# The Fascial Manipulation Technique and Its Biomechanical Model: A Guide to the Human Fascial System

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The Fascial Manipulation Association, an association based in Italy and dedicated to promoting fascial research, presented a full-day workshop titled "The Fascial Manipulation Technique and its Biomechanical Model: A Guide to the Human Fascial System" at the Second International Fascia Research Congress (Vrije University, Amsterdam; October 27-30, 2009).

The premise of this workshop was, first, to illustrate the latest research concerning the gross and histologic anatomy of the superficial and deep fasciae of the human body, considered to be potentially useful in the application of a variety of manual techniques. Second, the workshop was envisioned to explain the biomechanical model for the human fascial system currently applied in the manual technique known as Fascial Manipulation and to present a demonstration of the technique.

This workshop attracted approximately 40 professionals working in remedial massage, physiotherapy, chiropractic, osteopathy, Rolfing, bodywork, physiology, and even philosophy. It was a "sold out" event.

A brief introduction provided background about the development of the three-dimensional biomechanical model for the human fascial system and the related Fascial Manipulation technique. The originator of this model, Luigi Stecco, an Italian physiotherapist, was acknowledged, and the numerous Italian publications[1–4] that preceded his English editions in 2004 and 2009[5,6] were detailed. Dedicated to this lifetime project, Stecco has taught extensively, progressively involving a team of professionals, including his two children, Carla and Antonio. The latter is currently a resident in physical and rehabilitation medicine in Padua, Italy. To coin an apt phrase from Robert Schleip, PhD, an Advanced Certified Rolfer, "It is a truly fascia-nating family!"

Author of more than 30 indexed papers about fascial anatomy, Carla Stecco presented slides of extensive anatomical dissections of unembalmed bodies, carried out in collaboration with the Anatomy Department at Renè Descartes University, Paris. These dissections examine the extrinsic architecture of the human fascial system. The ensuing biomechanical studies analyzed the intrinsic fascial architecture (histologic components, fiber arrangements, innervation of the fascia)[7–11] and a working hypothesis was proposed for the direct involvement of fascia in proprioception and peripheral motor coordination[12,13].

Julie Ann Day then presented the biomechanical model developed by Luigi Stecco. This model helps users to situate themselves within the complexity of the fascial system. Its key premise is that fascia is more than just a uniform membrane, because it presents a specific organization and relationship with the underlying muscles. More specifically, the deep muscular fasciae are seen as

- coordinating elements for motor units (grouped together in myofascial units),
- uniting elements between unidirectional myofascial units (myofascial sequences), and
- connecting elements between body joints through myofascial expansions and retinacula (myofascial spirals).

This biomechanical model, together with the anatomical research, has resulted in important considerations concerning the role of the deep fascia in various myofascial dysfunctions[14,15]. It is hypothesized that any impediment to gliding between endofascial fibers and interfascial planes could cause anomalous tension, and given that many mechanoreceptors are embedded within fascia, altered proprioceptive afferents could then result in non-physiologic movements at joints. Such movements could cause inflammation within the joint of a malfunctioning myofascial unit or pain along a myofascial sequence.

The assessment process used in the Fascial Manipulation method was then summarized. The method is characterized by an analytical procedure that results in personalized treatment for each subject. A combination of codified movement and palpatory tests permits therapists to determine which fasciae are involved in any given dysfunction[16]. The technique

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involves deep manual friction over specific points on the deep muscular fascia that are always at a distance from the actual site of pain. In this way, the method can be applied safely even during the acute phase of a dysfunction. Hyperemia caused by deep friction could modify the extracellular matrix and restore gliding.

Alessandro Pedrelli, a physiotherapist and Fascial Manipulation teacher, then demonstrated an application of the technique. A patient was selected from among 14 participants who had expressed a desire to be treated by earlier completing a form describing a present ailment, with annotations concerning the duration of symptoms and a visual analog scale (VAS) evaluation.

The particular case was a massage therapist who had had a left meniscectomy 4 months earlier, with a good outcome and resolution of symptoms. However, in the last 3 weeks, since she had been traveling and sightseeing extensively in Europe, she had experienced a return of strong medial knee pain in the operated leg (VAS 7/10).

Movement tests evidenced pain in the anteromedial left knee on weight bearing, aggravated by knee flexion. When questioned about previous pain or disturbances, the patient recalled having fractured the fifth metatarsal bone in the left foot several years before. Following a palpatory examination, manipulation of a fascial fibrosis between the first and second metatarsal bone in the left foot permitted her to fully flex her left knee while bearing weight. Another two fascial points were then manipulated in the left anterior thigh and posterior lower leg to complete the treatment.

The interesting results spawned a lively discussion concerning the possible relationship between a previous injury (fracture of left metatarsal bone) and residual fascial adherences that may have limited the patient's ability to adapt to new strains and patterns (that is, sightseeing). It was proposed that treatment of the initial point, at a distance from the site of pain, had produced an immediate change in knee symptoms because of a release of tension along a specific myofascial sequence. It was pointed out that a combination of the symptoms (anteromedial knee pain) highlighted by the movement tests (deep knee flexion), the previous injury, and targeted palpatory examination had led the therapist to examine and treat this point in this particular case as part of a continuity between myofascial sequences, in accordance with Fascial Manipulation theory.

The workshop concluded with highlights from recent anatomical studies of the superficial fasciae. The exact definition of superficial fascia is still an object of debate, with some authors using the term for the whole of the subcutaneous tissue. Others use it to refer to one or the other of the subcutaneous tissue layers. Some authors admit the existence of a membranous layer splitting the subcutaneous tissue; others exclude it; and yet others describe multiple layers. Our studies revealed the constant presence of a membranous layer of connective tissue of variable thickness within the subcutaneous tissue. We propose that two fat layers (superficial and deep) exist in the subcutaneous tissue and that a membranous layer, to which the term "superficial fascia" should be correctly applied, separates these two fat layers. Retinacula connect this superficial fascia layer to the skin and to the deep fascia, forming a three-dimensional network between the fat lobules. The superficial fascia is homologous to the cutaneous muscle layer (panniculus carnosus) found in other mammals. Indeed, in humans, muscular fibers can also be found in the layer of the superficial fascia, particularly in the neck (platysma muscle), the face (superficial muscular aponeurotic system), the anal region (external anal sphincter), and the scrotum (dartos).

The superficial fascia layer itself is formed by loosely packed, interwoven collagen fibers mixed with abundant elastic fibers. Many nerve fibers can be highlighted within the superficial fascia, and this may indicate participation in the exteroceptive system. Thicker in the trunk than in the limbs, this layer becomes thinner toward the extremities of the limbs. The superficial fascia adheres to the deep fascia over bony prominences and at some ligamentous folds. In some regions, the superficial fascia splits, forming special compartments around major subcutaneous veins and lymphatic vessels, and extending fibrous septa that attach to the vessel wall. Functionally, the superficial fascia may play a role in the integrity of the skin and in supporting subcutaneous structures (particularly veins and lymphatic vessels) by ensuring their patency. In accordance with these anatomical findings, the implications of the superficial fascia in lymphatic and venous return mechanisms were discussed.

This workshop presented a general vision of the human fascial system and a new way to evaluate musculoskeletal dysfunctions, with specific reference to the Fascial Manipulation technique. The format was accessible to a variety of clinicians working with fascial diseases, providing for an enriching exchange of opinions between various professional figures.

KEYWORDS: Fascia, fascial anatomy, Fascial Manipulation technique, manual therapy

## CONFLICT OF INTEREST NOTIFICATION

The author declares that there are no conflicts of interest.

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