#### Luigi Stecco – Antonio Stecco

# FASCIAL MANIPULATION®

Practical Part • First Level

Second edition

Foreword by ROBERT SCHLEIP, PHD Director, Fascia Research Project Ulm University, Germany

English translation by JULIE ANN DAY



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#### **Foreword**

Welcome to an exciting new field in musculoskeletal therapy: the fascinating world of fascia. Fascia forms a continuous tensional network throughout the human body, covering and connecting every single organ, every muscle, and even every nerve or tiny muscle fiber. After several decades of severe neglect, this ubiquitous tissue has transformed from the "Cinderella of orthopaedic science" into an almost super star position within medical research. Starting with the first few years of this 21st century, the number of research papers on fascia in peer-reviewed journals experienced an almost exponential increase. The 1st International Fascia Research Congress, held at the Harvard Medical School in October 2007, was celebrated with worldwide acknowledgement. Similar to the rapidly growing field of glia research in neurology, there is now a global recognition that this underestimated contextual tissue plays a much more important role in health and pathology than was estimated during previous decades.

As every medical student knows and every doctor still remembers, up to now, fascia has been introduced in anatomy dissection courses as the white packing stuff that one first needs to clean off, in order "to see something". Similarly, anatomy books have been competing with each other in just how clean and orderly they present the locomotor system, by cutting away the whitish or semi-translucent fascia as completely and skilfully as possible. While students appreciate these appealing graphic simplifications, with shiny red muscles, each attaching to specific skeletal points, frustration is certain when these simplified maps have almost nothing to do with how the real body feels and behaves, be it in medical surgery or during therapeutic palpation.

Muscles hardly ever transmit their full force directly via tendons into the skeleton, as is usually suggested by our textbook drawings. They rather distribute a large portion of their contractile or tensional forces onto fascial sheets.

These sheets transmit these forces to synergistic as well as antagonistic muscles. Thereby they stiffen not only the respective joint, but may even affect regions several joints further away. If we look closely at the two powerful muscles gluteus maximus and tensor fascia lata, both insert into the dense fascial sheet along the lateral thigh, called the iliotibial tract. This tissue is part of the fascial envelope of the thigh, called fascia lata, whose tension influences not only the stiffness of the lateral hamstrings and quadriceps, but also severely effects the behaviour of the knee joint and the whole lower leg.

The simple questions discussed in musculoskeletal textbooks "which muscles" are participating in a particular movement thus become almost obsolete. Muscles

are not functional units, no matter how common this misconception may be. Rather, most muscular movements are generated by many individual motor units, which are distributed over some portions of one muscle, plus other portions of other muscles. The tensional forces of these motor units are then transmitted to a complex network of fascial sheets, bags, and strings that convert them into the final body movement. Into how many 'muscles' each of them has been divided by our historical textbook authorities, depended more or less on their manual skills with the dissection knife. Their distinctions have little to do with the question about which movements these structures can perform.

Similarly, it has been shown that fascial stiffness and elasticity plays a significant role in many ballistic movements of the human body. First discovered by studies of the calf tissues of kangaroos, antelopes, and later of horses, modern ultrasound studies have revealed that fascial recoil plays in fact a similarly impressive role in many of our human movements. How far you can throw a stone, how high you can jump, how long you can run, depends not only on the contraction of your muscle fibers; it also depends to a large degree on how well the elastic recoil properties of your fascial network are supporting these movements.

If the architecture of our fascial network is indeed such an important factor in musculoskeletal behavior. one is prompted to ask why this tissue has been overlooked for such a long time? There are several answers to this question. One aspect has to do with the development of new imaging and research tools, which now allow us to study this tissue in vivo. Another reason is the degree to which this tissue resists the classical method of anatomical research: that of splitting something into separate parts that can be counted and named. You can reasonably estimate the number of bones or muscles; yet any attempt to count the number of fasciae in the body will be futile. The fascial body is one large networking organ, with many bags and hundreds of rope-like local densifications, and thousands of pockets within pockets, all interconnected by sturdy septa as well as by looser connective tissue lavers.

This 'non graspability' of fascia is also reflected in the use of many different terminologies throughout literature, describing which exact tissue types are included under the term "fascia". Whether the thin intramuscular endomysium or the superficial fascia can be regarded as fascia (or rather as loose connective tissue), or whether only dense irregular connective tissue sheets should be included, seems to depend on the individual perspective of each author. Let me therefore introduce you to the newly proposed definition of fascia proposed at the first Fascia Research Congress. The term 'fascia'

here describes the soft tissue component of the connective tissue system that permeates the human body. This includes not only dense planar tissue sheets (like septa, joint capsules, aponeuroses, organ capsules, or retinacula), which may be also called "proper fascia", but it also encompasses local densifications of this network in the form of ligaments and tendons. In addition, it includes softer collagenous connective tissues like the superficial fascia or the innermost intramuscular layer of the endomysium.

While not everybody will be happy with this new terminology, it offers many important advantages for the field. Rather than having to draw – most often arbitrary – demarcation lines between joint capsules and their intimately involved ligaments and tendons (as well as interconnected aponeuroses, retinacula and intramuscular fasciae), fascial tissues are seen as one interconnected tensional network that adapts its fiber arrangement and density according to local tensional demands. This terminology fits nicely to the Latin root of the term "fascia" (bundle, bandage, strap, unification, binding together) and is synonymous with the non-professional's understanding of the term "connective tissue" (in contrast to medical and biological scientists that include cartilage, bone and even blood as connective tissue).

The dynamic field of fascia research, to which the authors of this book contribute significantly, has shown in several ways that fascia is much more 'alive' than was previously assumed. Aliveness has at least two aspects here. One is its capacity to actively contract, as laboratory work with rat and human fascia by our group (Fascia Research Project, Ulm University, Germany) and the group working with Ian Naylor (Bradford University, U.K.) has shown. The other aspect is its quality as a sensory organ. It has been shown that fascia is densely innervated with many sensory nerve endings including mechanoreceptors and nociceptors, which can become the source for acute myofascial pain syndromes. Fascia, if understood in the wider definition of the term described above, is one of our richest sensory organs. It is for sure our most important organ for proprioception and for our "sense of embodiment".

The Stecco family, two of which are authors of this book, have become a driving force in this new field. Their first book "Fascial Manipulation for Musculoskeletal Pain" (Piccin, 2004) already attracted worldwide attention, and was quickly passed around from one myofascial therapist and bodywork instructor to another. It was therefore not a large surprise that their presentation at the Harvard Fascia Congress in 2007 was honoured with a special award for its scientific quality and depth of implications. I have no doubt that this new book, which not only deepens the theory and anatomical details of the first book but also presents a precise description of their therapeutic technique, will have a major impact upon the whole field of manual therapy.

The authors present a novel model concerning the contribution of fascia to neuromuscular coordination through a specific topography of centers within the fascial network (centers of coordination, centers of perception, and centers of fusion). While this is a completely new model, it is presented in a very convincing manner. The evidence given in this book in support for this intriguing model, covers not only corroborating phylogenetic and neurophysiological details, but includes thousands of hours of anatomical cadaver research, performed by the original founder of this

approach, Luigi Stecco, as well as his daughter Carla Stecco MD and son Antonio Stecco MD. Their diligent cadaver studies have resulted in several new anatomical discoveries and descriptions, published in peer-reviewed scientific anatomical journals. Anybody who has followed the emerging new publications on fascia in the scientific literature in the last few years will have noticed these important contributions. This family team has studied fascial morphology and topography in detail, which is not only impressive but also resulted in the novel descriptions and findings that support the new model for neurofascial coordination presented in this book.

While these findings add great credibility to their work, further research will be needed to convince the scientific community of the full validity of this new concept. Whatever these coming years will bring up, whether in support of or in extension to the specific predictions made in this historical book, these will be exciting years. The contributions given to the worldwide community by the Stecco family, as well as by several other fascia inspired groups, have already motivated some of the world's leading experts in musculoskeletal medicine to enter the field of fascia research themselves. For example, Prof. Siegfried Mense, muscle pain expert from Heidelberg University, recently started to include the lumbar fascia in his innervation and nociception studies and already found some 'very interesting details' which he will soon publish. Similarly, Helene Langevin MD, renowned acupuncture researcher in Vermont, is currently using ultrasound to compare fascial morphology between chronic back pain and healthy people.

One of the treasures of this book is the large number of cadaveric photos showing topographical anatomy details of fascia. These are extremely well done and display some local properties that have never been described in such detail. Nevertheless, let me remind you, that these pictures, as beautiful as they are, show a much drier body than the one you are living in and the one you are touching in your clients. Please keep the fluid dynamics of the living body in mind and in your touch, when you turn from this book to the properties of fascia in a real living person. Fascia in living bodies is much more slippery and moist than you may tend to imagine.

If you are a beginner within the field of physiotherapy (or orthopaedics, rehabilitation, movement therapy, etc), be prepared that this is not a book to skim over lightly while watching TV. It is a gold mine of condensed information. If you mistakenly skip over a sentence, it may easily occur that you will miss this information later, when trying to understand the logic of the following pages, as there is not much redundancy in this book. Yet I give you my word that even most experts in this field will look at and read this book with immense excitement and a state of joyful discovery. While other books have been written on fascia from several different angles, this one clearly sets a new standard. My congratulations to the authors for completing the most valuable and richest book that has ever been published on fascial manipulation; and also to your dear reader for having chosen this very book in order to learn more about a truly fascinating tissue and its manipulation.

> Robert Schleip PhD Director, Fascia Research Project Ulm University, Germany

### Introduction

This book has been developed in order to provide assistance to students attending Fascial Manipulation courses.

Essential information for understanding the anatomy and physiology of the fascia is presented in the first two chapters, as well as advice on carrying out a treatment and how to fill in an assessment chart.

The third to the eighth chapters present the myofascial units (mf unit) that move the various body segments on the three spatial planes.

Each mf unit has a Centre of Perception (CP), which corresponds to the area where a patient feels, or perceives, their pain, and a Centre of Coordination (CC), which corresponds to the origin of the joint dysfunction.

Each CC is located at a distance from its relative CP and it is only painful on palpation.

The site of pain, or CP, is located over the joint that is moved by the mf unit.

Six mf units coordinate and move each joint: namely, the mf units of antemotion, retromotion, lateromotion, mediomotion, intrarotation, and extrarotation.

Whenever a joint is painful, movement verifications are required to identify the mf unit responsible for this joint pain, or dysfunction. These movement verifications are not individual muscle tests. They evaluate the overall performance of the bone-nerve-myofascial complex, or mf unit, as it moves a segment in a specific direction.

After experiencing Fascial Manipulation, many patients remark, "this is not a massage!". In effect, it involves deep pressure over specific areas (CCs), necessary for identifying fascial alterations. Having isolated a fascial alteration, manipulation is performed for several minutes, using the knuckles or elbows, until the pain disappears and an immediate improvement in joint function is obtained.

The initial treatment session begins with the recording of the patient's data, including the movement that aggravates the patient's pain. As each mf unit moves a segment in a specific direction, this information is a useful for hypothesising the involvement of a particular mf unit.

A hypothesis always has to be validated by the movement verification prior to proceeding to palpation verification. During movement verification, the patient is asked to perform the painful movement that they had described during history taking. At the end of the treatment session, the patient is invited to perform this same movement again in order to evaluate the post-treatment results. Whenever pain is distributed in a number of segments it is useful to identify the spatial plane involved and the myofascial sequences along

which these various pain sites are distributed. In these cases, the patient is invited to perform movement verifications of the more mobile body segments.

Numerous anatomical illustrations have been included in this book in order to facilitate the recognition of the points, or CCs, where the palpation verification and treatment are performed.

In the third chapter, the anatomical illustrations depict the three CCs that carry out the movement scheme of ante-medio-intra for each body segment. As this third chapter is dedicated to the sequence of antemotion, the reader will examine, above all, the monoarticular and biarticular fibres that converge in the CCs of antemotion (an). The sequence of mediomotion is presented in the fifth chapter and the sequence of intrarotation is presented in the seventh chapter; therefore, the student will need to refer to the anatomical illustrations in the third chapter to find the muscles involved in the formation of the CCs of medio and intra. This strategy has been adopted in order to present the respective locations of the three anterior CCs of the various body segments only once.

The three CCs that carry out the movement scheme of retro-latero-extra in each body segment are presented in the fourth chapter. As this chapter is dedicated to the sequence of retromotion, the reader will examine, above all, the monoarticular and biarticular fibres that converge in the CCs of retromotion. The sequence of lateromotion is presented in the sixth chapter and extrarotation in the eighth chapter. Therefore, to find the muscles involved in the formation of the CCs of latero and extra, readers will need to refer to the anatomical illustrations in the fourth chapter.

In the fifth chapter, the anatomical illustrations depict the three anterior CCs of the segment under discussion, together with the three CCs of the distal adjacent segment. This choice has been made in order to train the student to carry out a longitudinal palpation verification of the three CCs of ante-medio-intra along the same sequences, and to not only palpate in a horizontal direction. It should be noted that while the site of pain is always manifest, its origin is always hidden or silent; therefore, time dedicated to palpation verification is never time wasted.

In the sixth chapter, the anatomical illustrations depict the three posterior CCs of the segment under discussion, together with the three CCs of the distal adjacent segment. The reader will refer to these illustrations when they study the CCs in the fourth and eighth chapters. In pathological states, both of the CCs indicated along the same sequence are often 'active' (densified and/or painful).

In the seventh chapter, the anatomical illustrations

depict a cross section of each segment and all the six CCs of this segment are analysed. In particular, this chapter takes into consideration the three CCs of ante-medio-intra. In these cross sections, it should be noted that the location of the CCs may be slightly more proximal or distal with respect to where they are illustrated. Nevertheless, each CC is duly reported in order to demonstrate its relationships with the septa and the underlying muscles, as well as its position with respect to the antagonist CC. In some illustrations (7.20, 7.50, 7.60, etc.), arrows have been added to highlight the specular disposition of the agonist CC with respect to the antagonist CC.

In the eighth chapter, the cross sections are dedicated to the explanation of the three CCs of retro-latero-extra. The CCs of this movement scheme are arranged in the posterior part of the limbs and trunk.

The ninth chapter is dedicated to the presentation of the movement and palpation verifications. The movement verification is called 'comparative' because it sequentially tests the six mf units of the more mobile body segments. The comparative palpation verification compares the CCs on one side of the body with those on the opposite side of the body.

Where the palpation verification is explained in the third to eighth chapters, the acupuncture point that corresponds to the CC is also reported between brackets. This additional information is useful because some CCs correspond to two or three acupuncture points. In these cases, palpation verification should address the

principal CC first, followed by the proximal point (p) and distal (d) points. For example, the CC of retro-talus (re-ta) is located in the myotendinous convergence of the two gastrocnemii; this point corresponds to the acupuncture point BL 57. Given that retromotion of the talus segment is carried out along the sagittal plane for several degrees of movement, the CC can be more proximal, such as between the muscle bellies of the gastrocnemii (BL 56) or more distal, such as over the muscle belly of soleus (BL 58). If only the principal CC point (BL 57) is treated, then re-ta is recorded on the assessment chart; if the more proximal part of the CC is treated (BL 56), then re-ta p is recorded on the assessment chart.

In the trunk, where each vertebra is moved by its own deep muscles, each principal CC can also be shifted slightly, either in a proximal or a distal direction.

These variables of the principal CCs are presented in this text because they allow for a greater degree of freedom during palpation verification, making it less confined to pre-established limits.

The previous edition of this text lacked anatomical illustrations. Thanks to anatomical drawings taken from 'Istituzioni di Anatomia dell' Uomo' (G. Chiarugi & L. Bucciante), this new edition is well illustrated, and we would like to thank the editor (Piccin) for permitting use of these illustrations.

The Authors

## Contents

Abbreviations	ΧI	Mf unit of retro-thorax	116
1. Anatomy of the fascia Histology		Mf unit of retro-lumbi	118
	4	Mf unit of retro-pelvis	120
of the fascia Biomechanical model		Mf unit of retro-coxa	122
Anatomy of the fascia	2	Mf unit of retro-genu	124
Histology of the fascia	13	Mf unit of retro-talus	126
Biomechanics of fascia	22	Mf unit of retro-pes	128
		Mf unit of retro-scapula	130
2. Physiology of the fascia Myofascial		Mf unit of retro-humerus	132
pain FM Assessment chart	35	Mf unit of retro-cubitus	134
Physiology of the fascia	36	Mf unit of retro-carpus	136
Myofascial pain	48	Mf unit of retro-digiti	138
FM assessment chart	56	Treatment strategies for	
TW d3c33ment chart	50	the retromotion sequence	140
3. The myofascial sequence		5. Myofascial sequence	
of antemotion	73	of mediomotion	1/11
Mf unit of ante-caput 1	74		
Mf unit of ante-caput 2	76	Mf unit of medio-caput 1	142
Mf unit of ante-caput 3	78	Mf unit of medio-caput 2	144
Mf unit of ante-collum	80	Mf unit of medio-caput 2 retro	145
Mf unit of ante-thorax	82	Mf unit of medio-caput 3	146
Mf unit of ante-lumbi	84	Mf unit of medio-caput 3 retro	147
Mf unit of ante-pelvis	86	Mf unit of medio-collum	148
Mf unit of ante-coxa	88	Mf unit of medio-collum retro	149
Mf unit of ante-genu	90	Mf unit of medio-thorax	150
Mf unit of ante-talus	92	Mf unit of medio-thorax retro	151
Mf unit of ante-pes	94	Mf unit of medio-lumbi	152
Mf unit of ante-scapula	96	Mf unit of medio-lumbi retro	153
Mf unit of ante-humerus	98	Mf unit of medio-pelvis	154
Mf unit of ante-cubitus	100	Mf unit of medio-pelvis retro	155
Mf unit of ante-carpus	102	Mf unit of medio-coxa	156
Mf unit of ante-digiti	104	Mf unit of medio-genu	158
Treatment strategies for	400	Mf unit of medio-talus	160
the antemotion sequence	106	Mf unit of medio-pes	162
		Mf unit of medio-scapula	164
4. Myofascial sequence		Mf unit of medio-humerus	166
of retromotion	107	Mf unit of medio-cubitus	168
Mf unit of retro-caput 1	108	Mf unit of medio-carpus	170
Mf unit of retro-caput 2	110	Mf unit of medio-digiti	172
Mf unit of retro-caput 3	112	Treatment strategies for	
Mf unit of retro-collum	114	the mediomotion sequence	174

6. The myofascial sequence		Mf unit of extra-scapula	266
of lateromotion	175	Mf unit of extra-humerus	268
Mf unit of latero-caput 1	176	Mf unit of extra-cubitus	270
Mf unit of latero-caput 2	178	Mf unit of extra-carpus	272
Mf unit of latero-caput 3	180	Mf unit of extra-digiti	274
Mf unit of latero-collum	182	Treatment strategies for	
Mf unit of latero-thorax	184	the extrarotation sequence	276
Mf unit of latero-lumbi	186		
Mf unit of latero-pelvis	188	9. Movement and palpation	
Mf unit of latero-coxa	190	verifications	277
Mf unit of latero-genu	192	Comparative movement verifications	278
Mf unit of latero-talus	194	Comparative movement verifications	
Mf unit of latero-pes	196	in the trunk: cervical segment	279
Mf unit of latero-scapula	198	Comparative movement verifications	
Mf unit of latero-humerus	200	in the trunk: lumbar segment	280
Mf unit of latero-cubitus	202	Movement verifications of the trunk	
Mf unit of latero-carpus	204	sequences against resistance	281
Mf unit of latero-digiti	206	Shortcuts for the trunk	282
Treatment strategies for		Postural examination of the trunk	283
the lateromotion sequence	208	Comparative movement verifications	
		in the lower limb: coxa segment	284
7. The myofascial sequence		Comparative movement verifications	
of intrarotation	209	in the lower limb: talus segment	285
		Movement verifications of the lower	
Mf unit of intra-caput 1  Mf unit of intra-caput 2	210	limb sequences against resistance	286
Mf unit of intra-caput 3	<ul><li>212</li><li>214</li></ul>	Shortcuts for the lower limb	287
Mf unit of intra-caput 3	214	Examination of alignment in the lower limb	288
Mf unit of intra-condin	218	Comparative movement verifications	200
Mf unit of intra-lumbi	220	in the upper limb: humerus	289
Mf unit of intra-pelvis	222	Comparative movement verifications	200
Mf unit of intra-coxa	224	in the upper limb: carpal segment	290
Mf unit of intra-genu	226	Movement verifications against resistance of the upper limb sequences	291
Mf unit of intra-talus	228	Shortcuts for the upper limb	291
Mf unit of intra-pes	230	Examination of deviations in the upper limb	293
Mf unit of intra-scapula	232	Comparative palpation verifications	294
Mf unit of intra-humerus		Ocular segment CP 1 bi	295
Mf unit of intra-cubitus	236	Maxillary segment CP 2 bi	296
Mf unit of intra-carpus	238	Mandibular segment CP 3	297
Mf unit of intra-digiti	240	Cervical segment CL	298
Treatment strategies for		Longitudinal comparative verification:	
the intrarotation sequence	242	thorax-lumbi segments TH LU	299
		Longitudinal comparative verification:	
8. The myofascial sequence		lumbi-pelvis segments LU PV	300
of extrarotation	243	Longitudinal comparative verification:	
		coxa-genu segments CX GE	301
Mf unit of extra caput 2	244	Talus segment TA	302
Mf unit of extra caput 2	246	Pes segment PE	303
Mf unit of extra-caput 3	248 250	Scapula segment SC	304
Mf unit of extra-tonum	252	Humerus segment HU	305
Mf unit of extra-tilorax	254	Cubitus segment CU	306
Mf unit of extra-pelvis	256	Carpus segment CA	307
Mf unit of extra-coxa	258	Digiti segment DI	308
Mf unit of extra-genu	260		
Mf unit of extra-talus	262	Conclusion	309
Mf unit of extra-pes	264	References	310

# **Abbreviations**

***  1xm  an  An-ca  An-cl  An-cp  An-cu  An-cx  An-di  An-ge  An-hu  An-lu  An-pe  An-pv  An-sc	Maximum intensity of symptoms Maximum benefit or outcome Symptoms aggravate once a month ante, antemotion, forward movement Ante-carpus or wrist flexion Ante-collum or forward flexion Ante-caput, with three mf sub-units Ante-cubitus or elbow flexion Ante-coxa or hip flexion Ante-digiti or closing of fingers Ante-genu or knee extension Ante-humerus or shoulder flexion Ante-lumbi or forward roll from supine Ante-pes or dorsiflexion of big toe Ante-pelvis or anterior pelvic rock Ante-scapula or forward movement	La -ta La -th LI Lu LU Lt LV m me Me-cl Me-di Me-hu Me-ta mf mn nt	Latero-talus, lateral stability Latero-thorax, side bending Large intestine meridian Lumbi, lumbar region Lung meridian Left, limb or side of body Liver meridian Month, time since pain onset Medio, mediomotion, medial Medio-collum, neck alignment Medio-digiti, fingers to midline Medio-humerus, shoulder adduction Mediomotion talus, medial deviation Myofascial: unit, sequence, spiral Morning, pain and rigidity worse in Night, pain worse during the night
An-ta An-th bi ca CC cl cont. CP cp cu cx d d, 1d di er Er-ta GB Ge HT hu ir Ir-ta KI la La -ca La -cu La -cy La -cy La -cy La -hu	Ante-talus or dorsiflexion of ankle Ante-thorax or bending forward Bilateral, both right and left Carpus, wrist Centre of coordination of a mf unit Collum, cervical region Continuous, unrelenting pain Centre of perception of a mf unit Caput, face and cranium Cubitus, elbow Coxa, thigh-hip Distal, in a caudal direction Day, 1 day since trauma Digiti, fingers, I-II-III-IV-V Extra, extrarotation, supination Extrarotation of talus, eversion Gall bladder meridian Genu, knee Heart meridian Humerus, more distal part of shoulder Intra, intrarotation, inversion Intrarotation talus, inversion of ankle Kidney meridian Latero, lateromotion, lateral flexion Latero-carpus, outward wrist movement Latero-collum, lateral flexion of neck Latero-caput, looking to one side Latero-cubitus, lateral stability of elbow Latero-digiti, stretch fingers wide Latero-genu, lateral stability of the knee Latero-humerus, shoulder abduction	p PC PaMo pe pm Prev pv re rec Re-ca Re-cl Re-cp Re-cu Re-cx Re-lu Re-pe rt sc SI SiPa SP ST Ta TE Th TP VC VG y, 10y	Proximal, in a cephalic direction Pericardium meridian Painful Movement Pes, tarsus, metatarsus, and toes Afternoon, pain worse in Past pain, pain no longer present Pelvis, pelvic girdle Retro, retromotion, backwards Recurrent, pain that reoccurs Retro-carpus, wrist extension Retro-collum, neck extension Retro-collum, neck extension Retro-cubitus, elbow extension Retro-digiti, ulnar deviation of 5th finger Retro-genu, knee flexion Retro-humerus, shoulder extension Retro-lumbi, extension of lumbar region Retro-pes, plantarflexion Right, limb or side of body Scapula, proximal part of shoulder Small intestine meridian Site of Pain, as indicated by patient Spleen-pancreas meridian Stomach meridian Talus Triple heater meridian Thorax Trigger Point Conception vessel meridian Governing vessel meridian Year, 10 years since pain began