adaptation. What’s really interesting is I’ll often have students take out a whole range of femurs and pelvises and give them some cloth measuring tapes. They will measure the diaphysis and the epiphysis, they will measure the neck, they’ll measure the head, they can measure the depth of the acetabulum, the hip joint . . . and when they come back they will find that none of the measurements are similar in any of the bones that they were given. For me at least, it translates into the fact that there is no one squat that suits all or fits all. You really

have to work with people as individuals, and when you can see that in the anatomy department, it really drives that point home that we shouldn't be expecting that everybody can do the same thing the same way.

**BT:** Wonderful. With this shift that we're making, this evolving into a new paradigm of understanding the body, what is it leading us towards? What are some changes in approach or intervention that might be born of understanding a more biotensegrity model of the body?

**JS:** First of all in terms of anatomy, we tend to look at the connective tissues from both an embryology viewpoint and from a phylogeny viewpoint. In other words, if we take a look at the human body, there's nothing perfect about our anatomy or our neurology. If I were to make the human eyeball, I think I would make it differently to what we currently have. If we were to take a look at the path of certain nerves, particularly cranial nerves, you might be forgiven to think that cranial nerves would come out of the skull close to where their terminal destiny is, and that's just not true. These nerves take torturous routes, circuitous routes, to get to where they need to go, and you think, "Hang on a second, what does that mean?"

What that means, basically, is that as these nerves are going from the brain to their terminal structures, they will have many branches off the mother nerve. Remember these all have continuity with the connective tissue. In surgeries it is referred to as the 'passenger'. It could be for instance, the uterus or it could be some other structure that we're looking at, the nerve structure. They are simply the passengers that are being supported by the connective tissue. If your focus is on doing something with just the passenger and you think you can just stitch the passenger against something that'll hold it in place, that is completely wrong. Believe it or not, that is what is happening in many surgeries at the moment, where a surgeon will take up lax tissue and stitch it perhaps to a particular ligament. In nature, that tissue was never attached to that particular ligament, but they think that they're offering integrity where in fact what they need to do is to go in and recognize where the true insults in the soft tissue are and repair only those soft-tissue insults. It really means that we need to be more respectful to the wrapping, to the tissue that roams through and around

and over and above. This changes the way in which orthopedic surgeons will approach surgery.

From a movement and bodywork viewpoint, biotensegrity is an amazing model for demonstrating to individuals that if you have a pain and problem in your shoulder, I would say that a good 85% of the time if not 90% of the time, your problem is not your shoulder. Your shoulder is making a noise, it's screaming and shouting for attention, but it is going to be a problem that is perhaps lower down the kinetic chain. I don't want to jump into conclusions, but bear in mind that the real motors for movement up in the shoulder come from the lower limbs. Your shoulder musculature is really about dexterity, it's really about fine tuning and doing rotations, twists. People like to train their upper limb, show off their bis and tris. I wish they could really understand the consequences, because if you think of it in terms of kinetic chains and links, [they develop] this big massive link that has no relationship to the entire chain, and now it's capable of perhaps producing forces that are out of sync with the entire structure, and what are the consequences of that?

Our shape, our strengths, would have been dictated by the fact we would have had to climb a tree, or climb the face of a cliff in order to get to an apple tree, or we wanted to go down on the beach and climb over the rocks. We have to have that type of dexterity. We didn't have a fitness center with a leg-extension machine that we could go into and place weights on the weight stack and then sit into this machine, really disassociating the upper body with the lower body, and then focusing our attention and isolating the quadriceps, and then asking the quadriceps against resistance to repeatedly contract. What this is basically doing is teaching the body new neuromuscular engrams. It's teaching the musculature, this is how you contract, this is how you operate, and it's just losing the connection between the entire body – which would be full-chain kinetic exercise.

**BT:** You're painting a really remarkable picture of just how much can change as we understand continuity better, really big differences in how we would approach surgery, movement, manual therapy, and just how we would live in our bodies generally.

**JS:** I love sport and I want to play in sport. If people love the gym and want to lift incredibly heavy weights and do leg extensions, I don't mind as long as they've been informed [and] understand what the ramifications are. What I am concerned about is children, and children involved in sporting activities and in very strenuous activities. That will have long-term ramifications as they become adults. For people who think that it is a great idea to be able to raise your leg, your lower limb, in a fashion that mimics kicking an imperial guard who's on an imaginary horse in some paddy field in China, if that's what you wish to do because you're involved in the martial arts and you love that, then knock yourself out. Just bear in mind that having that type of range of motion could bring with it some issues later in your life. So we need to make sure that we're giving people the right information.

**BT:** I am so grateful for all the work that you're doing, really shining light on this new paradigm and being able to build the bridge. Thank you so much, John.

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# Musings on Tensegrity and Biotensegrity

By Michael Maskornick, Certified Advanced Rolfer™

I trained at the Rolf Institute® shortly after the publication of Ron Kirkby's (1975) article discussing the idea that tensegrity can provide a sensible explanation for how changes in the fascial web exert a broad influence throughout the structure of the human body and a justification for calling our manipulative strategies 'structural integration'. For a short time after that I became a model builder, creating a modest collection of tensegrity spheres, prisms, and towers. My interest was rekindled on reading Sjaza Gottlieb's (2015) article in this journal, "Biotensegrity: Paradigm Shift" that reviewed Graham Scarr's (2014) seminal work, *Biotensegrity: The Structural Basis of Life*. Since I already had experience working with string and dowels, I began to wonder about using curved struts instead of dowels in their construction.

## Playing with Models

Let's start with Figure 1. This is a picture of the tensegrity models that reside in my office. The two wood and thread models are thirty-year-old structures that represent my introduction to tensegrity. The arced plastic and string models are less than three months old, inspired by my reading of Scarr's book.

As I read the book and looked at the figures, I realized that looking at two-dimensional representations did not really help me understand the three-dimensional reality of these models. Having already lived with models containing linear compression components (struts), I set out to construct models using arced struts. The first thing I learned was that these curved models are much harder to make and stabilize. Maybe if I were a fly fisherman who made his own gnats and flies, I would have a workshop geared to the project, but not so. As I became more skilled, I found that making a functional tensegrity sphere required struts with an arc between  $120^\circ$  and  $1^\circ$ . Arced struts larger than  $120^\circ$  cause the struts to touch each other on minor compression, thus eliminating the model from the tensegrity definition and reducing the model to a mixed-breed tensegrity/stacked-block contraption.

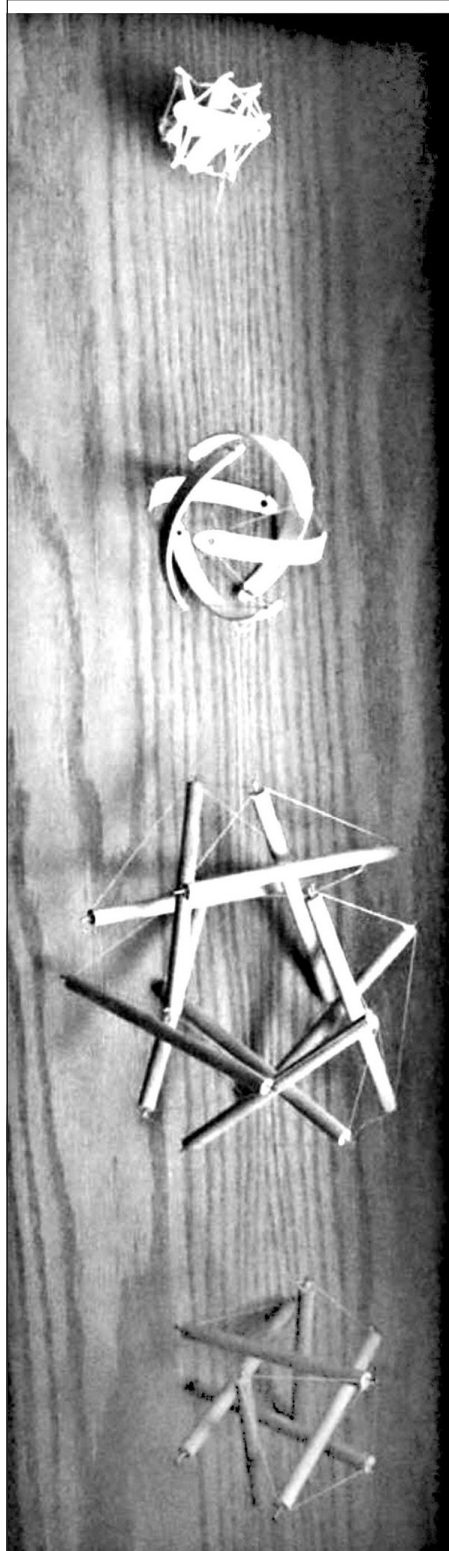


Figure 1: Tensegrity models.

The spherical model (second from the top) was made from struts with a  $120^\circ$  arc. Continuing my exploration, I found I could make an 'inverted' sphere with the convex surface facing toward the center of the sphere. Hence the top (not really spherical) model. In order for this 'inverted' model to function as a tensegrity object, the arc of the struts had to be less than  $60^\circ$  to avoid contact between the struts. In simple terms: for a normal tensegrity sphere, the compression arcs (struts) must be more than a  $120^\circ$  arc of a circle. Larger than that range the struts will contact each other, negating tensegrity. On the other end of this model, an inverted tensegrity sphere must have struts greater than  $-60^\circ$  degree arc (i.e. between  $0^\circ$  and  $-60^\circ$ ), obviously closer to a straight strut than the previous model. Within this range the models demonstrate two important characteristics of tensegrity structures: dissipation of stress throughout the integrated structure and nonlinear adaption of the overall structure to distribute those stresses. I don't have any great insights about this, but I did notice that as I was making the inverted sphere, up to a point of 75% completion the inverted sphere could revert to a normal sphere. This may imply that in physiological structures this back-and-forth play between the two forms can continue up until final closure prohibits such exchanges. Figure 2 shows the arcs that I am discussing.

My interest in creating these models was inspired by Kirkby's article using the application of tensegrity to biological structures. I quickly noticed, however, my tendency to build more complex structures, ultimately making the larger dowel/thread model in Figure 1 (ten dowels, forty strings, two reversing layers), essentially drawing my attention toward solid geometry and away from organic structures.<sup>1</sup> There is a message here. In order to create these geometrical shapes, the relationships represented in the model become more bound by the mathematics of geometry and less like the relationships in living tissue (nonlinearity). I believe that this holds true for both tensegrity and fractal math. In living matter there exists a random variability that interferes with higher levels of continuity and orderliness, making these models less applicable. So while the larger, more complex dowel-and-string models are attractive and engaging, they draw our attention away from living organic forms.

I encourage anyone reading this to try to construct these models as that is far more

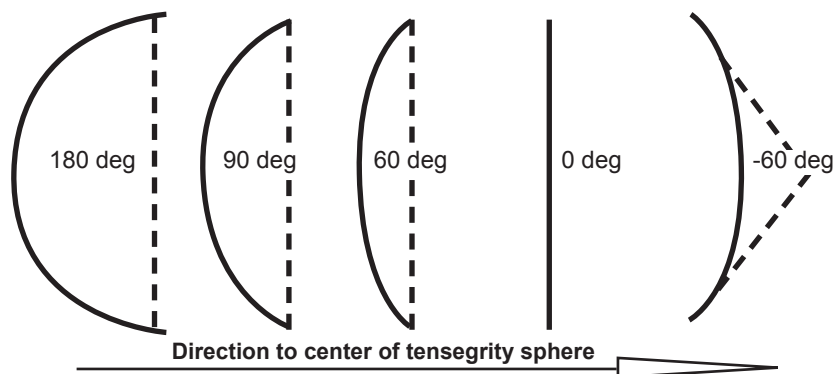


Figure 2: Different degrees of arc in a tensegrity sphere.

instructive than simply reading some text or looking at two-dimensional photos or drawings. Remember that this is basically the study of solid geometry and not physiology.

### Biology and Tensegrity

Two major characteristics of tensegrity models are how they retain shape and maintain tone under a wide range of external strains. First, if you compress a tensegrity sphere, it begins to resist compression while at the same time expanding slightly in all three dimensions without contact between adjacent struts until its limits are reached. Second, if you begin expanding the structure, it resists as a whole, reshaping also in three dimensions until its limits are reached. Both compression and expansion demonstrate how these spheres disperse strain throughout the structure without concentrating it on any single area. Third and fourth, if you twist and bend tensegrity tubes (bi-helical structures), they retain and expand their inner dimension and they resist crimping and folding (Scarr 2014, 53-54). From these four observations it is easy to draw conclusions as to the source of the durability and resilience of cells and tissues, surviving forces that might be expected to destroy them. It is important to note that the responsiveness and resilience of the whole structure is retained up to the limits but gives little information about fracture or collapse during failure.

The tensegrity model allows the macro and micro worlds to integrate. Collections of micro tensegrity units can be grouped into a hierarchical macro structure that retains the functionality of tensegrity.<sup>2</sup> This allows us to talk about integration over a hierarchical size that covers many powers of ten, and we can relate the behavior of the macro-structure (bone, fascia, muscle) to that of the micro-structure (cells, tubules, extracellular matter). That is pretty exciting.

### Working with Biotensegrity

After reading Scarr's book, I began to reconsider my way of working, taking into consideration that the macro structures of the body are built on a hierarchy of micro structural biotensegrity elements and are still governed by the mechanics of tensegrity. Just thinking this way has changed my focus and awareness regarding session design. (Remember Korzybski: "What you think governs what you see and what you ignore."<sup>3</sup>) I don't think this has been a global change in my thinking or perception, but it has influenced how I think about flexion, extension, muscular pull, tendons, aponeuroses, and how stress and strain are distributed throughout the body. It has caused me to think about the source of the fluidity and resilience that I perceive.

The likelihood that elements not directly related to the structure under strain will have a significant impact on the greater structure now requires more consideration. The three-dimensionality under my hands is now perceived as more complex. Stretching, molding, compression and expansion, as well as indirect manipulation and unwinding, require a much broader perspective taking into account the slow accommodation of membranes and fascial sheaths from distant locations. This, then, requires a new perspective on the timing between sessions.

Before moving on I want to express some of my hesitation regarding biotensegrity. In a living organism there are no straight lines, nor are there tightly wired cables. Anything that might be considered a strut is irregular in shape and slightly flexible. Instead of cables there are wide sheets of connective tissue, often with semi-rigid tissues imbedded within (more like a drum head than a cable). The whole structure is

managed by muscle tissue, ligaments, and tendons. The structures, while orderly, are often crisscrossed with fascial planes that serve to tie the whole of the volume together and act as support for the general shape. So, at best, we can use the tensegrity model as a concept, not a fact. It is important to remember that this topic is highly abstract and thus has the risk of confusing our awareness and perception of touch and take us away from the 'silent level' of awareness (again Korzybski; more below). It is also human nature to fall in love with the models and concepts that we create and to make every effort to alter our perception of reality to fit our theories. However, if we approach our physical contact with this in mind, the volume may begin to feel like a complex, integrated organism, and we can treat it accordingly without being locked into the tensegrity model. Having said all that, I have lived with these models for thirty-five years, and I still use them to explain the relationship between tensegrity and structural integration.

### Biotensegrity and the Cranium

If the cranium is considered a biotensegrity sphere (Scarr 2014, Ch. 8), it is no longer adequate or appropriate to just consider strains as localized along sutural lines and junctions (lesions). The dura must be considered a tensional element of the skull that functions to retain the form and fluidity of the whole. This is just another way of saying that the three-dimensional shape, fluidity, and resilience of the cranium is governed as a whole by the dynamic interplay of dura, tentorium, falx, bone, cerebrospinal fluid (CSF), and brain. Injuries and lesions still exist and will still be responsible for distortions and restricted movement, but this new perspective expands the scope of treatment and adjustment. The overall motion of the elements of the cranium as well as the responsiveness and fluidity of the tissues must be considered in evaluating the health of the system. Strains can reside within the borders of the bones or within the volume of the brain itself (Upledger and Vredevoogt 1983, 295). These strains can be maintained by the tension created by the complex relationships among the dura, falx, and tentorium (Upledger 1990, Ch. 2 and 3). The density of the tissues of the brain is now to be considered a functional part of the cranial vault.

Following up on my considerations at the end of the previous section, it is important



when working with the cranium to approach the process as three dimensional, not just working on the two-dimensional surface of a sphere as is the case when working with sutural lesions.

## Implications for Structural Integration

As I was writing this I remembered some of the paradoxes in the writings of Dr. Rolf that we were challenged by during our training.

### *Gravity Is the Therapist – The Skyhook*

As gravity compresses the biotensegrity tower of our spinal structure, the column first contracts but then expands in all directions, one of which creates lift. Similarly, the pull of any muscle on the spine activates a complex expansion of the whole column. I would now suggest: biology and evolution are the architects; gravity is the therapist; and we no longer require an imaginary skyhook attached to our head to keep us upright. As long as the membranes remain competent, the spine retains fluidity of movement and a wide range of responsiveness, which then feels like floating and lift.

### *Contraction of the Psoas Extends the Spine*

We were challenged to explain the statement “when the psoas contracts, the spine lengthens.” Building on the model for lift under the force of gravity, we can consider the spine a helical tube that retains its inner dimension while flexing or rotating. In order not to crimp under flexion, the spine must lift and extend. Only when the relationships among the supporting structures begin to fail do we see collapse onto the disks with subsequent pathologies.

### *Interplay Between Flexors and Extensors*

Similarly, movement of the joints is much more complex than coordination between flexion and extension (Scarr 2014, 60, 63-68). Joints may be considered to be biotensegrity spheres integrated with biotensegrity towers. Movement is the interplay among supports, tension, and action. Looking through this lens at the elbow, knee, hip, or shoulder, you can see that the movement of the joints requires much more complexity than a simple pull/release model to maintain the space and fluidity within the joint capsule. This helps explain what Rolf called ‘lift’ and we now call ‘palintonicity’ in relation to the space

between the eleventh and twelfth ribs and the pelvic ilia.

### *The Little Boy Logo*

The Little Boy Logo has always brought to mind the ordering of the body presented in Reichian therapy, where each of the tension bands might represent a transition between adjacent tensegrity spheres. Structural integration has presented these bands as horizontal planes that separate different visceral spaces. I think we can also interpret these horizontals as the space where one biotensegrity sphere relates to the adjacent one without necessarily integrating. These breaks in pattern offer the possibility of distortion and collapse without complete disruption of the biological form. It also offers reintegration by establishing congruent relationships between the adjacent segments.

### *Levels of Abstraction and the Silent Level*

The ‘silent level’ of our work represents the level of direct experience below the levels of abstraction and naming (Feitis 1979, 45-47).<sup>4</sup> This level was strongly emphasized in early trainings. It is the level that is compromised when we think we know everything there is to know about structure and living processes and we use language to define our protocol process. In other words, our language pulls us away from our direct experience. The silent level is the level associated with deep meditation and the consequent awareness that emerges.

### *“Compound Essence of Time”*

In a discussion with an osteopath about how Rolfing® SI doesn’t seem to affect everyone equally, he pointed out that Rolfing SI was missing some concept of time; i.e., how long it takes for a session to have an impact. (Feitis 1979, 48.) Thinking in terms of a tensegrity model, we can consider the widespread interactions among fascial membranes and layers and the adaptations that occur as the layers shift. It makes sense that this is a process that is dependent on the fluidity and resilience of the membranous layers.

## Conclusion

In summary, tensegrity is a theory that fits into a relational (nonlinear) model of biological structure (hence biotensegrity) that keeps us thinking about how the human structure has evolved as a response to the vertical line of gravity. The three-

dimensional aspects of the structure add enough complexity to require additional thought to the original model of a tensegrity sphere to explain our work.

*Michael Maskornick, Certified Advanced Rolfer, was introduced to Rolfing SI in 1974 by Leland Johnson and Jan Sultan. One of the first practitioners who never met Dr. Rolf, Michael trained in 1978, moved to Bellingham, Washington, set up his low-key practice, and has worked and lived in the Pacific Northwest ever since.*

## Endnotes

1. You can see here the flattening of the two-dimensional picture, minimizing the fluid dynamics and vitality of the three-dimensional sphere. It also limits your ability to see the complexity of the volume defined by the sphere.
2. The ‘Little Boy Logo’ is an example where each block is considered as a unit that then integrates onto the body as a whole, each exhibiting some level of integration.
3. Do a web search on Korzybski or general semantics for a sense of this complex theory, especially hierarchical levels of abstraction.
4. This level is associated with the first level (and subsequently the fifth level) of abstraction in Rolf’s discussion of Abeldard. Rolf’s scheme of these five levels is: 1. Sensing, 2. Classifying, 3. Relating, 4. Postulating, and 5. Unifying.

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# Manually-Evoked Tensegrity and Pandiculation, Part 1

## *Building a Style of Touch*

By Luiz Fernando Bertolucci, MD, Certified Advanced Rolfer™, Rolf Movement® Practitioner, Rolf Institute® of Structural Integration Faculty, with Angela Lobo, Certified Advanced Rolfer, Rolf Movement Practitioner, RISI Faculty

### Foreword

This article describes the development, initially serendipitous, of a style of fascial manipulation currently referred to as Tensegrity Touch. Its outset was the observation from various Rolfer colleagues who noticed “something different” in the my (Bertolucci’s) manipulation maneuvers.

### Operating from the Outside: Blunt Dissection

This all started back in the late 1980s, during my residency in physical medicine and rehabilitation. I had planned to study Rolfing® Structural Integration (SI), and by way of illustration to my mentor, I touched his forearm in a way that I described as “freeing the myofascial compartments from each other.” A wise and open-minded orthopedic surgeon, Dr. Rossi added, “You mean that applying Rolfing SI you *operate from the outside*?” I laughed as if I had heard a joke. Years later this would come back to me, as I will describe below.

I graduated as a Rolfer in 1990 and started my practice in São Paulo. Impressed with the first results of applying Rolfing SI to the same clients to whom I was used to prescribing physiotherapy, I plunged into further study – initially extracellular matrix (ECM) physiology, aiming to better understand what could be happening under a manual therapist’s hands.

### A Different Way to Touch?

Around four years later, I started hearing from Rolfer colleagues that my touch felt “somehow different.” As I heard this more and more often, I gathered a group of Rolfers and began an empirical research project to investigate whether there was indeed anything significantly different in the techniques I applied from those traditionally employed in Rolfing SI.

We initially noticed two singular features to my way of working: 1) a way of *engaging* tissue from the skin that gave

the practitioner the clear sense of internal gliding happening under his hands, and 2) a sense of the touch meeting *firmness*. These were the first of various features progressively identified as components of my style of touch.

One day during a session, I suddenly recalled Dr. Rossi’s words. Sensing internal tissue gliding, I related his words “operating from the outside” to the surgical concept of *blunt dissection*: a way to separate tissues during an operation using a blunt tool, commonly the fingers. There seemed to be a very *precise* way to steer one’s touch to the gliding surfaces (planes of cleavage) among myofascial compartments. This led to the nickname of our first workshop: Surgical Rolfing SI.

The main element in achieving this blunt-dissection effect seemed to be shearing the skin on top of underlying tissues to the end of its mobility in a particular direction. (We now call it ‘milking’ tissue from one hand to the other.) We surmise this possible biomechanical explanation: shearing tissues further loads the fascial system (beyond its basal prestressed status) to the end of its elastic phase (when the practitioner feels a sudden stop), thus reaching the viscous phase of the tissue in which plastic changes can take place. Such manual loading would tense the matrix links in the superficial fascia (SF) and be transmitted to the remaining matrix ‘net’. As such, the SF could be considered a ‘handle’ to access the fascial system. It is thus as if the practitioner is creating a knife that can reach virtually any location, and the handle of the knife is the loaded tissue in the touch interface.

An abrupt snap (possibly between myofascial compartments) is sometimes noticed during a maneuver, followed by significant clinical improvement. Might the manipulation be affecting *relative muscle position* (Maas and Sandercock 2010)? This led to another transitory naming attempt, Muscle Repositioning.

### Tensegrity Induced by Touch

So we were investigating a way of touching that gave the sensation of shearing tissue and eventually repositioning muscles *in relation* to something else, but what else? We did not know at that point. The ‘surgical’ and ‘muscle repositioning’ concepts seemed sound, but they didn’t explain the quality of *firmness* felt under the practitioner’s hands. We considered various concepts to describe this relationship. At some point, we noticed that the firmness under the hands arose when the touch related to the client’s whole-body *weight*.

Palpating a relaxed body on your table, it is difficult to sense its whole weight as the segments are free to move in relation to each other; in other words, there is slack in the system. Just as holding a piece of meat on a cutting board stabilizes it and helps with cutting, in fascial manipulation, firmness in the client’s body seem to optimize its effects.

Our finding is that combining a shearing with *pressure*, delivered in specific ways, engages the three-dimensionality of the client’s body, *linking or integrating* body segments so as to unify them in a *single unit*. Thus, the manual input evokes *tensegrity* in the system. Tensegrity evoked by touch can be seen (see Video1, listed in Video References at the end of the article) and also palpated when small sonar-like oscillations are imparted to the client’s body under the condition of fascial loading. With this shearing loading, body segments move in phase and in the same direction throughout the body. With ordinary oscillations (a slack system), the movement begins where the body first receives input and moves in waves in various directions through segments sequentially (see Figure 1).

With tensegrity evoked, the practitioner can sense the client’s whole body weight (its center of gravity) as the segmental centers of gravity are linked. This provides the sense of a firm and steady platform that gives a counter-force to the practitioner’s input, and we assume this improves the ‘blunt-dissection’ effect. *The key to evoking tensegrity is the way shearing and pressure are combined*. Shearing alone drags tissues from superficial to deeper structures and at some point moves the latter in the direction of the shearing. Pressure alone squeezes tissues and dissipates the forces randomly. When shearing is combined with pressure with appropriate timing, quantity, and

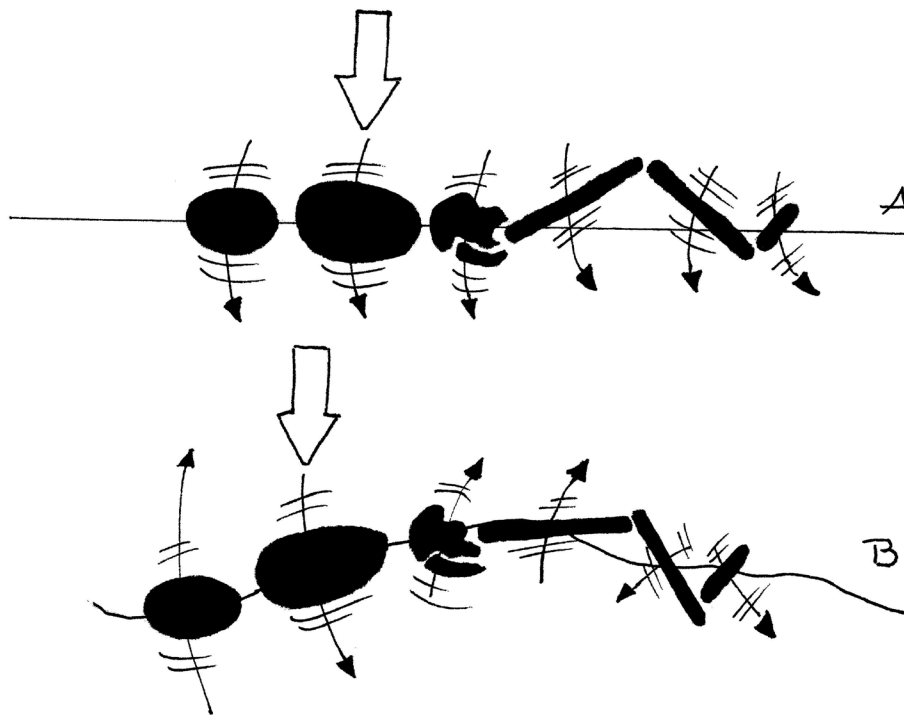


Figure 1: The effect of sonar-like oscillations under fascial loading (tensegrity) and under fascial slack. The white arrows show the vector of sonar-like oscillations manually imparted to the thorax. In (A), with previous manual loading of fascial system, the segments are integrated and move synchronously (in phase) in the same direction. In (B), without previous loading (slack system), segments are not integrated and move out of phase, in various directions. See also Video1. Illustration by Angela Lobo.

direction, it is possible to 'corner' deeper structures (especially bones) *in relation to* the previously loaded (sheared) tissue so that they are not dragged but rather stay still. There is thus a steady platform so that 1) tissues are not squeezed and 2) the force seemingly flows from the touch interface and concentrates wherever internal mobility among compartments is restricted. Adding minute torque, a third component of the touch, will 'challenge' the system and coax tissue differentiation (Figure 2). In this way, the shearing (blunt-dissection) effects *naturally occur* where they are most needed, i.e., in areas with ECM densification and/or fibrosis, even in areas distant to the region of touch (Figure 3).

It is our understanding that manually evoking tensegrity emulates the inter-compartmental movements/relationships present in the client's ordinary functioning. The firm platform created by tensegrity cause tissue restrictions to emerge in the direction of the practitioner's hands, making palpatory diagnosis easier and more reliable, as such restrictions may have a *functional* significance.

## Practitioner and Client Form a Single Tensegrity System

Further explorations showed that tensegrity in the therapist's body favour its emergence in the client, i.e., ideally, client and the

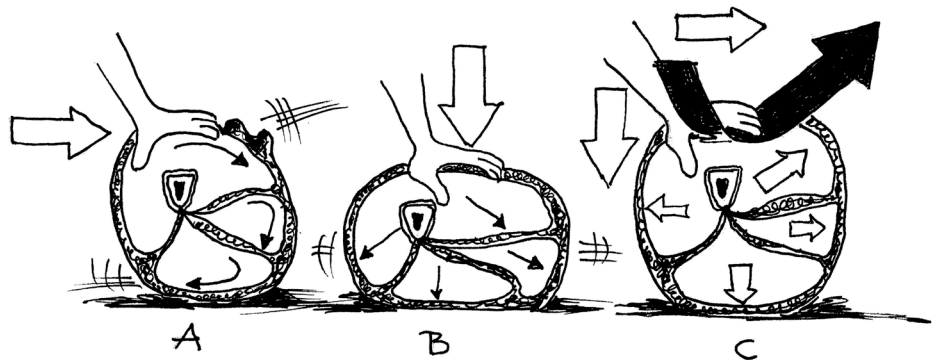


Figure 2: The combination of forces: (A) shear alone rolls compartments and drags bones along; (B) pressure alone squeezes tissues and forces are dissipated; (C) the appropriate combination of shear and pressure (white arrows) creates internal reaction forces that assemble the system and evoke a tensegrity response. Additional torque, represented by the black arrow, coaxes the differentiation of restricted tissue. Illustration by Angela Lobo.

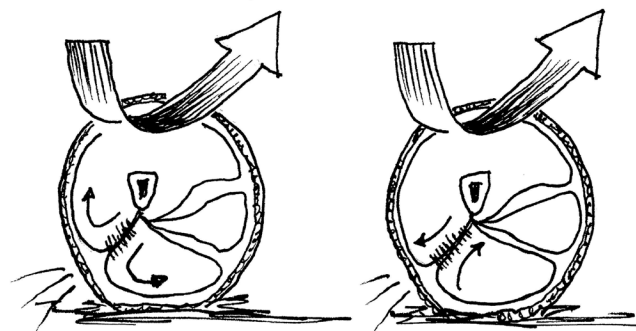


Figure 3: Two possible outcomes of differentiation between two myofascial compartments. With tensegrity, the interplay of internal forces between tension and compression elements may be such that shear vectors naturally concentrate/focus in areas of reduced mobility, which can differentiate (free) tissue restrictions even at a distance from the contact. Illustration by Angela Lobo.

therapist form one *single tensegrity system*. Under such a condition, the practitioner can relate his own center of gravity to that of the client's and, with proper positioning, rely mainly on his own *weight* to help free less mobile tissue (as opposed to the therapist adding muscle force), in a natural and effortless way (Figure 4).

Curiously, the act of evoking tensegrity, 'milking' tissue from one hand to the other and loading the client's system, seems to simultaneously load the practitioner's system, evoking tensegrity in his own body. (We also use simple *qi gong* exercises to encourage self-awareness of tensegrity in the practitioner.) Unified in a single tensegrity system, both client and practitioner often subjectively recognize an appropriateness or 'rightness' to the condition (see the section on *beneception* below). We believe forms of bodily, nonverbal *communication* may be present, which will be subject of the second part of this article in a future issue.

### Monitoring the Degree of Tensegrity

On starting a maneuver, it is common that not all the client's body segments are integrated at once. For example, the thorax and pelvis may be integrated as a unit, but without the head. So, one can talk about *degrees of tensegrity*.

We use the oscillations described above to monitor the degree of tensegrity in the client's body, observing which segments move in synchrony with the oscillations. Moreover, the small and precise oscillations allow both the practitioner and client to *feel* which segments are integrated at any given point of a maneuver. As the client can also feel the degree of tensegrity, this aspect of touch can be a resource to foster the client's embodiment and also to strengthen the client-therapist relationship. Client's and practitioner's subjective experiences have also been shown to be useful in teaching this style of manipulation (Bertolucci 2010b)

It is also our observation that the degree of tensegrity tends to *rise* during the course of a maneuver, i.e., a progressively greater number of segments move in synchrony during the oscillations. We hypothesize that manually eliciting tensegrity evokes the *spontaneous* participation of the client's system, leading to a progressively higher degree of tensegrity along a maneuver, as described below.

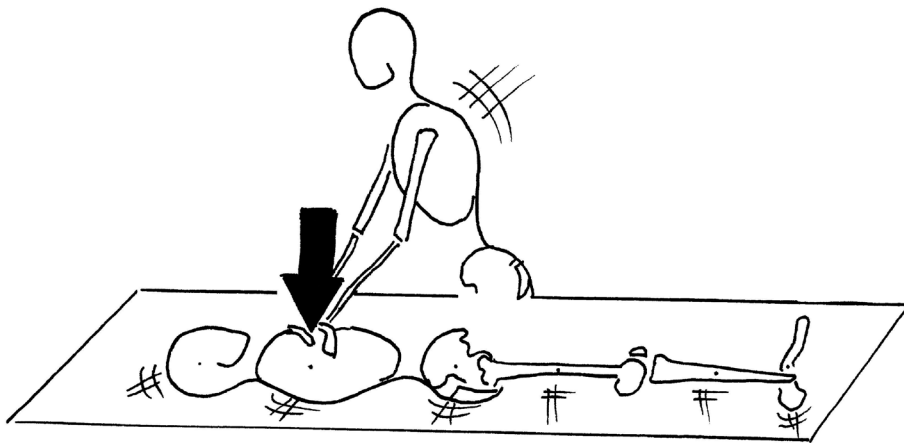


Figure 4: When practitioner and client form a single tensegrity system, any manual input will immediately transmit to the client's whole body, providing a sense of firmness and security that favours therapeutic effects. Appropriate positioning also allows the therapist to use his own weight – as opposed to muscle force – to help free tissue. Illustration by Angela Lobo.

### Spontaneous Motor Activity

At a certain point in clinical practice a curious phenomenon showed up: the practitioner sensing a *push* of the client's head against his hands when working on the occiput. This action eventually became strong enough that the muscles' action could be seen and palpated. Such observation led us to undertake EMG studies, where we detected an association between manually eliciting tensegrity and the arousal of *spontaneous motor activity* in the client's body, namely, tonic activity of the spinal erectors. Working on either the occiput (Bertolucci 2008) or the thorax (Bertolucci 2010a), we detected *tonic muscle activity* in the cervical erectors.

The spontaneous motor activity took some time to start (around two minutes), progressively rose to a peak, then suddenly fell, at which time significant tissue release could be felt under the practitioner's hands – and the client often referred to a relief or a release. To our knowledge, such a phenomenon has not been described in the literature before. Additionally, we detected *synchronous* cervical and lumbar erector activity, suggesting that the motor responses involve systemic mechanisms. We suppose that the progressive tonic activity underlies the (also progressive) degree of tensegrity observed during a maneuver, as mentioned above.

In some cases, the intensity of the motor responses became big enough to evoke *involuntary movements*, which sometimes continued even after manual contact ended

(see Video 2). Indeed, we have already observed a myriad of motor patterns, such as twitches, clonic to-and-fro movements, slow undulating movements, and isometric co-contraction in yoga-like positions, among others. Slow eyeball movements were also observed, often in conjunction with altered consciousness (see Video 3).

The question naturally arose as to which physiological mechanisms were underlying those spontaneous responses. Taken together with another clinical observation described below, they suggest the involvement of autonomous homeostatic-maintenance functions.

### Pandiculation: a Possible Link

A client complaining of neck pain had a first session. Returning for his next session, he mentioned the pain had gone. At some point he added, "I forgot to tell you that after our first session, I *slept very well* and the next morning, I *deliciously* stretched, which I have been doing every morning ever since. I then realized that at some point in my life I stopped doing the 'morning stretch', I don't know why..." [Italics are ours, explanations below.]

The association to the patterns of involuntary movements we were already witnessing was obvious: they often very much resembled (and were experienced as) the behavior of *pandiculation*, the instinctive behavior of morning stretching and yawning. Would this client be 'treating himself' through resuming his habit of pandiculation? Curiously, the word he used



in Portuguese was “*espreguiçar*” – a verb meaning ‘to take the laziness out’.

Pandiculation seems to be an appropriate model to understand the possible physiological mechanisms underlying the involuntary motor phenomena observed. Our current understanding is that there is a whole class of autoregulatory motor behaviors that work to restore and maintain the movement capabilities of animals. These could be considered akin to the *morphogenetic movements* seen in fetal development – in the sense that bodily movements are also determinants of morphology, given that they signal ECM modelling (and re-modelling) as discussed below. Pandiculation can be considered prototypical of such type of behavior. The effects would probably encompass both structural (e.g., myofascial) and neurological (e.g., tonic-postural function) effects (Bertolucci 2011).

Indeed, the phylogeny and ontogeny of pandiculation reveal its likely role in the development and maintenance of motor function. Fetal ultrasound studies on sheep (Fraser 1989a) revealed fetal pandiculation as a mechanism that influences functional determination of the moving parts of the musculoskeletal system and contributes to articular development and maintenance. Similar functions were also described in poultry, dogs, cats, and horses, among other animals (Fraser 1989a). In ostriches, a similar ‘maintenance’ pandiculation has been described (Sauer and Sauer 1967).

Pandiculation is described as a series of coordinated actions that unfold sequentially, building up soft-tissue contractile tension to a peak, at which point the joints of the limbs and trunk are maximally extended or, alternatively, the trunk is arched in flexion (Fraser 1989b). This is remarkably similar to the phenotype of the spontaneous motor activity we have been observing arising from Tensegrity Touch interventions.

## Pandiculation-Like Reflexes?

It seems reasonable to postulate that manually-induced tensegrity stimulates receptors so as to create afferents that, once processed in various levels of the central nervous system (CNS), reflexly provoke involuntary pandiculation-like responses. Which receptors could be involved? As touch is mechanical stimulus, it is likely that mechanoreceptors are stimulated, especially interstitial receptors – rich in

fascia – as well as the Ruffini corpuscles, related as they are to shearing forces (Schleip 2003); Pacinian corpuscles could also be stimulated during the oscillations. Receptors conveying *interoceptive* afferents (which monitor the physiological state of tissue, associated with maintenance of homeostasis) may also be involved. In fact, clients often experience interoceptive sensations during Tensegrity Touch maneuvers, such as dullness, burning pain, itching, changes in temperature. Such interoceptive sensations often have a hedonic value based on pleasantness or unpleasantness (Craig 2002; 2003) and may also work as a therapeutic resource in clinical practice, as mentioned below in the section on beneception.

It is also worth mentioning the possible involvement of non-neural, mechanoresponsive mechanisms such as *morphological communication*, in which morphology, physical forces, and displacements act as a non-neural channel of information (Rieffel et al, 2010), related as they are to tensegrity. This effect will be dealt with in Part 2 of this article in a future issue of this Journal.

Whatever the mechanisms involved, the involuntary tonic muscle activity of the pandiculation-like responses apparently aims – like the fascial manual input – to free structural restrictions (especially matrix densifications and fibrosis). This is what pandiculation itself seems to accomplish. This means that during a Tensegrity Touch maneuver the practitioner initially has an active role, blending manual forces so as to evoke tensegrity and, hence, the pandiculation-like reflexes. Those, in turn, progressively ‘take over’ the job of freeing such restrictions. In this sense, the practitioner works from outside in, while the client works from inside out – spontaneously – by means of the pandiculation-like reflexes. The clinical efficacy of Tensegrity Touch may be related to the summation of these effects.

## Beneception, Nociception, and Homeostasis

A homeostatic behavior is any action that brings an animal back into homeostasis when an imbalance has occurred. Interoceptive afferents inform the CNS so the required action can be planned and executed. The biological signaling in this process involves nociception and beneception (pain, pleasure, and related experiences).

For instance, when thirsty (nociception), the organism will search for water and be rewarded with pleasure (beneception) when drinking it (Esch and Stefano 2004). Similarly, it is uncomfortable to feel rigidity of movement and pleasurable when free movement is restored.

Interestingly, referred sensations triggered by Tensegrity Touch seem to convey some sort of biological meaning. We often hear from clients phrases like “I feel parts being *put in place*”; “This touch is *fixing* such and such”; “This is *the place* where the problem is . . . but *it is not over yet*; I feel some pain, but you can proceed because it is a *good pain*”; and so on. This kind of testimonial suggests that we have a system of recognizing the appropriate arrangement or relative positioning of parts/compartments within our bodies. Perhaps patterns of pandiculation arise from this interoceptive sensitivity? Indeed, interoceptive afferents have already been related to pandiculation behavior (Walusinsky 2006), as have temporary positional stress or immobility (Fraser 1989b) – that is, certain positions will create non-functional ECM links in certain areas that produce interoceptive afferents to the CNS, giving rise to the appropriate motor patterns to ‘free’ them. Maybe in Tensegrity Touch our way of evoking tensegrity somehow emulates the afferents that evoke pandiculation?

## Tensegrity in Pandiculation and Somatic Disciplines

We now recognize tensegrity in virtually all life forms from micro to macro in scale. It is a way to build light, adaptable structures – and also possibly a way to help control movement other than through neural mechanisms, as noted above. Tensegrity is present in the evolutionary behavior of pandiculation, and also in classic somatic disciplines such as yoga and martial arts – where whole body actions and inter-segmental relationships are acknowledged. Interestingly, some yoga poses are named after animal pandiculation behaviors, and martial arts movements also were often inspired by animal movements that exhibited tensegrity. Tensegrity and pandiculation are also found in more recent somatic modalities such as Eutonia, Continuum, Fascial Fitness, among others, each of which has its own way to encourage pandiculation and pandiculation-like movements.

Yawning and pandiculating in the presence of another person is considered rude in most cultures (Walusinsky et al. 2010). Do we have an embedded self-regulation resource (pandiculation) which education suppresses? If so, this may be one reason that musculoskeletal disorders are so common in our society.

## Conclusion

ECM is under constant remodeling, reflecting our motor history. In this process, mechanical stimuli are determinant: good movement patterns reflect in healthy ECM and vice versa. For instance, normally gliding tissues tend to densify and adhere when there is no movement and/or inflammation. This means that non-functional ECM molecular links are part of life, as there are periods of stillness (sleep), as well as vagaries like trauma and diseases that progressively diminish movement capabilities. Maybe pandiculation is a natural mechanism to re-regulate? Pandiculation patterns feature reaching to maximum body dimensions (Walusinsky 2006) – shapes of movement that seem to ‘refresh’ tensegrity through various body configurations. These intense stretching actions possibly free non-functional ECM bonds, restoring body architecture and at the same time stimulating tensegrity so that optimal movement patterns are perpetuated. Additionally, pandiculation resets postural muscle tonus to produce integrated movement, which in turn is a further source of good mechanical signals. In this sense, we could speculate that pandiculation is a form of neuro-myofascial hygiene that is constantly restoring tensegrity.

If this is true, might we encourage pandiculation – and hence tensegrity re-sets – to enhance general health? This would require reassessment of cultural taboos against yawning and pandiculation, as well as further investigation of therapeutic approaches that could stimulate it. Tensegrity Touch seems to be one way to stimulate tensegrity and pandiculation through fascial touch in the Rolfing SI domain.

Part 2 of this article will describe additional Tensegrity Touch features as well as discuss their mechanisms of action.

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## Video References

Video 1: <http://tinyurl.com/tensegritytouch1>

Video 2: <http://tinyurl.com/tensegritytouch2>

Video 3: <http://tinyurl.com/tensegritytouch3>

Additional videos and articles are at the blog <http://musclerepositioning.blogspot.com.br>



# From Embryo to Adulthood

## *The Human Body as a Performance of the Soul*

By Brooke Thomas, Certified Rolfer™ and Jaap van der Wal, MD, PhD

*Editor's Note: This interview was originally done for Brooke Thomas's The Liberated Body Podcast. You can listen to this interview at [www.liberatedbody.com/jaap-van-der-wal-lbp-057/](http://www.liberatedbody.com/jaap-van-der-wal-lbp-057/).*

**Brooke Thomas:** My conversation today is with an embryologist and anatomist, one of my longtime personal heroes, Jaap van der Wal. He's been a professor at various universities in the Netherlands and has also been a researcher. His work stands out, however, because he approaches these things quite differently. He describes himself as a phenomenological embryologist who is looking for the soul via the embryo. He now teaches about this all over the world through his Embryo in Motion project. Thank you so much Jaap, for talking with all of us today.

**Jaap van der Wal:** You're welcome.

**BT:** To begin, could you describe what your work is about?

**JV:** My usual opening sentence is that I'm an embryologist and an anatomist, but that I am searching for spirit in the human being. That is my mission; to help people to see and to become aware that there's something more at stake than just the matter dimension or body dimension. There's something which you could call spirit. Something in this reality which is more than just the matter dimension that we are so used to. That is my mission [I take] all over the world. I use the embryo because the embryo is the perfect domain to ask questions like, "What are we doing? What is a body? Is the body something that is producing us or is the body something we are producing? What is our body actually? Where do we come from? Is my consciousness coming from my body or is my body maybe produced or formed or shaped by me, by myself?" The relationship or the dialogue between spirit and matter, or soul and body, that's my theme and I try to help people see it in a scientific way. Not by believing in spirit and soul, but that you can scientifically, with a good scientific procedure and methodology, see such things or such qualities.

**BT:** It's so beautiful, and I think the work you're doing is so different from much of how the body is spoken about. I'm



Jaap van der Wal



Brooke Thomas

curious how you got on this path as an embryologist?

**JV:** I didn't start as an embryologist with these questions. When I was still a medical student, I came in contact with what in those days was the Institute for Anatomy and Embryology. In those days, the two disciplines were – in Holland at least – in one institute. I got a job there before actually starting as a doctor, I never practiced as a medical doctor. I became teacher, I became a researcher. I was fascinated by the body, by anatomy. Later on, also by embryology because that was in the same department.

My main work in the beginning was anatomy, specialized in locomotion – the

locomotor system or locomotor apparatus. Proprioception. In that domain of what is our perception of body, the questions started – like, "What is anatomy actually telling me about my body?" More and more I became aware of the fact that the body that I am, the body that I experience, is quite another reality than the body that I studied and learned and dissected. There apparently are two bodies in me, or two body qualities. That brought me in contact with phenomenology – the philosophy where you do not start by observing the world or becoming an onlooker and beholding your body as something like an object, but where you primarily start to experience the reality or *feel* it or take for true what your senses are telling you.

The body that you live, the body that you are, is quite another reality than the body that I had to teach students and that we met in the dissection room. There, my questions came: What actually is the body of science? Is that a reduced reality? Is that a whole reality? What is lacking in it? That brought me to embryology, with the question, Where is this body coming from and how do we live with this body when we are an embryo? What are we actually doing as an embryo? There I found, so to say, that it's not first the body that is formed, and then we start to live in it or start to be aware of it. I think that from the very beginning on, you can see that your body is a performance, that your body is a process, a lifelong performance. Literally, you are a performer, you perform your body, you shape your body. And the entity that is shaping that is me, and 'me' is not only this body, apparently also something else in that body that is the shaper, the realizer of this form the body. Like Descartes said, there are two realities, and the body is the form, the realized reality, and in me as I am living this body, there's also something else, my awareness, my consciousness, my soul, that apparently is the former, the shaper, the performer of that reality. That's a lot of words, but that's how I see it.

**BT:** I think one of the ways that we culturally reduce the body is that we decide that our brain is running the show. You say that the embryo challenges the idea that we are our brain.

**JV:** Literally, because for more than eight weeks when you are officially in the embryonic stage, you do not have a brain, at least not in the way we have now as adult beings, a brain functioning, an organ



functioning. The first weeks you do not have a brain at all. How do you exist when you're an embryo? It became more and more clear to me that the way you exist as embryo is, apparently, the same way as you exist in your body in the non-brain part, in the non-conscious part of your body. There's so much presence and awareness in your body that is not conscious, or let's say not the brain consciousness.

Actually, [I wondered] if I could find in the embryo also something like soul, awareness, consciousness – could I see it there at work? That might explain how in my body, say below the level of my neck, soul or spirit is also working and performing in the body. That's what I learned from the embryo, that your body is not producing a brain and your brain producing you. It's the reverse. You are producing – from day one, to day last, to day X – you are performing your body. It's the primary thing you do. Every morning, you wake up with a new body. It's not a machine. A machine is built up from parts. A computer is built up from bytes and chips, and it starts to function. But that's not what you do. You are constantly performing, shaping your body. You do not have a computer in your head. It's an organ that might function as a computer – which by the way is a very poor comparison, it's a very poor model – but it's not a computer, it's an organ that can function as a computer, and you have to perform that organ from day one until day last.

That's actually your primary behavior: your body is a behavior and your brain is just an organ of it that is dealing in or mostly involved in consciousness and awareness. It's not my brain that is moving my arms: I move my arm, I speak here. And for that, I need a brain, I need a guttural fold, I need a larynx, and I need arms and legs and muscles. I move, I'm not moved by one organ that is the leader of all the others, that's not what I see. I see the embryo, I see a child, I see an adult constantly performing, shaping, primarily acting his body. Actually, your body is an act, is a performance. You repeat that physiologically, psychologically, but it's not done by the brain. The brain is just one organ that is specialized in awareness or in control. Maybe it's the leader of the orchestra, but it's not the orchestra. The orchestra is your body, and that is playing the symphony.

**BT:** That's so gorgeous. I want to emphasize one thing you said because I think it gets lost for a lot of us. You said that every day

you wake up with a new body, or every moment you have a new body. I think it gets to this point you're making about your body being a performance.

**JV:** Yeah. That is the main error in modern biology. The embryo taught me again and again, we are not a spatial structure. We are a time body. Every living organism is a performance in time. You are a process, not a machine built up from particles. The anatomist is wrong. I'm also an anatomist and I had to teach it, that your body is composed from parts. No, it is not composed from parts. It's not built up from cells. The embryo shows loud and clear that you are organizing your body into parts, and it is a process in time. A lifelong process that you never stop. So you cannot say that at a given moment you are ready, or that as an embryo you are not yet a human being. All the phases of your life, from day one on, belong, are part of the whole performance in time which your body is. The embryo in you never stops, because your body remains a process – lifelong, every day, every hour. There are organs which are every minute changed in their anatomy and their form and shape. So process is the word, we are not a machine.

**BT:** It really gets to our difficulty, I think, with the present tense, understanding things unfolding in time.

**JV:** Yes. The problem is that, of course, we also are a machine, but in the sense that our anatomy, let's say our 'machinery', is formed. But it is a constant process in time: you have to shape and reshape it [all the time]. Even when computers come – and they are coming, the robots [that] will look like a human being, act like a human being, talk like a human being, even think and do things faster – the only simple thing that every human being, every little child, can do, that will never be in the capacity of that robot to do, is performing your body. Robots are spatial structures. They are machines. They are computers, and they produce action. We are primarily actions in time. Our body is our primary act, our primary behavior, our primary appearance. That can never be shared by a clever, smart, or super machine – ever. Don't consider a robot ever as a human being.

**BT:** One of the other things that we love to point to, I think, right now, are genes as what causes what happens in a body. You reject that completely. I'd love to hear more about that.

**JV:** Actually, the dogma of 'the brain as active principle' is the sister or brother of the dogma of 'the genes as active principles'. I have never in a human embryo or in any embryo seen genes being an active principle. They do not cause anything. Genes are the most inactive principles in the living organism. They only serve heredity, they only store information, that's all. They do not *cause* anything. During the development of the embryo, genes do not *cause* your properties, they do not *cause* the faults or shapes in your body. You need them, to perform that, but during your development, your genes are differentiated, your genes have these different states of activity. The thing with the gene is that it's nearly like a brain. Brain and genes have a common notion: they are almost purely form. The brain is form, a structure. The gene comes to form and structure. The most lifeless molecule that was ever produced by living beings is the DNA. The DNA is not a molecule of life, it's a molecule of heredity. It is the most structuralized molecule that has ever been produced by living organisms. It is *produced* by living organisms, like a brain is *produced* by a living organism, and not the reverse.

How come people nowadays start to think that we are robots, that we are products of our genes? That comes when you change the brain, when you change the genome, then the organism has to follow. That is why genes and brains for me are necessary but not sufficient conditions. But they are very necessary – to give your soul and body shape you need a given gene structure or brain structure. So when you change that, of course the organism starts to behave in a different way. But that does not prove that the genes or the brains *cause* your body or your consciousness, respectively.

My wife had a tumor in her brain, and her personality changed completely. It took many, many years before we discovered it. What was the first thing my colleague said? "Jaap, now you are [surely] convinced that the brain is just an organ producing your personality, your psyche, because look at your wife, if you have a damaged brain, you get a damaged personality." Yes, yes, yes, but that does not *prove* that in normal conditions, when I live my body, that my brain is producing my consciousness or my psychology. But of course if you change my brain, I have to perform my body, my consciousness, my soul, in a different way.

That is the problem with modern science. They think that the experiment proves that you are right. No. I am a scientist. I have been an associate professor in anatomy and embryology for forty years. I know what I'm saying now. I say that science is *not* like they want us to believe. They want us to believe that science is a new way to know everything, that scientists gather objective neutral facts, and that out of these objective facts, they just come to inevitable conclusions. That is false. The truth is that every scientist, including me, every scientist has in his mind, or her mind, a frame of thoughts, a hypothesis, an idea, and they are looking for the facts that are in harmony with that idea. That is what the experiment does. The experiment proves that the facts that you have manipulated are in harmony with your theory, but not the reverse. That's the problem with modern science. If you think that we are brains, you can prove it by millions of experiments. If you think that the genes are causing our properties, you can prove that by many experiments. But it's never realized in the living situation. In my primary reality, genes are not active because they are not *causing* me. Genes do not have properties. Genes cannot be illnesses. Brains cannot think. Brains cannot move. They are *necessary but not sufficient* conditions for an organism to be ill, to move, to perform.

**BT:** Going back to the embryo illustrates this. The question I'll often ask myself, just as a part of my spiritual practice, is, What is making the embryo? If we can say the embryo is making itself, what is the intelligence that allows that to happen? It's not a brain, because as you said, it doesn't start out with a brain, and it's not the genes just going along a program.

**JV:** The only answer is that apparently, in me and in every one of us, there is what Descartes called a *res cogitans*. There is something that is not just matter, it's not the material dimension you can measure. There's something else realizing itself in us. Call it your soul, call it your self, call it your mind, call it your spirit.

I'm not a dualist. Descartes was a dualist, but he did not separate the two. Descartes discriminated between, let's say, soul and body, between spirit and matter. He discriminated the two, he did not separate them. After Descartes, philosophers started to separate the two, and then they chose, as scientists, the one and neglected the other. I am a non-dualist monist. I think that body and spirit are always one. That ideal was put

forth by Rudolf Steiner of Anthroposophy, Randolph Stone from Polarity Therapy, Andrew Taylor Still from osteopathy. They all three say that spirit and matter, if they exist, they must be one – because it is a polarity, one reality is the complete inversion of the other and they cannot exist without each other. The Cartesian people always separate spirit and matter as if they are entities you can separate. You can never separate consciousness from your body. If you do that, you are unconscious. They are two realities always together. (That's why I call myself not a dualist, but a polarity thinker or a non-dualistic monist.) That maybe is the problem, that we separate the two domains, and now we gradually evolve one of the domains to be so big and so great that we think we can explain nearly everything with that and that we, so to say, do not need the other dimension as an explanation or a cause.

That is what I'm saying as a phenomenologist. I'm not interested in causes, I'm interested in questions like: What does it mean? Is there finality? Is there something going on? Is there an aim of evolution or is it just all blind causality? That is the topic I'm talking about. Causality is restricted to the body. Finality involves mind, spirit, and future. I think that modern materialism has no future. It's only the past of our genes and our brains that is ruling our society. I'm very worried about a future that will be realized by such a society that only believes in brains, genes, and bodies.

**BT:** Sometimes with clients, I try to explain that everything is connected. If your elbow is bothering you, your elbow is not in a separate room. It's actually really simple, that we're connected. I think what you're saying about consciousness and the embryo, if you're alive then you're alive in a certain way, but we don't understand what aliveness is, or that it's happening all the time.

**JV:** Another thing I learned from the embryo is that the polarity is not life versus death. We nowadays think that death – inorganic dead matter – is a primary thing, I don't think so. I think that this cosmos, this reality, is life. So life is actually something primary, and death is secondary. It might be that the polarity of spirit and matter are, so to say, two aspects of death, and that when the two aspects of death are one, you have life. Life, living is always in between. The breath of life is always in between the two dimensions of too much chaos, too much

cosmos, too much spirit, too much body, too much death of matter and death of time, space and time. Maybe life is not the opposition or polarity of death, but life is the breeze in between two polarities that might both have an aspect of one-sidedness or polarity and in their one-sidedness they are poles of death. Life is realized in the breeze in between these two polarities. Or is that too vague?

**BT:** No. I think I'd like more detail with a couple of concepts of yours, having read your article where first you talked about how you "learned from the embryo, motion is primary, form is secondary" (van der Wal, 2012). Forms come out of motion and not the reverse. Also, that the embryo is not in the past, it still exists in our human adult organism. So form coming out of motion: could you say a little bit more about that? I think that might illustrate this life/death principle some.

**JV:** Actually, motion or movement as the primary dimension is related to the other issue that I mentioned: time. That all bodies and organisms appear in time. Time and motion are related. Space, pure space, so to say, is death, as Goethe said. Motion is space in time, time in space. For me, we are therefore not only anatomy, but we are motions, processes producing forms. The important thing is that when you produce a shape, a form, that is an act. Our locomotion is not motion, our locomotion is posturing: it's a very rapid change of position, of posture of your body. It's a very fluid anatomy, but posturing. Maybe you posture not only in an anatomical way, you can do it in a psychological way [too]. Look at the structure of your mind, how you think, how you feel, your ideas, your views. It all has a kind of morphology. Everywhere, motion is the primary thing. Therefore, that is essential for living nature, that it is in motion, and that the act of motion produces facts, and facts can be space, can be body, can be thoughts, can be acts. So it's not that we first have a body and the body starts to move. No. The body is in motion from the very beginning onward, *producing* bodies, *producing* brains, *producing* genes and so on. That's what I learned from the embryo.

**BT:** When I interviewed her, Joanne Avison said that you used to always tell people "ask the embryo" when you're trying to learn something about the human body. That's been a very helpful anchor for me,

**JV:** Yeah. One of my great inspirations was Erich Blechschmidt, the German embryologist. He said, for example, don't consider soul or psyche as something that is added later to the body: you are a psychosomatic being from the very beginning. The first thing you have to do is behave in your forms, in your anatomy. He then said that the soul is pre-exercised in the body. Your body is an act, your body is behavior, and there you pre-exercise acts that you later can perform physiologically. That makes the embryo and the body so interesting. If you want to understand human behavior, let's say in a psychological way, you also have to look at [the person's] physiology, anatomy, and morphology, because there he is also exposing human behavior. The way we shape our body is a kind of free exercise of what we later on are capable of doing physiologically, psychologically. That for me was an eye opener.

Since then, I see that anatomy forms and shapes can also tell about psychology and about behavior, maybe about meaning and about what we are doing. What is expressed when I make a fist? As an anatomist and as a scientist, I'm only interested in the genes and the nerves and the muscles in the brain that causes the fist. But the most important thing in me making a fist is that I want to express something with it! I'm expressing something with this body, with this form, with this fist, and that is phenomenology. Phenomenology tries to understand the forms as expression. What is our body telling about us? It is not just that you first have a body coming out of evolution, then it started to be human. Maybe evolution is an act of trial and error, a process of trying to become a human being. Maybe evolution is our embryonic development also, but on a larger scale. Forms as behavior are telling me the meaning of these forms, telling me what we are doing, what we are, what we are going to do, and what we are meant for. Maybe that sounds too religious, but okay.

**BT:** I'm wondering if I can drop the concept of fascia in here. I saw you speak at the most recent Fascia Research Congress, and I've read your work in the compendium book on fascia that Robert Schleip [helped] put together. I know this is something you're well versed in. One of the things that I think about with fascia is that it's very faithful to your actions and your emotions. If I'm depressed, I tend to tighten up around my chest. When I sort some of those things out,

I present in the world differently, my fascia is different. How do you see fascia weaving into this conversation, no pun intended?

**JV:** When I met fascia for the first time, the first association I made was with the *meso*. Blechschmidt was the first and, as far as I know, the only embryologist who said, let us stop talking about these germ layers ectoderm, endoderm, and mesoderm. He said it is too anatomical to talk about three layers. We do not have three layers. We have two body walls, the ectodermal body wall, the endodermal body wall, and there's an in between. There is an *innerness* and the innerness is represented by the primitive fascia. The meso is therefore not a mesoderm, it is a meso quality, it is the connective tissue. That is where, so to say, the body processes start and are realized, the body processes that have to do with your *innerness*. I have two body walls to deal with the world, to act with the world, to perceive the world, and to digest the world. *In between* the two layers, there is my actual innerness.

Then I started to think, isn't that what Andrew Taylor Still is also talking about? That your fascia, your connective tissue, is much more than only your connective tissue, your skeleton, it is also your blood, and it is your locomotor system. Fascia as the organ, the world of your *innerness*, not your insides but your innerness. There where you weave, where you dwell, in between your body. Over this enormous matrix of blood and connective tissue, including sense organs and nervous tissue, you can organize your inner world, your inner metabolism, your innerness, in a morphological, physiological, psychological way. Why isn't the meso considered as the domain of soul or my innerness or my psyche? That's just a general notion that I've tried to work out during the last years.

**BT:** I feel like that illustrates to a certain degree this idea that the embryo is not past tense that it's still unfolding in our adult organism.

**JV:** It also is related to my view that it is not in the ectoderm alone, it is not in my brain, my nervous tissue alone, that I live or where I am conscious. There is also consciousness, on a lower level of consciousness, there is awareness in my heart, in my liver, and in my muscles. I worked for many years with athletes who had to perform and they said, "Jaap, you never perform with your head. You have to get rid of your head

when you do your jumps in the stadium." People always think, "I have to concentrate in order to perform." No – I have to 'de-centrate', so to say, to get rid of my head. In my innerness, that is where I know exactly how it works, what to do. And there's a lot of mind and knowledge and awareness in my body, in my muscles, in my stomach, in my liver, whatever.

Soul is not only in the brain; in your brain you get the possibility to become aware of your body, aware of your soul. I think that our brain is the organ where we can have the most distance between ourselves as participants in the body and ourselves as observers of ourselves. There's the old duality again, that is the duality of being an observer and being a participant. The participant is the body that you are, and the observer is the body that you have, and both realities are there. Scientists and neurophysiologists try to convince us that there is only one reality, the reality of the observer, and then you have to think that all your soul processes are taking place in the brain. We are processes in the body and there's another reality that we get lost from if we go on thinking we are walking brains or whatever.

**BT:** It's so interesting that we're at a time in our culture where we're always looking for the one 'important thing'.

**JV:** We are addicted to causality. Why? Because if you find a cause, of your motion for example, then you can manipulate. That is the only motive. We are addicted nowadays to genes, brains, and body because if you can find out what causes our disease or causes our behavior, then you can manipulate it. That's what we love. Of course, that is very helpful – it saved the life of my wife, so to say. I know how important that can be that you can manipulate and influence things. But it's not the only reality.

**BT:** Right. We lose something when that becomes the only thing, the only focus. You have a very potent phrase that I read, where you said, "the body does not *have* a soul, the body *is* a soul". To close, I just wanted to ask if there was any part of that you wanted to dive into a little more.

**JV:** I think that many people think that you *have* a soul. I think that is related to the fact that many people experience themselves as two entities. On the one hand there is the body and they talk about my adrenaline or my brain or my hippocampus is doing this or doing that. And on the other hand,



they have their consciousness or they have their soul. They live it as two separate domains. Are we souls? With that I mean that soul and body are not separate entities or separate domains, it is *one*. There are only two polarity dimensions, let's say dimensions of space and time for example, but it's *one*. Therefore, it is not a body producing a soul, it's a soul producing a body. It is constantly a dialogue between the dimensions. We do not *have* a body. We *are* a body. And when you are a body, you are a soul that is that body. It's playing with words but I want to express with that that we are one and not two. We are of course a duality, but we are a non-dual duality or a non-dual polarity. That is important for me, that you think in twofoldness, and not in duality as separate entities.

**BT:** Thank you so much. I honestly believe that if your work could be more digested by culture, the world would change. I'm very grateful for the work that you're doing.

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*Jaap van der Wal is a physician and scholar whose contribution to the field of embryology has included describing the bridge of science and spirituality. He is self-described as an embryologist on the search for spirit. His current focus is his work on Embryo in Motion ([www.embryo.nl](http://www.embryo.nl)).*

# Fascia Pioneer

## An Interview with Tom Findley

By Anne Hoff, Certified Advanced Rolfer™ and Thomas Findley, MD, PhD, Certified Advanced Rolfer

**Anne Hoff:** We've been wanting to interview you for the Journal for quite some time, so I'm thrilled this is taking place. Let's start with your background. You became a medical doctor in 1977, got a PhD in physical medicine and rehabilitation in 1983, did your basic training with the Guild for Structural Integration in 1991, and did your Advanced Training with the Rolf Institute® in 1998. Plus training in acupuncture and homeopathy during medical school. Was there an organic progression in all of this?

**Tom Findley:** I was exposed to Rolfing® [Structural Integration (SI)] back in college, in 1969. Sharon Wheeler was the sister of one of my college friends, Richard Wheeler – she was one of the first Rolfers. I got my ten sessions in Berkeley between college and medical school

**AH:** So even in medical school you knew about Rolfing SI. Did you think way back then that at some point you might want to do the training?

**TF:** So, in medical school I did an elective with Frank Wenger MD, the director of the department of physical medicine at the Washington Hospital Center who became my mentor, and convinced him to quit his job and become a Rolfer, and he convinced me to go into physical medicine and rehabilitation. We have always considered it a fair trade.

**AH:** Was fascia a big part of your training in physical medicine, or was it something you had to learn about on your own?

**TF:** No, so when I did my residency and got my PhD, we knew about bones and muscles and strokes, and how to rehabilitate those things. And then I got to connective tissue and – duh, we don't know anything. You know, heat a rat tail you can stretch it, that's all we knew. So there's a big gap here. So that was back in, oh, 1980, I knew there was a big gap.

**AH:** All along were you both a clinician and a researcher?

**TF:** I've been doing research since I was three years old.



Thomas Findley



Anne Hoff

**AH:** What did you research when you were three years old?

**TF:** My mother tells me I stood next to a window where the sun was coming in in the winter, and I held up a can of honey, and I stood there for forty-five minutes. Finally she said, "Tommy, what are you doing?" And I said "I doing exerment [experiment]."

**AH:** Okay, so the research bug was there young, but you also knew you wanted to do some kind of clinical practice?

**TF:** Correct. By studying to get my PhD simultaneously with my residency, I learned to go back and forth between the clinical and the research in the middle of my residency. And I just continued to do that.

**AH:** That's fairly unusual, isn't it?

**TF:** Yeah, it is. Most MD/PhDs get their PhD as part of the MD, and then they go into residency and don't do any research, and then they get out and only about 15% wind up doing research. Most MD/PhDs are just straight clinical because they never got any practice going back and forth.

**AH:** And then you've also been an educator, you were a medical school professor. So you've had these multiple streams of involvement . . . So you were exposed to Rolfing SI, and a certain number of years into your work you went off and trained – why?

**TF:** Well, I tried the training back in '86-'87 maybe – that's when I was research director of the Rolf Institute® – and I lasted about three days in the auditing. I [decided], "No way, I'm not sitting on my hands for eight weeks." So I didn't train then. But Frank Wenger had invited Ida Rolf to come work on some of his patients at Georgetown University, we also had Richard Wheeler come; they did well with Rolfing SI. It was pretty clear that Rolfing [SI] had something to play in physical medicine.

So when I was at Kessler Institute for Rehabilitation, here in New Jersey, people started listening to me when I had some pretty crazy ideas. I said, "I think this would be very useful to have here. Can we put on a training here?" I asked the Rolf Institute and they were not interested. So I asked the Guild [for Structural Integration and they were]. We found nine physical therapists (PTs) and myself, and I put down my \$5,000 check and told the hospital, "I'll pay for my own training, can you pick up the cost for the therapists?" They did, and so in 1991 the instructors flew in and we trained Thursday, Friday, Saturday, Sunday, went back to our regular jobs Monday, Tuesday, Wednesday . . . And we did that two weeks on, two weeks off.

**AH:** What was the result of the training?

**TF:** The physical therapists wound up actually doing [structural integration] at Kessler, and I went back to my full-time research job because they didn't really want me doing anything else. And so Kessler had a [structural integrator] on staff for fifteen years.

**AH:** Were they doing Ten Series, nonformulistic work? And how was that working in the health-care system, in rehabilitative medicine?

**TF:** They were doing mixtures of Ten Series, nonformulistic stuff. Actually there's some papers that came out of that, how our patients did. Our patients did quite well.

**AH:** So you've had opportunities, where you've been established and respected in the medical system, to bring in structural integration, and there's been uptake on the medical end. But it sounds like a mixture of interest, or not, on the structural integration end.

**TF:** I wouldn't call it a mixture, I'd call it not.

**AH:** So the Guild was willing to come out and train, but other than that there hasn't been interest from structural integrators to come and work in the field?

**TF:** No.

**AH:** I remember years ago when you were at the VA (Veterans' Administration) you were looking for Rolfers to come work as interns in a mentorship with spinal cord injuries. So you did not get people coming out, or not many?

**TF:** No, I didn't.

**AH:** Why do you think that is?

**TF:** I don't know. I think they're independent cusses.

**AH:** That's true of the Rolfing world. Was that disappointing to you?

**TF:** A little.

**AH:** Say more about working in a medical setting, this rehabilitative setting. What did you find when you brought structural integration into the mix of what you could already do as a medical doctor there. How did you know when to bring Rolfing SI into patient care? I think many Rolfers are overly eager to think our work can help with many things, but as a trained medical doctor you are probably more discriminating about that.

**TF:** Mostly that was in my private practice. People would come to me wanting Rolfing SI because they'd been to see a bunch of doctors. So my first question to myself was, "What did everybody else miss?," before I even decide if I'm going to work on them. And early on I had a family with a young girl with scoliosis who wanted to [get Rolfing sessions] and I said, "No, I'm not going to do it," and they insisted and went to somebody else. I said, "Okay, but let me monitor it." So we did x-rays and

all sorts of things. She came back after the Rolfing sessions and she looked better, and her scoliosis was worse. She was more balanced in her body but the curvature was worse. So we sent her to a surgeon who straightened her out.

**AH:** So the scoliosis was progressing in the way it would and the Rolfing SI was just kind of masking that on the surface.

**TF:** Correct.

**AH:** Do you think there are situations where Rolfing sessions can help with scoliosis?

**TF:** Of course.

**AH:** How would you decide when it could and when it couldn't?

**TF:** It sort of depends on how fast it's developing and how loose the tissues are. If somebody is loosey goosey in their adolescent growth spurt, it's not going to help.

**AH:** But if they are tight and bound up in ways where Rolfing sessions could help facilitate fascial lengthening in some places, it could help maybe?

**TF:** Right.

**AH:** When you worked at the VA did you find anyone interested in Rolfing SI?

**TF:** Oh yeah, we established structural integration as a skillset, and practitioners of structural integration can be credentialed and work in the VA [hospital] where I used to work. I couldn't do it all myself so I wanted to be able to bring in an assistant, but you can't work on people unless you are licensed and credentialed in the hospital. So I said, "We need to be able to credential practitioners of structural integration." I put together a packet, took it to the medical staff, and to everybody's amazement, they approved it.

**AH:** What kind of credentialing was required?

**TF:** I think that was before IASI . . . I think it just said "graduation from a school of structural integration."

**AH:** So somebody could come in with structural integration training, and without being a PT or a doctor, and work at the place you were at with the VA. Did this apply to other VA hospitals or centers?

**TF:** No, you've seen one VA, you've seen one VA.

**AH:** So everything is done at the micro level of each location.

**TF:** That's right.

**AH:** I've wondered, with so many vets coming back from these combat zones with very severe physical damage, could Rolfing SI help them.

**TF:** They even agreed to pay for Rolfing SI on the outside for veterans here, and I could not find a Rolfer who was willing to do it for what the VA would pay.

**AH:** So they weren't paying near what market was for Rolfers?

**TF:** Right, but for the experience, come on folks, these are our veterans. No one wanted to touch it.

**AH:** It seems there could be practitioners who would come in and work at a reduced rate if it were organized broadly, like the way we have children's clinics.

**TF:** The VA has every year a meeting of all their administrators. One year my hospital director was in charge of that meeting. He wanted to demonstrate different kinds of alternative medicines that are offered in the VA. So they flew in five Rolfers to work on administrators who were attending this meeting. They were booked the whole time, they delivered all these sessions. And did anybody from the Rolf community pick up on it? No.

**AH:** That's a shame.

**TF:** I agree.

**AH:** It seems like it would take the Rolf Institute or a group of structural integrators really stepping up to the plate, and somebody on the inside at the VA, to make it happen.

**TF:** That's right, and I'm no longer on the inside. I'm retired. But the rehab docs at my VA are very interested in Rolfing [SI] and they would be delighted to reorganize the program.

**AH:** Is there any way that it could be done other places too? Maybe in New York, New Jersey, there weren't enough Rolfers. It might be more viable in Denver.

**TF:** There are a lot of Rolfers in New York and New Jersey. Jason Di Filippis came out of school and came to work with me at the VA. David Wronski came forward and came to work with me at the VA, he was interested in doing the Rolfing work but I

actually got him to organize the first Fascia Research Congress.

**AH:** It seems difficult if it has to be done by each VA rather than system-wide.

**TF:** True. There's been a lot of difficulty getting acupuncturists into the VA for that reason. But once I had structural integration approved, [I said to the] people [who] had been trying to approve acupuncture for five years, "Let's just do a text search and change 'structural integration' to 'acupuncture' [in my proposal package] and resubmit it." And it flew right through the medical staff.

**AH:** If a Rolfer somewhere were interested in volunteering some time at a local VA, who would they approach?

**TF:** Probably the Chair of Physical Medicine and Rehabilitation. They would have to have a license in some state – any state, because the VA is federal. You could have a license in Colorado and practice in New Jersey.

**AH:** So you were very receptive in your role at the VA and other medical centers to alternative therapies. Is there a general receptivity or a general skepticism, or is it really a mixture depending on who the individual is?

**TF:** It depends. Overall there's quite a lot of receptivity because there's a lot of veterans who want this. There are individual physicians who are quite skeptical.

**AH:** Now there are a lot of Rolfers who don't want to touch the healthcare system with a ten-foot pole. How do you feel about that?

**TF:** [They're] cutting off their nose to spite their face.

**AH:** We Rolfers mostly love our independence, but it means there's many people who don't have access to our work or even know it exists.

**TF:** It also means you don't get any feedback on how good you are – measurement of clinical outcomes. Maybe you're good and maybe you're fooling yourselves.

**AH:** So when you were practicing both privately and in hospitals, were you doing a lot of assessments to gauge your results?

**TF:** I was bringing people into my lab at the VA to measure their balance. I was measuring nerve conduction velocity in my private practice . . .

**AH:** So with more people doing that sort of assessment we'd have a better body of evidence of what we could and couldn't do. What do you see as the pitfalls of Rolfers engaging more with the healthcare system.

**TF:** They may find out what they do is worthless. But that's true of mammary artery transplant, of lots of different procedures that eventually turn out to be no better than placebo.

**AH:** So what is your impression of the effectiveness of structural integration? Do you think it's effective?

**TF:** Highly.

**AH:** Do you think it's only effective in certain situations?

**TF:** Well, you're gonna help somebody's posture, you may not change the disease course.

**AH:** Well, Ida Rolf never said Rolfing SI was aimed at that.

**TF:** You'll find practitioners who are more into that. Trying to treat diseases with stuff.

**AH:** And certainly a lot of clients today are not coming in saying, "Align my body in gravity," they're coming in saying, "Fix my knee." Do you think there's also some risk of Rolfing SI losing its identity if we get more involved in healthcare? Ida Rolf started out teaching osteopaths and chiropractors but they wanted to borrow pieces of the work rather than do Rolfing SI.

**TF:** There's nothing wrong with borrowing pieces of the work.

**AH:** If that happened, wouldn't the work as a whole get lost?

**TF:** No. Ida Rolf borrowed a lot of pieces from osteopathic medicine. That's okay.

**AH:** I guess the question is would Rolfing become just another type of myofascial release rather than a holistic system?

**TF:** Rolfing [SI] is already a variant of myofascial release and I think it's lost the opportunity to be in the forefront.

**AH:** Do you see that changing at all with the interest coming about in fascia research, do you see the Institute trying to step into the role we might be missing?

**TF:** Well research is a highly structured speciality, if you are not trained in it you can't do it. People seem to think research is easy and it's not.



**AH:** So you came out of a lot of training to do research, and then there's Rolfer Robert Schleip who did an incredible amount of training to be able to do research. There's also people like Rolfer Karen Price who participated in a research study at Stanford, or Russell Stolzoff up in Bellingham helped a researcher with a project with soccer players. Do you think that's a way to get more research done on Rolfing SI, short of us having to go out and become researchers ourselves?

**TF:** I think that's the only way. That even if you get a PhD you still have to do collaborative research.

**AH:** Does that need more Rolfers again stepping forward and finding researchers and saying "I'd like to help," or do we wait for researchers to come to us?

**TF:** You need to find the researchers and be willing to work for research wages.

**AH:** How would you recommend finding researchers who would be interested in engaging in a study?

**TF:** Contact the key speakers from the Fascia Research Congress. Like Fred Grinnell had been seeing a Rolfer for thirty years and he never knew that Rolfing SI related to his work. He didn't put the two together. He showed the business card of his Rolfer at his talk in 2007 – how many Rolfers followed up on that? Nobody.

**AH:** We get ensconced in our offices just doing our work. It's easy to have a busy and full life doing that without considering what else we could be doing.

**TF:** Really, it's going to be the new graduates. That's true everywhere. You take the new graduates and give them a post-doctoral fellowship and work their knuckles to the bone and they come out doing things better.

**AH:** Are you still involved with the Research Committee at the Rolf Institute, or with the Ida P. Rolf Research Foundation, or are you completely retired now?

**TF:** I'm still involved with the Foundation to the extent that I can, but I'm out on disability. My efforts are limited.

**AH:** But you've been doing a whole lot these past few years, with the Fascia Research Congresses, and as one of the editors of *Fascia: The Tensional Network of the Human Body*. Is that the book that you consider "the first textbook on fascia"?

**TF:** Yeah. And I'm still actively researching how exercise affects the spread of cancer.

**AH:** I was reading a bit about that – how the tension within the fascia may have something to do with tumor metastasis. Typically Rolfers have been told to be cautious in work with cancer patients, the theory I remember when I was in school was that working fascia might facilitate the spread of cancer.

**TF:** That depends on the cancer.

**AH:** How would one know whether to work with a cancer patient or not?

**TF:** There are almost no metastases in muscle or in fascia. The chances of your fingers running across a metastasis are pretty small.

**AH:** So is the idea that if you are getting the environment softer and more organized you are supporting the body's ability to fight the cancer, or is there something more specific going on?

**TF:** More specific than that. Stiffening of fascia around the tumor is associated with worse outcome for breast cancer. Whether loosening has a healthy outcome, we don't know that.

**AH:** What about your research into exercise and cancer?

**TF:** There's a certain kind of exercise that seems to loosen tissues: you don't become muscle-bound, you become more flexible as well as stronger. It's loading the muscle when it's very short. Most exercises are done mid-range. In this alternative style you load it so that at the end of the range it has the maximum load. So instead of doing a biceps curl where at the end of the range you don't work very hard, [here you do]; at the end of the range when the muscle is the shortest the gravity is pulling the most. You do like a triceps kickback instead of an overhead press, for example. Most of the exercises in the gym are not that way, but they can all be adapted. [This was developed] in a 1948 paper by Dr. Delorme and it got forgotten. He called it Progressive Resistive Exercise. So people remembered you lift 50% of the weight ten times, then you do 75%, then you do 100%. What they missed was his earlier paper that said you do it in a way that the muscle is loaded when it's the shortest. He didn't repeat that in his subsequent papers. People have cited the papers hundreds of times but they missed the first point. I missed it too when

I studied it. I also missed the point where he said that, to his surprise, fibrotic limbs softened, skin scars softened.

**AH:** So do you have any papers on this yourself?

**TF:** That's my research. We are collecting data on young men lifting weights in two different ways and we are doing ultrasound measures of the muscle dimensions and calculating the forces and so on. That's what I'm focusing on in collecting data – how is the muscle really different when you contract in different ways? The other thing is that muscle is a filter, so that cancer cells as they travel in your blood get caught in the muscles. If you contract muscles in the right way it will pop those cells open so they don't make it out the other side of the muscle. So not only does it soften tissue, it also kills the circulating cancer cells.

**AH:** Is this how you are working out yourself these days?

**TF:** You betcha! And I have no circulating tumor cells.

**AH:** That's fantastic, Tom. Back to Rolfing SI, what else have you learned about specific ways we should use our hands that we might not be widely aware of? You wrote a paper on hyaluronic acid that seemed to suggest a particular vector of touch and also an oscillation.

**TF:** Correct. And it's not just what's under your fingers but what's next to them. When you push on the tissue you are pushing the hyaluronic acid sideways, so it's actually going to separate the layers just to the side of your fingers. So when you are gliding your fingers down, you need to think about what's at the edge of that glide.

**AH:** The lateral edge, or front and back?

**TF:** Both of them.

**AH:** What about the oscillation?

**TF:** These mechanical massagers are not a bad idea.

**AH:** Should we try oscillating our fingers as we move through the tissue as well?

**TF:** That's Stecco's technique. Antonio Stecco has his whole technique based on oscillation.

**AH:** Is that something Rolfers should be trying?

**TF:** Yeah.

**AH:** It seems like there should be a feedback loop where if you are coming up with these ideas through your research, Rolfers bring that back into what we do if it will make it more effective. Did you find ways you would adjust how you used your hands based on your research and get better outcomes, or easier outcomes?

**TF:** Yes, but not in that way. I deliberately modulate my muscles when I'm working on my clients so as to achieve modulation in their muscles. If I want a certain set of muscles in them to relax, I have to make sure those relax in me.

**AH:** Is this a mirror neuron thing?

**TF:** I don't know how it works, but it works nicely, it speeds things up, and I feel a whole lot better at the end of a session.

**AH:** I was looking at another of your papers, "Three-dimensional mathematical model for deformation of human fasciae in manual therapy." That one seems to suggest that pressure is not doing anything.

**TF:** It says pressure on the fascia lata and the soles of the foot is not mechanically moving the fascia. Around the nose, yes. Those intermediate tissues of course, yes. The really tough stuff, you've got to put all of your weight on the tip of your elbow to move them. It doesn't mean you can't move fluid down the layers, but you are not pushing hard enough to deform it directly.

**AH:** So it's an adjustment of the old idea that we are 'melting' fascia and it's more a fluid process?

**TF:** Yes, but I think you are melting some of the fascia. Some of the older Rolfers don't work on the fascia lata anymore, they say we can't move it. That's probably right.

**AH:** Based on your research and your clinical practice, what's your own best understanding at this point of how structural integration works?

**TF:** [Long silence.] Got that? Meaning, I don't have a clue.

**AH:** So are we at the same place we were forty years ago: we're doing something, we're pretty sure it's doing something, but we can't explain what we are doing? But maybe we are at least beginning to do some research that helps clarify what it's not doing and might point to something that will explain more in the future.

**TF:** Yeah, yeah.

**AH:** So what's next for you Tom? Somebody is writing a biography of you. Is this going to be a book? What's it going to cover? Research, clinical practice, Rolfing SI?

**TF:** Yes, my whole life.

**AH:** And then you are training a young physician who's going to step into your clinical shoes, and he plans to study at the Rolf Institute at some point.

**TF:** Yes, he's got good hands. I've seen him work.

**AH:** That must be very satisfying that you are not leaving the ship unmanned, so to speak. What else would you like to see as your legacy?

**TF:** Grandchildren! I put my order in but the kitchen isn't forthcoming.

**AH:** And this trip to Germany you are about to leave on? [Editor's note: in August 2016, after this interview.]

**TF:** Robert [Schleip] has his fascia research school. I'm teaching there.

**AH:** Thanks so much for your time today, Tom, and for all you have been doing over the years.

**TF:** Thank you.

*Tom Findley is Professor of Physical Medicine and Rehabilitation at Rutgers University, New Jersey Medical School. He received his MD from Georgetown University and completed his residency training in Physical Medicine and Rehabilitation at the University of Minnesota under the guidance of F.J. Kottke, a pioneer in the field. He went on to earn a PhD at Minnesota in physical medicine, and received state-of-the-art training in physical therapy, exercise physiology, psychology, and anthropology. He has extensive training in complementary medicine and until his retirement in 2016 was an active clinician (Certified Advanced Rolfer) as well as a researcher at the VA Medical Center East Orange New Jersey, which is a member of the Planetree Network of hospitals incorporating integrative medicine.*

*He is the founder of the Fascia Research Congress, and served as CEO and executive director from its inception in 2007 through 2013. As a physiatrist he treats many disorders of the musculoskeletal system. As a scientist he strives to understand their pathophysiology in order to develop focused treatments and prophylactic regimens. Fascia, part of the connective tissues that permeate the human body, may be the unifying structure and concept that is essential to elucidate the mechanisms of*

*these dysfunctions. The links between fascia and cancer were proposed more than 100 years ago by A.T. Still, the founder of osteopathic medicine. Dr. Findley is the recipient of the prestigious 2009 Northrup Award from the American Osteopathic Association for his paper "Three-Dimensional Mathematical Model for Deformation of Human Fasciae in Manual Therapy."*

*Anne Hoff now has twenty years as a Rolfing practitioner. She has a private practice in Seattle and Port Orchard, Washington. She is also a teacher of the Diamond Approach® to inner work.*

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# A Physician's Perspective

## An Interview with Wiley Patterson

**By Linda Loggins, MPH, Certified Advanced Rolfer™, Rolf Movement® Practitioner, and Wiley Patterson, MD, Certified Advanced Rolfer, Rolf Movement Practitioner**

*Introduction by Linda Loggins: Through mutual colleagues from Texas, I met Wiley Patterson in Boulder in the 1990s. Wiley and I have interacted at regional meetings, structural integration workshops, and occasional social gatherings. I consider him a friend and colleague. Wiley graduated from Universidad Autónoma de Guadalajara medical school in December 1978. He went through his initial ten-session series of Rolfing® Structural Integration (SI) in the summer of 1985, and graduated from the Rolf Institute® of Structural Integration in November 1992. Wiley did his Advanced Training in the spring of 1999, and his Rolf Movement Certification Training in Brazil in 2008. At the suggestion of Anne Hoff, Editor-in-Chief, I sought out an opportunity to talk with Wiley for this issue of Structural Integration: The Journal of the Rolf Institute®. What follows is a recent interview I did with Wiley to investigate his perspective on healthcare, and Rolfing SI, from the standpoint of a physician and a Rolfer.*

**Linda Loggins:** How important do you think it is for Rolfers to have credibility in the medical community, and what do you think is the biggest obstacle in obtaining it?

**Wiley Patterson:** I think it is minimally important for us to position ourselves relative to the medical community. I think that Rolfers are trained in a 'healing' modality and the medical community is trained in a 'treatment' modality – I think the mindset of each group is extremely different. My experience with most physicians is that they are not that interested in what we can do. It threatens their self-perceived monopoly, and most physicians don't understand healing well at all.

**LL:** You certainly can speak on behalf of physicians – that is a very interesting comment.

**WP:** In speaking with physicians over many years, most aren't interested in Rolfing [SI]. They actually quit listening very quickly. However, I've met a few who are interested, either those who have a mentality that allows for other possibilities, or those who have grown up in other countries where



Wiley Patterson



Linda Loggins

bodywork is more mainstream and don't feel threatened by it. They actually welcome it and recognize it as being valuable.

**LL:** Do you feel that it is important for Rolfers to connect with other healthcare professionals in order to gain legitimacy, or do you sense a reluctance to do so, because of a lack of knowledge of what structural integration is?

**WP:** I think Rolfers gain legitimacy because of the power of Rolfing [SI] itself. People who don't understand the work can't help to legitimize it. Those people who train to become Rolfers understand what the work can do, and that is enough. I've certainly agonized in the past over whether my work as a Rolfer would be well-received and held as legitimate by other people, but after a

while, I realized that that wasn't going to happen because Rolfing [SI] is a different paradigm. I finally got to the point where I quit trying to get other people in other practice philosophies to approve of what I was doing.

**LL:** How then do you describe yourself and what you do to prospective clients?

**WP:** Most of my new clients are well-informed about me and about Rolfing [SI] when they contact me because someone whom they trust has told them "Rolfing [SI] delivers the goods!" They have been 'pre-sold', so to speak. For those clients who aren't as knowledgeable, I explain that Rolfing [SI] improves the function and order of their physical structure. I also explain that I don't expect them to truly understand what structural integration is until they have received it in their physical bodies. I tell them the only risk to them is the time and expense of a first session, but afterwards, they will be able to determine if what they received was valuable to them. My responsibility is to deliver a successful, authentic experience to them so that they will be willing to continue exploring their potential by receiving more of the work.

I had no idea what Rolfing [SI] was until I felt it in my own body – and neither did you – but when I experienced it, the conversation broadened enormously! That's why I quit trying to convince other physicians of the validity of the work, because unless they were willing to get up on a Rolfing table, and experience it for themselves, there wasn't any valid way for me to talk about it with them.

**LL:** Because they couldn't quantify it?

**WP:** Exactly. They don't have an x-ray plate to look at, or an intellectual file to put it in, and all it does is confuse them. That's what I think is the essential problem. Rolfers have gotten better and better about describing the work as enhancing presence, organization, and awareness in an individual, because we've all experienced that for ourselves, but for others who haven't had the same experience, they don't have anything objective to which to relate. Healthcare professionals can't do it, prospective clients can't do it, and insurance companies certainly can't relate to it!

**LL:** You were already a physician when you made the decision to go through the training to become a Rolfer, weren't you?

**WP:** Yes. The first time that I heard about Rolfing [SI], it made sense to me.

**LL:** You must have already been thinking ‘outside the box’ as a physician, when you heard about structural integration, or you wouldn’t have been receptive to the idea of the work, correct?

**WP:** That’s true.

**LL:** How do you feel about the term ‘structural integration’ as opposed to ‘Rolfing’ [SI]?

**WP:** I think ‘structural integration’ is a more accurate term to describe what the work is about, but I still use the term ‘Rolfing’ [SI] a lot.

**LL:** We both know the history of Rolfing SI, in that Dr. Rolf first presented her work to the medical community, but ran into resistance. She ultimately decided to change her focus and began to present her work to those individuals who became the first Rolfers, who were outside the medical establishment at that time. If I understand you correctly, you haven’t seen much difference in the attitudes of physicians from back then until now.

**WP:** That’s exactly right. Physicians are sometimes interested to hear about the theory behind the work, to get into an intellectual discussion, but not much interested in exploring what it can do for individuals. The same is true with my efforts in presenting the work in more mainstream settings, such as to patients in my practice. If patients aren’t ready to experience the work for themselves, they don’t like it, nor do they want it. It speaks to the heart of the doctor/patient relationship. If a patient comes into my office expecting pills, and I rub their arm, they get unhappy very quickly. Some patients are inherently open to it, just because of their nature, but I believe that a large percentage of the population doesn’t want to get [Rolfing sessions]. I think it’s a decision made on an unconscious level, that they somehow sense that it isn’t right for them.

**LL:** In terms of your patients/clients, do most of the people you encounter in your practice come to you first as a physician, and then experience you as a Rolfer, or vice versa?

**WP:** That’s an excellent question, and I want to speak to it in terms of marketing strategies. People come to me expecting something in terms of a particular outcome,

and they believe that modality X will give it to them. If you deviate from their expectations, they aren’t going to want to work with you. A lot of it depends on whether they can place their trust in you to deliver what they ask for upfront.

Some of the people who come to me to “fix their shoulder” convert into Rolfing clients because I give them what they ask for, i.e., I fix their shoulder, but do it in such a way that expands their awareness of the rest of their structure. That becomes the starting point for us to begin a discussion about Rolfing [SI] and what it might be able to do for them. Conversely, I have patients who come to me for things like sore throats, who aren’t receptive to alternative therapies, and only want antibiotics. If I try to offer them something else, that is the quickest way to lose them as a patient.

I use a technique called ‘motivational interviewing’ (Miller and Rollnick 1991) when I speak to patients/clients. Sometimes I’m able to expand their line of inquiry by asking them what is it that they want, and then talk about all the things that they’ve tried in the past to achieve that outcome, whether or not their efforts were successful. I then talk about the possibilities or options available to them, and determine to which ones they are receptive. If bodywork is an option that they will consider, then we pursue it. If not, then I drop the subject.

**LL:** Change of subject – what do you think about recent efforts to limit a Rolfer’s scope of practice through legislation proposed by other healthcare professionals? You probably don’t feel threatened by alternative therapies, unlike some of your medical colleagues; do you believe this to be a real threat to others in the Rolfing community?

**WP:** Any time anyone outside the Rolfing community tries to tell Rolfers how to practice, there are going to be problems. Only Rolfers understand how to perform the work. There is always bureaucratic nonsense because people enjoy being powerful, and it needs to be addressed periodically. I like the example of what happened here in Texas, that Rolfing [SI] has been excluded from the massage laws adopted by the state of Texas. It makes it easier for us to do our work, because no one has the right to tell us what we do. Imagine if insurance companies began to tell us what to do, just like they have done with physicians – self-serving statistical analyses now dictate scope of treatment based on

reimbursement, in order to save money for the insurance companies. Rolfing [SI] is a healing art, and the imposition of legislation is counter to what’s most important, which is “What does this client need today?”

**LL:** Let me now bring up the topic of insurance companies. Most people when they graduate from Rolfing training and begin a Rolfing practice are faced with the dilemma as to whether or not they will solicit payments from insurance companies for client sessions. How do you feel about that? Speak about the advantages or disadvantages.

**WP:** The temptation is to believe that you will get your practice established more quickly by ending up with more clients. You may if you do it correctly, but you will have to work for less reimbursement per session, and you will have to allow the insurance companies to dictate the course of treatment. Most Rolfers with an established practice deal with clients on a direct-payment basis, which allows them to work in an autonomous fashion, which is the most secure kind of practice to have. No one can take it away from you. If you depend upon word-of-mouth referrals from satisfied clients, no one unhappy client can take your practice away from you. You sleep better at night! There is that initial insecurity that comes with starting out, when you wonder where clients will come from, but as your outcomes improve and you become established, you build a network that will produce referrals and help sustain the practice.

Personally, I don’t want to have anything to do with insurance companies! I would end up losing more than I could possibly gain at this stage of my Rolfing career by accepting third-party payments. Not only that, but insurance reimbursement ends up affecting the practitioner/client relationship. Time ends up being spent discussing copayments, upfront costs, etc. Clients end up focusing on the money aspect, rather than the desired outcome. From a cost-effective standpoint, the cost of extracting insurance payments can end up costing more than the reimbursement amount. My secretary can end up spending four hours of work on one one-hour claim! It can turn out to be a real nightmare.

**LL:** As a physician, you are regulated in your practice by the Texas Medical Board. Do any of the rules that they dictate affect your practice as a Rolfer?



**WP:** There are no restrictions in Texas that affect my ability to practice as a Rolfer. However, there is a Rule 200 in the Texas Medical Board Rules and Regulations that speaks to alternative medical practices. The rule states that patients have the right to seek treatment outside of established medical protocols, such as when they turn to alternative therapies after conventional medicine has not helped. Physicians are also authorized to ‘step outside’ of normal protocols when treating patients, if deemed necessary.

**LL:** What kinds of changes have you seen in medicine since you began to practice as a physician?

**WP:** When I started practicing as a physician, there were no such things as MRI machines. There weren’t as many laboratory tests to order, either, to help formulate the correct diagnosis for a patient. Physicians had to be better diagnosticians, more ‘hands-on’ in terms of using physical examination to evaluate their patients. Nowadays, although scientific understanding has gotten much more sophisticated in some areas, I see physicians much more dependent on imaging studies and test results to help determine the correct diagnosis. There is also a broader pharmacopeia to prescribe from, so that more often than not, prescriptions are used to treat patients by suppressing symptoms – which I think has become the primary goal, rather than seeking to heal them.

Medicine is much more regulated by insurance companies and by government, which I believe is a conflict of interest with a physician’s role as a healer. When insurance companies dictate the rights that patients have or don’t have, and dictate what is appropriate behavior for a physician, you are talking about bureaucratic control where physicians will obey the ‘letter of the law’, rather than the ‘spirit of the law’ on which regulations are based.

Computerization will continue to change the practice of medicine in ways inconceivable today. MRI machines, improved demographic understanding through meta-analyses, and computer generated pharmaceutical designs are current examples.

**LL:** What do you see as the future of Rolfing SI? You have obviously been thinking about investing in the future, for you have been instrumental in setting up a monthly study group in Austin, Texas for the purpose

of continuing education for structural integrators.

**WP:** I think Rolfing [SI] is a phenomenal modality. Ida Rolf was clearly a genius, and she has left a sizeable legacy to us. There are similar parallels with osteopathic manipulative work. A.T. Still was also a genius, and he left a sizeable legacy as well. Both types of work take a lot of time to master, and either one is worth a lifetime of study. Rolfing [SI] will survive as long as there are individuals who dedicate themselves to understanding its power and its scope.

The study group that I organized helps give Texas Rolfers an opportunity to dialogue about our work, while enabling us to come together and foster community, which I believe is helpful. Rolfing [SI] can be a lonely profession. Study groups can also provide continuing education in an alternative format, besides three-day workshops and formal instruction. We have had anatomy discussions over the past three years, as well as in-depth discussions on Rolfing themes and concepts. The format has allowed veteran Rolfers of forty-plus years of experience to dialogue with brand-new Rolfers just out of school. I cannot over-estimate the value of what I have personally received from the discussions. On more than one occasion, the atmosphere in the room was so profound that I could only express gratitude for what I was experiencing at that moment. I could have never gained the insights that I’ve received from the study group on my own, for the synergy of the group was responsible for it.

**LL:** Speaking of brand-new Rolfers, do you have any advice for those just out of school, or those considering a career in Rolfing SI?

**WP:** In order to master the work, I believe that you must be very intentional in how you go about doing so. I don’t think that it happens by chance. Early on in my career, I picked out people that I admired because of the results that they were able to achieve with their clients, and I sought out opportunities to listen to them and try to understand the perspective that each one of them had toward Rolfing [SI].

For those people expressing an interest in becoming a Rolfer, all I do is encourage them. Even though it’s a very unusual path to take, it leads those who follow it to self-fulfillment and awareness that most people on this planet never achieve. It’s certainly not the only way for people to

gain awareness, but it is a very formidable way to achieve it.

**LL:** Any last thoughts?

**WP:** There’s no question that Rolfing [SI] has made me a better physician. I learned from my Rolfing training how to perceive, and through the years in my practice, I’ve learned how to trust my intuition, how to objectify what is real and free myself from prejudices and preconceived biases. I am still improving in my ability to see the original deviation from health and the simplest way to help clients find their way back to their best possible current level of health.

I’ve also noticed that among my highly competent Rolfing colleagues, their level of critical thinking is equal to most highly competent physicians that I know, in assessing a problem that they encounter. The work demands it of us. I’ve learned about anatomical functioning in a way that most physicians don’t understand. I’m surprised by how many conditions can be resolved from physical manipulation. It has opened my eyes to the real causes of illness. I consider myself very fortunate to have been able to carry on the legacy of Dr. Rolf, and I will continue to disseminate the knowledge of her work to those who trust me with their health.

*Wiley Patterson graduated from medical school in 1978 and became a Rolfer in 1992. He enjoys sailing, aikido and time with family and friends.*

*Linda Loggins is a medical technologist certified by the American Society of Clinical Pathology (ASCP) and a Board Certified Structural Integrator. She graduated from the Rolf Institute in 1993, became a Certified Advanced Rolfer in 2002, and completed her Rolf Movement certification in 2006. She graduated with a master’s degree in public health in 2014. She walked the Komen Breast Cancer three-day sixty-mile walk for the third time this year. She especially enjoys being a grandmother to a wonderful two-and-a-half-year-old boy named Trevor.*

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# A Team Approach

By Jeffrey Burch, Certified Advanced Rolfer™

Over the decades, I have developed an extensive referral network. Many of my clients can benefit from other services in addition to what I can offer. Other practitioners have their areas of expertise and often recognize that at any given time, their clients may need additional services, including what I can provide.

I refer to some practitioners who also refer to me; there are others I refer to extensively who have never made a referral to me. I enjoy receiving referrals, but referring my clients to others is never dependent on reciprocity, it is all about the well-being of the client. After practicing in the same locality for decades, most of my new clients now come from referrals from former clients, with some from other health-care providers – notably a few MDs with alternative orientation. This referral network has developed organically over time. Some practitioners in the network are ones I have seen for my own health-care needs. Clients or colleagues recommended others.

Another local structural integrator (who is a good friend) took many other practitioners to lunch to educate them about his work, and to learn about their particular expertise. He found this successful in building his practice. I have not done this, but would consider doing so if I were in a position to build a new practice.

When sharing information with other practitioners, I sometimes send along notes with clients. Physicians regularly send me radiology reports, and occasionally surgical reports. Fax transmissions are useful for these exchanges, for rarely is there time for collaboration by phone. In all sharing of client information, HIPPA regulations concerning confidentiality must be strictly observed, and this largely excludes the use of email.

Client needs which necessitate a referral to another practitioner may come to light at any time: when completing an intake questionnaire, during the first session, during later sessions, at the end of a series of work, or any amount of time after our work is concluded.

In alphabetical order, here are some of the frequent referrals that I make:

**Chiropractors:** This group has reported that after their patients receive structural integration work from me, they are easier to adjust and the adjustments are more likely to hold. I find that in some situations, if a chiropractor relieves pressure on a nerve in a client of mine, it is easier for me to do my work. There is considerable diversity of practice among chiropractors. I refer to those whose work I know well, or who have stellar reputations in the community. I often refer to upper cervical specialists, and also to certain chiropractors who are well trained in more methods in addition to high-velocity low-amplitude (HVLA) thrust.

**Compounding Pharmacists:** Pain and sleep deprivation form an ugly feedback loop. Pain disturbs sleep, and disturbed sleep leads to bodily discomfort. Some clients with chronic pain have very disturbed sleep patterns. As practitioners, we want to organize their bodies so they can be more comfortable, but often an important stepping-stone toward healing is adequate nighttime pain control so they can get adequate sleep. Some compounding pharmacists are well educated about compounded topical analgesics. These are prescriptions where a mix of several non-opioid medications is put into a cream, thus able to be applied to painful areas. Significant pain reduction can be achieved with several advantages to the client. Because the medication is absorbed through the skin, the blood concentration of the drugs remains low, so there is less potential for liver, kidney, and stomach damage compared to oral administration. Also, the addictive tendency of opioid medication is avoided. While a physician's prescription is necessary for these drug preparations, the client having a discussion with a pharmacist well versed in topical analgesics is sometimes a good starting place.

**Cranial Therapists – Pediatric/Neonatal:** I am trained in three different directions of cranial manipulation, including training in pediatric and neonatal cranial manipulation. However, I get few newborns in my practice, so if I encounter a complex or difficult situation, I refer to other practitioners who work with babies on a daily basis.

**Dentists:** Many clients have dental and/or oral situations that are limiting their ability to be well organized and healthy in their bodies. I refer to several specialties including: general dentistry, TMJ specialists, obstructive sleep apnea appliance specialists, orthodontists, endodontists, and oral surgeons.

**Emergency Room or Urgent Care:** Clients have arrived at my office with a range of conditions that warrant prompt medical attention including: injuries from a bicycle crash on the way to my office, bones that have been broken for several days, acute appendicitis, dizziness and confusion that turned out to be a brain tumor(!), pleurisy, urinary tract infections, and kidney stones. When in doubt about proceeding with treatment, refer clients to an urgent care facility or their primary care physician. Err on the side of caution.

**Functional Neurologists:** These physician specialists make detailed analyses of central nervous system function and provide clients with activities and exercises to wake up and connect parts of the brain that have been functioning suboptimally. Functional neurologists have helped many clients with sensory integration challenges, balance problems, learning difficulties, and much more.

**Massage Therapists:** Clients occasionally ask me for referrals to massage therapists, and I am happy to refer them to people I know who do quality work.

**Mental Health Professionals:** Some clients tell me about, or manifest, emotional challenges, either situational or long term. Some ask me for referrals to mental health professionals. For others, I gently work the topic into the conversation, and if they are receptive I offer referrals to professionals I trust and whose skills may match the client's needs.

**Naturopaths:** Many naturopaths are skilled at diagnosing and treating pesky digestive-system problems. Other naturopaths are skilled homeopaths. Most are able to offer good nutritional counseling. Other naturopaths develop skills in a wide range of specialties. I have gotten to know the strengths of many naturopaths and refer accordingly.

**Obstetricians/Gynecologists:** Some women tell me about reproductive system symptoms that should be looked at by a doctor. Occasionally I see situations

working viscerally that lead my thinking in this direction. For example, a client came to me with a mild foot injury, which had not healed after two years. Exploring this, it was discovered that she had a very large uterine fibroid tumor lying on top of her iliac vasculature on the side of the problematic foot. If she lay supine, she promptly had more foot pain. I had her lie in that position and let the foot pain start. I then manually shifted the fibroid off the vasculature and the pain abated. She had been debating for some time whether to have a hysterectomy. After this demonstration, she made the decision to have the hysterectomy. This excision included an 800-gram fibroid. When the pressure on the vasculature to her left leg was relieved, her foot healed.

**Optometrists:** Clients sometimes arrive with very out-of-date vision prescriptions for their eyeglasses, which are causing them eye strain and often neck strain. I have particularly noticed that if the astigmatic axes have shifted in a client's eyes, he may be holding his head in a tilted position to compensate for it. Other clients need specialized eyeglasses for particular occupational situations. For example, an optometrist explained to me why most computer users should not wear progressive lenses while at the computer, but should instead have a dedicated pair of computer glasses. Progressive lenses provide a narrow band of vision useful at a computer that requires the neck to be held in significant extension. I recommend to clients that they seek additional help from vision specialists if eyestrain or headaches are a problem for them.

**Orthopedic Surgeons:** Some clients have arthritic changes in joints, which can benefit from surgical approaches. One indicator for an evaluation of this type is when our work increases range of motion, but the joint pain does not decrease or even increases. For the hip joint, the FABER test is also an indicator for an orthopedic exam.

**Physical Therapists:** I have no specific training in therapeutic exercise or stretching. Over the years, I have picked up a little of this and can offer clients some basic techniques. For any more challenging or complex situations, I refer to selected physical therapists whose work I trust.

**Podiatrists:** Podiatrists are licensed to practice medicine in the foot, ankle, and lower leg up to the knee. I refer medical problems in this part of the

body to podiatrists. I am particularly enthusiastic about the work of Portland, Oregon podiatrist Ray McClanahan, whose website is [www.nwfootankle.com](http://www.nwfootankle.com). He has a very insightful understanding of the toes and the role they play in the structure and well-being of the whole person. I highly recommend visiting his information-rich website.

**Primary Care Physicians:** Clients frequently mention health-care needs that should be addressed by a physician. This may be as simple as not having had a regular physical in several years, or can be a wide range of other health concerns. Sometimes I observe things and believe that a client would benefit from getting medical advice, for example, an asymmetrically shaped mole that appears to be increasing in size. In those situations, I strongly urge the client to seek medical attention.

**Sleep Doctors:** Sleep disorders are epidemic. It is estimated that one-third of the population meets full diagnostic criteria for some kind of sleep disorder. Beyond that third of the population, there are more people who just don't sleep well. I explore sleep issues with all clients and, when useful, I educate them about sleep hygiene. For more serious issues, I refer clients to physicians trained in sleep disorders. Among sleep disorders, sleep disordered breathing in its various forms [central apnea, obstructive apnea, and upper airway resistance syndrome (UARS)] is common in the population as a whole and quite over-represented in the client population with which I work, which is chronic-pain clients. In the general population, the incidence of obstructive sleep apnea alone is estimated at 20% of the population. With sleep apnea in its various forms, the combination of frequent partial waking and critically low oxygenation during the night is quite damaging to all tissues, and particularly to the nervous system. I specifically probe these issues with all clients, and it is a rare week during which I do not ferret out at least one case of sleep apnea. Usually the client was either not aware of it, or was discounting its importance. Proper diagnosis and treatment of these disorders by a sleep doctor improves tissue health, which allows my work to be more effective.

**Sports Medicine Physicians:** Physicians specializing in sports medicine are good at diagnosing musculoskeletal complaints, both axial and appendicular. They are often trained in prolotherapy, platelet-rich

prolotherapy (PRP), stem-cell therapy, and other cutting-edge methods. If a client's joint or spine-related problem is not resolving with my work, or if the symptoms are becoming more severe, I may refer the client to selected sports medicine doctors whom I know to be ace diagnosticians. One specific situation is where there is demonstrable ligament laxity that does not resolve by loosening related fibrosities; then I refer the client to a sports medicine doctor or other specialist to be evaluated for possible prolotherapy or PRP.

## Conclusion

Once upon a time, long, long ago, when I was young and naïve, I had an idea that I could learn everything. Since then, I have learned more about the dimensions of a human lifetime. Just to learn everything there is to know about structural integration has turned out to be more than a one-lifetime project.

I am a member of the Pain Society of Oregon and the Western Pain Society. In these richly multidisciplinary groups, we educate each other at our monthly meetings and annual conferences about both the outline and leading edge of each of our practices. Thus we can each recognize the signs of more kinds of issues and make appropriate referrals. I encourage those working in other geographic regions to find or found similar organizations.

*Jeffrey Burch was born in Eugene, Oregon in 1949, and grew up there except for part of his teens in Munich, Germany. He was educated at the University of Oregon, Portland State University, and the University of Pavia, Italy, earning bachelor's degrees in biology and psychology and a master's degree in counseling. Jeffrey received his Rolfing certification in 1977 and his advanced Rolfing certification in 1990. He trained extensively in cranial manipulation with French etiopath Alain Gehin, and in craniosacral therapy with the Upledger institute. Jeffrey trained to the instructor level in visceral manipulation under Jean-Pierre Barral and his associates. He has made substantial innovations in visceral manipulation particularly for the thorax. Jeffrey has also developed groundbreaking new joint-mobilization techniques. He first practiced in London, England, and later in Anchorage (Alaska), Seattle (Washington), and Honolulu (Hawaii) before returning to his native Oregon in 1989, where he continues to practice and to teach continuing education courses.*

# Rolfing® SI as Part of Healthcare

## *3H Rehab – A Residential Program for Rheumatic Patients*

By Bibiana Badenes, Certified Advanced Rolfer, Rolf Movement® Practitioner

### Introduction

Twenty years ago I became a Rolfer. Rolfing Structural Integration (SI) training changed my way of looking at a person, a client, a patient – seeing the whole person not just the parts, and also understanding the relationship of the parts. This also led me to a new sense of myself and has been extremely important in my life. Consequently, a transformation also happened in my work. Looking back I see clearly now that many of the things that I have accomplished would have not been possible without it.

In 1998 I was invited to run part of the physiotherapy program for a Swedish organization in Spain. The program, located in a non-hospital environment, was to provide rehabilitation for Swedish patients with rheumatic conditions. For adults, a four-week residential program, and for children, a three-week program were offered in my hometown of Benicassim, Spain, located along the Mediterranean Sea. For me it was a dream come true. We would have one group of patients for one month! I could do anything that I wanted incorporating movement and manual therapy.

One of my first tasks was to research programs done in other places. I had worked as a physiotherapist in the Centre Termalismo in Benicassim, and I checked out other cities in Spain – Tenerife and Malaga – where similar programs were being offered. In the first year we did movement exercises, such as stretching, general active movement for joints, massage, and hydrotherapy, and I did small myofascial interventions. At this point I did not use Rolfing SI per se; I was cautious as I did not wish to damage their tissues.

When I started the program, I created a conventional physiotherapy program; but through the years, I came to realize that working only with symptoms was not enough. The residential program gave us the opportunity to provide clients with more education and self-care. However, there was still something in me that was not satisfied. I was not working as in my training as a Rolfer, and it took me a few

years to discover this. I began to explore the evolution of the program with a Rolfing vision. The result became the 3H Rehab program: Hands, Head, Heart.

Rolfing education changed my understanding of how to work with individual clients. This was how I really wanted to work. Rather than focusing on the patient's symptoms, part of our goal was to engage the patient in understanding his/her physical condition and learning all that was possible about that condition. This goal became the core of my approach to organize a multidisciplinary team.

### Who We Are and What We Do

The healthcare team now consists of three to five additional physical therapists (trained in myofascial release and postural alignment, aquatic exercises, and relaxation), one massage therapist, a Pilates and tai chi instructor, a nurse, an ergonomic therapist, a physician, other support movement practitioners like 5Rhythms™, and myself.

The physician assesses the health condition of each patient at the beginning (I am with him) and end of the program. We use a pain analogic scale; joint measurements are taken; and spinal measurements are recorded for those presenting with ankylosing spondylitis. The patients complete a questionnaire regarding their pain scale, joint mobility, and morning stiffness at the start of each day and at the end of the program. This helps the doctors evaluate their progress and guides the treatments they are given.

Patients receive daily treatments at four stations including: 1) hydrotherapy; 2) movement exercises, body awareness exercises, kinesiotherapy (therapeutic active and passive movements); 3) massage and myofascial release (MFR); 4) ergotherapy (because the hands of rheumatic patients are adversely affected, this work helps to restore and improve hand function). Some treatments are provided in groups and others are given individually. The activities depend on the needs of each person; there is not a single standard program provided for all participants.

With a maximum number of thirty people in the program at one time, we divide them into groups, depending on their limitations, pain level, age, surgeries, heart problems, and other associated illnesses. We usually divide them into four groups so we can do individual and group work. The treatments are held in the morning, from 8:30 am to 2:00 pm; the afternoon consists of more education and fun activities, such as flamenco or cooking clases! (We have the privilege of living in a region of great gastronomy and cultural activities.)

### How the Program Evolved

To evolve and design the program, I asked myself many questions: How to discover, even with limitations, that health is possible? How can we teach prevention and maintenance? (I begin to understand that many of the things that we do as Rolfing practitioners could really be applied to the patient's needs.) How does one change the system while still in the system? How do we get results and be economically feasible? How could I do something that I would be satisfied with using a holistic approach? – that one put a great deal of pressure on me, and I could not change everything as it was necessary to do before-and-after assessments and evaluations.

When I studied Rolfing SI, we were told we should not work on rheumatic patients: that we should not work deeply on them. Initially I kept that in mind when they told me to run the program. I was afraid to work with them in the way I worked with my clients as a Rolfer – I probably did not know what 'deep' really meant and confused 'deep' and 'hard' as I see many MFR practitioners still do. Over the years, I have come to realize that you can go really deep without damaging tissues.

### Education and Prevention

When working with rheumatism, we went back and forth between the symptoms and working with and understanding prevention – gaining an understanding of what is the potential of each person. When patients are not in an acute phase of the illness, it is possible to work on prevention and education. This is different from a hospital program, where the work is with acute symptoms.

Through the years I have realized that although we must deal with the presenting symptoms, what is most important is to emphasize education when the person is



not in an acute crisis. Our patients improve vastly when we integrate a more mindful approach. We achieve our best results working with prevention, noting where the compensations occur and where we anticipate the next problem area. Taking care of oneself is not just taking medicine or doing exercises. Self-care with rheumatoid arthritis is about understanding yourself as a person.

I believe it is extremely important that all therapy is delivered to the individual needs of each patient. Often these patients have other health complications that need to be addressed or taken into consideration with a complementary health professional. I started to incorporate the Rolfing vision into the program since many problems I saw were related to the person's structure – the uneven distribution of stress in the body – and not only to the rheumatism itself. Thus, I adapted the Rolfing principles to work with rheumatoid arthritis clients.

The sessions use SI strategies to accomplish the goals of balance and alignment. The work is not based on a ten-session model; rather it is based on SI's unique understanding of the human body and structure. The clients receive twenty-five-minute hands-on treatment sessions, two to three times per week. For example, in manual therapy I position the tissue in a way to challenge the joint and tissue restrictions while applying gentle and firm pressure. I listen to the body and wait for the person's nervous system to respond so that motion restrictions are diffused as the client's awareness grows. I listen to the tissues, listen to the nervous system.

Understanding Rolfing principles of connective-tissue work and working the body from the sleeve to the core made us focus on the feet and hands due to their sensory potency, functional importance in daily activities, and continuity with the core of the body. This is so important for rheumatic patients. We use MFR as a complement to Rolfing SI, particularly as preparatory work: softening the tissue and creating body awareness. When possible, I work using Rolfing strategies for the patient to have a better relationship in gravity. We also use Swedish massage, lymphatic drainage, and other massage techniques. All the team of physiotherapists have been trained by me in MFR. The principles and vision of Rolfing SI complement the other therapies offered in the 3H Rehab program.

## Other Therapies Offered

Hydrotherapy and land exercises are included, starting with mobility exercises and progressing slowly into cardiovascular and resistance exercises. Integral Aquatic Therapy works with the fascial and joint restrictions of the client within the lower-gravity environment of a heated swimming pool. In this method, the client is supported by the water and held by the therapist's arms and some floats while being moved in ways that are not easily accessible on a table. This work achieves fascial release and activation of the parasympathetic nervous system. Since the patients have so many limitations, water is a key point within the program.

We also do kinesiotherapy (movement in general outside of water) and ergotherapy. Not much time is spent on bicycles or gym exercises as these are activities that can be done at home. However, a great deal of attention is paid to the hands since this affects almost everyone. We ask questions like: What are the hands? What do they mean in context? Hands are our way of expressing. Deformity in the hands affects the way one moves, and sooner or later a problem will develop in the shoulder, or a limp, or a stiff back will come from not having controlled balance. While the medical system attributes many of the symptoms of rheumatoid patients to their rheumatism, my experience and observation is that many of them relate to compensations developed over the years. Discovering those compensations helps to work with symptom prevention.

Most of the patients are emotionally or psychologically affected by their illness. With the loss of the ability to express with the hands and the capacity to move with ease, life becomes very limiting – especially since they live in a country where the winters are cold with snow and ice. Because rheumatic clients tend to have emotional up and downs, they are inclined to isolate socially as well.

Many patients receive cortisone shots and many are under heavy medication, so the tissues are very much affected. The most significant side effect of cortisone use is atrophy (thinning) of the skin, making it extremely fragile. When used over large areas, cortisone is absorbed into the body and causes bone demineralization (osteoporosis). Further, with their immune system suppressed, patients see a worsening

of skin infections (fungal, psoriasis, viral). So we have to be very careful with our touch and manipulations.

## The Art of 3H

It is an art to work with the patients – discovering what kind of touch one can apply. Movement education and body awareness are important aspects of the exercise therapy so patients can adequately adapt and maintain new movement and alignment patterns. Patients can change the way they perceive and understand their bodies through movement awareness, allowing them the potential of further progress when they go home.

Many patients have afflictions or deformities of their feet and easily lose proprioception, so work to recover the body schema is very important. We teach patients foot exercises that will lead to a greater sense of connection to the way they walk. We give them tools that they can use at home, such as tennis balls or balls of different sizes to help them regain proprioception and mobilization. Tai chi is also offered to provide structural support as well as spatial, emotional, and mental adaptability. Education also includes daily care routines for different body parts according to the patient's needs.

We want to support and educate each person to live in his or her own body. Rheumatoid patients become oriented around pain. When they are fine, they are not really enjoying their bodies. We want to give the message, "Come back to the body. Come back to your own perception. Come back and feel you are alive."

The structure of the 3H Rehab program offers rheumatoid arthritis patients time to recognize – and learn to respect – their capabilities based on their condition on any given day, neither forcing an unrealistic expectation of performance nor being hindered by physical limitations of the previous day. In my opinion, this acknowledgment and acceptance of being in the present is very important for fascial release and their well-being.

## Inspiration

How do we get the patients involved in their own process? How can they become engaged? As practitioners we know that this is an art. We know that we can start the process of changing them. We have to

be an inspiration. That became my goal: to be an inspiration.

Because rheumatoid arthritis is a chronic disease, without inspiration they will tend to not do anything, to view their time with us as a holiday with good food, good climate, and good company. But if we give them too much information, they may feel overwhelmed, that they have to change their whole life. My team must be an inspiration for our patients to get them involved with the process of recuperation. We co-create a team, patients and therapists. I tell the patients that we are not working on them, I do not work on them or do only a physical intervention, it has to be a collaboration. This is sometimes difficult because many of them are not ready for that. So this is something we have to encourage as a team. It's very important that the whole team understands this concept.

All the treatment programs I have seen in hospitals or in centers look the same: exercise, pools, and massages. Yet there is a key ingredient for success: awareness. It has been so important that we as practitioners understand what awareness means. We want the patients to live in their bodies. This is something that is missing many times in rheumatism treatment.

The question to our patients is, "Aside from the fact that you are an 'ill' person, can you be healthier while being ill?" When a person is ill and in an atmosphere of illness, he becomes more ill. So working in a non-hospital environment is also a key point, in my opinion, to bring out the best in the patients. Our location helps. The clients stay in hotels with the sea and mountains surrounding them. Then in this environment we work to nurture awareness. We want to give the rheumatic patient the possibility to choose what kind of movement they need, what kind of manual therapy they need, and what kind of enjoyment they want. They can only get this understanding through awareness.

## Special Work with Children

Once a year, we have a group of children. Working with them is a very different experience because we are working with the children and their parents. We do the same four stations, and we bring the parents to each of the stations. We need the parents to understand why we emphasize a particular treatment/exercise so they help or encourage their child to do it. Parents have to learn about the disease, about

nutrition and rest; they need to recognize when a joint is inflamed, and massage the child daily and do mobilization exercises. How they work with their child and teach their child daily to care for him/herself will improve the child's future. If they simply drop off their child every day for a physiotherapy treatment, there is no follow-through care and it becomes expensive and not as effective. When we involve and work with parents, we really see progress in their children.

## Summary

Many of the characteristic symptoms of rheumatoid patients are very difficult to treat. Because it is a chronic systemic disease, it is not something you have but then it goes away. It is always there. Yet working with symptoms is not enough. What I have learned through these eighteen years is that I am really interested in the whole person. By creating a better order through our work, our clients have a different awareness of their bodies and thus functional movement and daily movement options can improve. It really makes a difference.

Through my experience, I have learned that the principles of SI can be developed, modified, and continually evolved for different structural dysfunctions including rheumatic disorders. SI can be used effectively within a team of other health professionals to provide life-giving opportunities for patients of different ages with rheumatism. SI is a powerful method to implement in more holistic programs, and a structural integrator is well-prepared to coordinate such programs: he has the ability not only to see, work holistically, and create better structure and a more functional body; he also has an orientation of engaging and educating patients in self-care, which can help patients prevent future problems so they can enjoy a higher quality of life.

While my particular program is with rheumatic patients, I believe this kind of understanding can be applied to any program for well-being: for back-pain disorders, personal growth, and preventative programs for children at school. As practitioners, we have the goal of discovering the potential in our clients and patients, finding a way to create vitality, equilibrium, and well-being. I have no doubt that prevention is the best medicine if we carry it out in a way that we enjoy.

Our thoughts, our emotions, our postures, and our movements are the history of our lives, and they take a toll over the years. The model of 3H Rehab is not just a holiday program: it is the beginning of a new outlook towards health, well-being, and mindfulness.

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*At the leading edge of body-mind treatments and education in southern Europe, Bibiana is co-creator of the innovative Terapia Integral Acuatic as well as Myofascial Release Trainings, and teaches both internationally. For more than a decade she has collaborated with Spanish and Swedish businesses to offer a range of powerful rehabilitative seminars in the area of stress management, burnout, and personal empowerment. A pioneer in building bridges of contact among distinct therapeutic disciplines, she created the Bodywisdom Spain conference to promote inter-disciplinary dialogue through health that is accessible to everyone.*

# Putting the ‘Health’ Back into Healthcare

By Linda Loggins, MPH, Certified Advanced Rolfer™, Rolf Movement® Practitioner

*So many therapists are striking at the pattern of disease, instead of supporting the pattern of health. One of the things that you as Rolfers must always emphasize is that you are not practitioners curing disease; you are practitioners invoking health. Invocation is possible by an understanding of what the pattern is, the structural pattern of health. As you bring a man's structure to conform to that pattern of health, you achieve health. You invoke health.*

Dr. Ida P. Rolf

*Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity.*

Constitution of the  
World Health Organization  
(WHO)

*Health care – a set of actions by a person or persons to maintain or improve the health of a patient/customer.*

*Healthcare – a system, industry, or field that facilitates the logistics and delivery of health care for patients/consumers.*

Deane Waldman, M.D., M.B.A.

Years ago, when I first began my career as a healthcare professional, I was working as a medical technologist at a small hospital in the Dallas-Fort Worth area. I was responsible for performing laboratory testing as well as collecting blood specimens from patients by phlebotomy. I had the naïve belief that all people who worked in healthcare were doing so because they wanted to help people regain their health. Needless to say, I think it took about six months for my ‘eyes to be opened’, and I realized the fallacy of my belief.

One encounter with a patient has stood out among my memories from that job, and I

believe it illustrates what is lacking in much of what passes for healthcare in this country. One day, around 4:00 pm, I was sent to obtain a blood specimen on a middle-aged female patient. The test to be performed was a two-hour postprandial glucose level to check if the patient's blood sugar had ‘spiked’ after eating lunch (this test is a good way to gauge if a diabetic's insulin or oral medication is controlling the glucose level in the blood over time, by preventing marked fluctuations after eating). Much to my surprise, when I walked into the patient's room, she was sitting up in bed, eating a candy bar! I thought to myself, “Well, so much for the test results! This won't be able to measure anything that her doctor wants to know.”

I introduced myself and explained the purpose of my visit. She made a totally unsolicited comment that she was in the hospital because her blood sugar was “messed up” again. She just wanted her doctor to fix whatever was wrong so that she could keep eating her candy! At that point, I couldn't decide whether I was more frustrated with this patient, because she seemed to have no clue as to the long-term consequences of uncontrolled diabetes, or her doctor, who was obviously enabling the patient to continue behaviors that were injurious to her health. I remember thinking afterwards that there must be a better way. From that day on I began to ‘look outside the box’ that is traditional medicine, and search for alternatives that might be better able to support people in staying healthy, rather than simply treating disease. Eventually, I found out about Rolfing® Structural Integration.

Everyday, we speak to our clients about the benefits of Rolfing SI and how it has changed not just our physical bodies, but also how we view ourselves and the world around us. Each of us has stories about people being transformed by structural integration, and we are grateful at being able to continue the legacy of Dr. Rolf into the future. As we continue to contribute toward establishing integration and wholeness in the lives of our clients, we should also consider the

possibility of doing the same in our chosen field of endeavor, the realm of healthcare.

## Integrative Medicine – More Than the Sum of Its Parts

The term *integrative medicine* is often used to refer to “blending the best of conventional (allopathic) and complementary and alternative medicine (CAM)” (Bell et al. 2002). Combining the two systems seems like a good idea, one that seems to promise an improved package of medical care for the consumer (Bell et al. 2002). The challenges to achieving this are a number of complex practical and conceptual issues within the field of medicine. Bell et al. (2002) suggest that by adopting a worldview from complex systems theory, in which the whole equals more than the sum of its parts, a new perspective for medicine and healthcare research emerges. Does this concept sound familiar, Rolfers?

Within the field of mainstream medicine, if you were to present this idea to most practitioners, the assumption implicit in ‘merging’ mainstream and CAM approaches is that the politically dominant ‘larger unit’ (conventional medicine in the Western world) carries the values, culture, and conceptual framework into which it expects the ‘smaller unit’ (i.e., CAM) to assimilate (Bell et al. 2002). It assumes that “each CAM intervention, once tested and proven effective, can be incorporated into conventional care as now practiced” (Bell et al. 2002).

Unfortunately, much of the conventional practice of physicians, especially for the treatment of patients with chronic diseases, focuses on a specific disease process, rather than on healing the individual person (Bell et al. 2002). Dissatisfaction with how physicians provide conventional care and rely on pharmaceutical medicine continues to grow among consumers and physicians alike (Bell et al. 2002). Integrative medicine emphasizes the goals of wellness and healing of the whole person, with the patient and the integrative practitioner as partners in developing and implementing a comprehensive treatment plan. Healing is believed to originate within the patient rather than from the physician (Bell et al. 2002). The philosophy of integrative medicine is compatible with the WHO definition of health that equates health with well-being (Bell et al. 2002). Again, I ask, does this sound familiar?



The problems that the systems of CAM that emphasize healing the person as a whole (e.g., traditional Chinese medicine, Ayurvedic medicine, and classic homeopathy) encounter with Western science are that 1) no commonly used, scientific methods are easily applied to them for study; 2) there are no obvious ways to incorporate them into conventional practice; and 3) there is no Western conceptual framework into which they fit (Bell et al. 2002). Because of this, clinicians and researchers often break off parts of these CAM systems from their original context and fit these smaller pieces into the dominant model of conventional care and medical research (Bell et al. 2002). As an example, acupuncture has been studied for its efficacy with various Western disorders, but traditionally, Chinese medicine uses a program of diet, botanicals, acupuncture, *qi gong*, acupressure and environmental interventions to address systemic disturbance patterns in a given patient. In acupuncture-only research, the effect sizes are often modest, and it is reasonable to hypothesize that the effect sizes of the full treatment program would be more clinically significant if studied as used in practice (Bell et al. 2002).

Western thought has a predisposition toward pragmatism. Conventional medicine supports the belief that only outcome results that are persuasive enough will constitute acceptable evidence and will only support one health policy over another when justified by those results. Worldviews and the values placed on different health outcomes are closely related. The values that underlie medical care shape the scientific questions that researchers ask, the health outcomes they measure, and their interpretation of the results.

In contrast to conventional medicine, many different systems of CAM share the belief that a given disease may manifest at the spiritual level as well as on the physical plane. Integrative medicine proposes that the origins of disease are multifactorial more than hierarchical, and include genetic, physical, emotional, psychological, and spiritual issues (Bell et al. 2002). An integrative medicine approach seeks to discern multiple perceived origins of a disease process and addresses them all. Integrative medicine assumes that the individual has the potential for healing at the spiritual level, even when physical healing does not take place.

Conventional medicine, on the other hand, has confined itself largely to the belief that the physical manifestations are the disease and the primary domain for medical intervention. Differences between the views of conventional medicine, various CAM systems, and integrative medicine on the nature of disease can lead to divergent treatment plans and even to different goals for healing.

## Identifying and Weighing Health Outcomes

There is limited data to support the healing-oriented integrative medical approach as having an advantage over other medical worldviews. The classic view of the quality of healthcare can generally be divided into three components: 1) structure (providers' competency, equipment, etc.); 2) process (what was done? how well?); and 3) outcome (the results of the intervention).

### Structure

Clinical research generally sets randomized controlled trials as the gold standard. It is possible to establish strong causality through enhancing internal validity, but it does not allow for generalizability, which is especially challenging with CAM and integrative medicine research where practices are so diverse and practitioner competency is far from being well defined.

### Process

Problems arise from two sources of potential biases and limitations: 1) who would do the final evaluation? – complementary and alternative medicine practitioners who are not stakeholders but who are well skilled in the scientific method are hard to find; and 2) the criteria and measures used (i.e., allopathic or alternative). These two practical problems of integrative research are especially challenging partially because conventional and CAM providers often speak 'different languages' and value different outcomes.

### Outcome

Should the primary goal of a physician be solely to eliminate disease, or should it also be to optimize well-being? According to Arnold S. Relman, M.D., "Medicine cannot be expected to make unhappy people happy, or frightened people calm" (Relman and Weil 1999). Is it a proper role for a physician to assist a patient toward growing in inner peace and spiritual well-being, in addition to subduing the disease

process in the body? What outcomes matter to the individual patient, and what differential weight do other stakeholders such as physicians, third-party payers, or hospital administrators place on the outcomes that the patient desires? Who chooses the outcome goals in the end, and how do researchers measure success? Implicit in the worldview of integrative medicine, consistent with the patient-centered approach to healthcare, is the belief that the patient is the most important stakeholder and that the rest of the system must give higher priority to the patient's needs and values than it does now within conventional care (Bell et al. 2002).

## Conclusions and Implications

Integrative medicine is a system of care that considers health (or disease) as an emergent property of the person in an environmental context, conceptualized as an intact, indivisible dynamic system. Integrative medicine is a complex dynamic, higher-order system of systems, conventional and CAM (Bell et al. 2002).

In the twenty-five years since Engel published his seminal article on the biopsychosocial model for medicine, a few theoreticians have tried to point out the relevance of dynamic systems theory, chaos theory, and complexity theory for conventional medicine, psychology, and CAM. However, medicine as a field has not yet incorporated these ideas on a wide scale. It is the challenge of health outcomes research to prove or disprove the relevance of this integrative, systemic worldview to the field of medicine and to test the feasibility of its emergence as a practical and desirable way to provide clinical care (Bell et al. 2002).

### Where Do We Go from Here?

Rolfers pride themselves on constantly challenging the norm, whether in society or within themselves. We must act as responsible members of a healing profession to adapt to societal trends and take up the role of being prime movers, rather than reactionaries to changes in healthcare. To do so will require moving out of our individual 'comfort zones' and being willing to assimilate into more conventional realms so as to increase our input, and thereby facilitate change in a more integrative process-driven way. Dr. Rolf challenged the established norms of her time, and we can do no less than to

tackle established resistance and assist the apparent transformative process currently going on in medicine.

We can give money to fund the efforts of the Rolf Institute® Research Committee and stay informed. We can reach out to other healthcare practitioners in our communities, whether by beginning to dialogue as colleagues, by making referrals, or engaging in a more formal way by seeking to combine our practices with healthcare facilities. Each one of us has particular gifts that will help increase awareness within the communities in which we live. I am currently involved with the Blue Zones Project®, which is helping transform communities across the US into areas where the healthy choice is the easy choice, and people live longer with a higher quality of life.<sup>1</sup>

Healthcare has changed dramatically since I first began my professional career (Affordable Care Act, anyone?), and I am excited to see what the next ten years will bring. I believe in what Rolfing SI can bring into the lives of individuals, and I plan on devoting any future efforts toward impacting the population of my community as well. Dr. Rolf once said that presenting the concept of Rolfing SI required “compound essence of time . . . to really understand a Rolfer’s function in the community, you need to understand people’s difficulties and why they are resisting the ideas of Rolfing [SI]” (Feitis 1978). I truly believe the time has come for us to seize the opportunity and act, as the resistance against integrative medicine is shifting in a favorable way.

*Linda Loggins is a medical technologist certified by the American Society of Clinical Pathology (ASCP) and a Board Certified Structural Integrator. She graduated from the Rolf Institute in 1993, became a Certified Advanced Rolfer in 2002, and completed her Rolf Movement certification in 2006. She graduated with a master’s degree in public health in 2014. She walked the Komen Breast Cancer three-day sixty-mile walk for the third time this year. She especially enjoys being a grandmother to a wonderful two-and-a-half-year-old boy named Trevor.*

## Endnote

1. Research gathered by Dan Buettner for *National Geographic* identified longevity hotspots around the world (Blue Zones) where people lived longer with an excellent quality of life. Nine principles or practices, the Power 9, were common to some or all of the communities. Healthways, Inc. is a company that adopts towns or cities as Blue Zones Projects in order to facilitate the communities adopting healthier lifestyles by transforming the environment in which people live.

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## In Memoriam

*Structural Integration: The Journal of the Rolf Institute®* notes the passing of the following member of our community:

**Evelyn Lehner, Certified Rolfer™**

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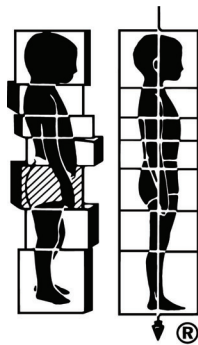
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