Rolfing® Structural Integration

Information for clinical healthcare practitioners

Written and Compiled by

The Rolf Institute Research Committee

Contributing authors: Dr. Tom Findley, M.D. Ph.D, Advanced Rolfer and Jason DeFilippis, Rolfer. Much of the description of Rolfing® Structural Integration found in this pamphlet is adapted and excerpted from Liz Gaggini’s book The Biomechanics of Alignment. Ms.Gaggini can be found at www.connectivetissue.com or at the Rolf Institute’s website www.rolf.org. A small part of the description of Rolfing® Structural Integration is excerpted from the writings of Jeffery Maitland, Ph.D. www.jeffreymaitland.com.

October 12, 2005
Rolfing® Structural Integration Guide

Table of Contents

1. Executive Summary

*Overview of Rolfing Structural Integration and its effectiveness in helping to treat medical illness.

2. Key Topics

*What are the special qualities of Fascia in relation to Rolfing® Structural Integration.
* What is Rolfing® Structural Integration in relation to Alignment (balance).
* Broader implications of the work.

3. Some Publications on Rolfing® Structural Integration and Fascia

Random Controlled Trials

Other Clinical Studies

Molecular Mechanisms
Schleip R, Klingler W, Naylor IL, et al. Passive Muscle Stiffness may be influenced by active contractility of intramuscular connective tissue. Submitted to Medical Hypotheses
I. Executive Summary

This document is for the purpose of familiarizing clinical healthcare practitioners with Rolfing® Structural Integration. Rolfing® Structural Integration is named after Dr. Ida P. Rolf. After receiving her PhD in biochemistry from Columbia University in the 1920s, she began devoting her energy to creating a holistic system of soft tissue manipulation and movement education that organized the whole body in gravity. She eventually named this system Structural Integration and discovered that she could achieve remarkable changes in posture and structure by manipulating the body's myofascial system.

Our bodies must deal with gravity like other material structures. When we are out of alignment, gravity drags us down, just as it drags down a building that has lost its architectural integrity. Whether from poor posture, injury, illness or emotional distress, a misaligned body is at war with gravity. We experience this war as pain, stress, and depleted energy. When the body loses its architectural integrity, fascia shortens and thickens in characteristic patterns of strain and tightness in order to shore us up against gravity's ever present influence. A primary principle of Rolfing® Structural Integration is that structure = function. This work helps create relationships in a client’s body that foster a better interaction with gravity and with his environment in general. In this way, improved relationships between bodily structures lead to improved structure in general and thus, higher biological, physiological and emotional functioning.

“Some individuals may perceive their losing fight with gravity as a sharp pain in their back, others as the unflattering contour of their body, others as a constant fatigue; yet others as an unrelentingly threatening environment. Those over 40 may call it old age. And yet all these signals may be pointing to a single problem, so prominent in their own structure, as well as others, that it has been ignored: they are off balance. They are all at war with gravity.” Ida P Rolf Ph.D.

Research has demonstrated that Rolfing® Structural Integration creates a more efficient use of the muscles, allows the body to conserve energy, and creates more economical and refined patterns of movement. It is also well documented that Rolfing significantly reduces chronic stress, anxiety, and improves autonomic function. This paper includes these studies among others which show the effectiveness of this original form of wholistic manual therapy.

II. Key Topics

**Fascia the Organ of Structure:**

“The fascia is the 'context' for the content i.e. the muscles, bones and organs. It is the universal environment for life. It enwraps each cell, group of cells, tissue, and organ and then finally wraps the entire body in a 'superficial fascia'. We can trace the relationships of the collagen and other fibers of the fascial matrix all the way down to the intracellular matrix.

The connective tissue matrix composes all the structural elements of the human body. This is the tissue that produces shape, form, stability and support. Skin, bone, ligaments, tendons, blood and cell walls are all forms of connective tissue. The matrix as a whole creates the structural capacity and
tensional balance that allows the body to distribute load throughout the structure in a dynamic (constantly adapting) way. The connective tissue matrix thickens, thin, bunches, disperses, twists and turns in order to compensate for injuries and misuse. These dynamics are most obvious in fascia. There are a few reasons that the adaptations and compensations described above are not altogether beneficial for the person. In injury the matrix will be torn or inflamed. The body responds by laying down more connective tissue fibers. These patches shorten and thicken the matrix in the affected area. Also, these fibers generally are not laid down in the direction of optimum alignment. If, as is normally the case, the area is kept still or the bones have been misaligned, the new fibers are not given the tensional information that would create normal alignment. In the case of repetitive use, fibers will align according to the tensional demand. If this tensional demand is out of the anatomical norm or asymmetrically displaced, (e.g., more on the extensors of the left leg and extensors of the right arm), then the body will lay down more fibers in these areas and diminish the fibers in the less used areas.

The fixated abnormal alignment of the connective tissue matrix that results from injury and repetitive misuse is always semi-permanent. It is semi-permanent because the matrix will reorganize in response to the next misaligning event. Rolfing® Structural Integration is a hands-on therapy designed to reorganize the connective tissue matrix and create more beneficial relationships within the body and a more balanced structure in general.

The human body is architecturally most like a Tensegrity structure, where weight is distributed through both compression of the hard elements (bone) as well as tension of ligaments, muscle and fascia with a continuity of tension in the connecting of struts and spans. The human body supports itself and holds itself vertical in this manner using the connective tissue matrix to form these connecting elements. In a symmetrical structure, the connective tissue matrix would have a balanced continuity of tension. A tent is an example of a Tensegrity structure. Think of what happens when a tent is not set up with the parts in correct distribution. The same is true in the body; the fascia being the fabric, stretch-chords are like tendons and ligaments, and poles are like the bones. Over time, poor relationships between the structural elements and between these elements and the environmental conditions do not provide the proper support. To the degree that this structure lacks support, it will also lack the ability to adapt to the environment, just as the flapping loosely pitched tent will eventually tear in the wind and collapse.

What is Rolfing® Structural Integration and Alignment (balance)

Structural Integration is concerned with the relationship of bodies to their environment. Normal movement is a sequenced distribution of load through the flexed and extended fascias and between both the left and right sides. This allows for an equal distribution of weight moving from left to right and front to back and vice versa, while maintaining proper anatomical alignment in all joints. The movement flows through the Tensegrity structure to achieve optimum support, balance, adaptation and alignment. Any divergence from this alignment pattern, due to injury or repetitive misuse, will produce anatomically abnormal movement patterns.
Alignment is the basic theme of Rolfing® Structural Integration. The body’s basic capacities of support, lift, continuity and balance all rely upon alignment to express optimum function. The effect of injury to the structures is to produce patterns of shortening, twisting and collapse. Any one injury or repetitive misuse can produce a fulcrum around which the body will re-direct forces away from the alignment and optimum function. With several divergent injuries or misuses, the structure will be driven to accommodate these countervailing forces of misalignment to achieve the best possible alignment for the whole structure. We recognize these as adaptations or compensations. So an injury to the ankle may for instance, may result in chronic low-back pain, a misaligned cervical joint, or other adjustments. These adaptations are themselves adapted to in various parts of the body. Chronic discomfort itself may lead to other physical and emotional behaviors which will be reflected in the structure. Habitual misuse and repetitive physical stresses will also cause a build up of the connective tissue matrix in an abnormal fashion. The structure as a whole becomes a negotiation of countervailing spirals, rotations and side-bends.

We literally become “set in our ways”. One can easily see how for instance the physical habit of favoring a painful knee, or the posture of a person who habitually hangs their head down, will become a pattern. And that this pattern will be an issue for both the mind and the body of its owner. Fascia is what forms and maintains relationships among bones, muscles organs and other tissues. It is by working correctly with fascia that these relationships can be changed.

Most people have the common experience of having restricted movement, joints that don’t function properly and pain. Some may describe these feelings as “being tied up in knots”; others as “low energy”; and of course, these feelings may be reflected in the mental state of the individual. Rolfing® Structural Integration is designed to release areas of strain and rigidity which cause tight muscles, decreased movement through joints and through the body as a whole. Recipients of this technique commonly experience the feeling of more space and freedom in the body, of feeling lighter and moving with more ease.

Broader Implications of the Work

The above general description of Rolfing® Structural Integration provides an introduction to how it developed to help a body to achieve balance and a better relationship with its environment i.e. with gravity. This is done in part, by the manual redistribution of tensional strains and pressures in the body as well as exercises given which are meant to teach the recipient how to move in a way that is less in conflict with gravity. Fascia is the medium of Rolfing® Structural Integration.

Research reported below emphasizes different dimensions of Rolfing® Structural Integration. Two studies randomly allocated subjects between structural integration and control interventions. In the first article by Cottingham, 32 male subjects with an anterior pelvis (above 9 degrees, the average reported for healthy young men) who had previously received ten sessions of structural integration were randomly assigned to receive 45 minutes of structural integration directed at the pelvic areas, iliopsoas, deep hip rotator and hamstring muscles, or to control of 45 minutes in similar supine and sidelying posture without manual intervention. Control subjects showed no change in pelvic angle, heart rate or in parasympathetic nervous tone. Experimental subjects showed immediate decrease in pelvic angle in increase in parasympathetic tone. These changes were equal to one standard deviation immediately after the treatment, and persisted at ¾ of a standard deviation 24 hours later.
Weinberg and Hunt (1979) followed anxiety measures in 48 volunteer students, 24 male and 24 female who were randomly assigned to receive ten one hour sessions of structural integration or no treatment. State anxiety showed no change in the control group, and dropped 10 points in the experimental group. In their reports to the Rolf Institute, their data show that their standard deviation of the anxiety measure is about 10, so they too are showing a strong effect of the intervention.

Perry (1981) documented changes in 10 subjects with cerebral palsy who received ten sessions of structural integration, within one month after the end of treatment and at follow-up of 4-6 months. Six of the ten increased free walking velocity, with improved knee extension at heel contact and increased plantar flexion at toe off. Energy consumption of walking improved in all except the two most severely involved subjects.

Moyer (2004) defined structural integration as a form of massage therapy and included it in his review of research on massage therapy. The studies reviewed here also found decreased anxiety and improved parasympathetic tone with all types of massage, although not as markedly as found in the Cottingham and Weinberg studies.

Basic science studies by Robert Schleip suggest that fascia is able to contract in a smooth-muscle-like manner and thereby influence musculoskeletal dynamics. Immediate fascial responsiveness to manipulation cannot be explained by its mechanical properties alone. Fascia is densely innervated by mechanoreceptors which are responsive to myofascial manipulation. They are intimately connected with the central nervous system and especially with the autonomic nervous system. It has been shown that stimulation of these receptors can trigger changes in ground substance viscosity, in Gamma motor tonus, and in autonomies. The discovery and implications of the existence of intrafascial cells with smooth muscle like contractile properties are of special interest in relation to fibromyalgia, amongst other conditions.

Langevin (2005) shows at the microscopic level how fibroblasts change shape and structure in response to mechanical loading, both in cell culture and in the living animal model. Hujing (1999) reviews literature on myo-tendinous and myofascial force transmission, suggesting that forces are transmitted by paths other than the muscle’s own tendon. These findings have been supported by more recent experimental work. Taken together, these studies form a scientific basis for the clinical practice of structural integration as developed by Dr. Rolf. Dr. Rolf called fascia a “plastic medium”. As a Bio Chemist, she knew that there was something special about connective tissue; namely that by working with it correctly, she could change the whole structure of a body; and in changing the body, you change the mind. What began mostly as esoteric knowledge is finding validity in the scientific community.