Translating fascia research into techniques you can use

by Bethany Ward and Larry Koliha, Certified Advanced Rolfers

Which therapist is more effective - one who knows the science underlying our work or one who has a well-developed intuition, and is able to sense and respond to subtle, possibly unquantifiable cues? We've noticed that many practitioners proudly lean to one side or other of this fence but we maintain that, not only do you **not** have to choose between scientific knowledge and intuition, it is actually ideal if you don't. Incorporating scientific input and developing a deeper 'knowing' are highly complementary pursuits.

This is the first of a two-part article. We'll be discussing some of the latest fascia research that applies to manual therapies and demonstrate how you can use this information to select techniques that target a variety of soft tissue changes. In particular, fascia plays a critical role in low back pain so we have focused on techniques that address this common issue.

What is fascia - really?

Until recently, this form of connective tissue has been the poor stepchild of the scientific and medical communities. When considered at all, fascia has generally been dealt with in fragmented parts - as ligaments, tendons or, occasionally, as wrappings of muscles in compartmental syndromes. For the most part, Western medicine has treated fascia as inert packing material that fills in the places between the 'important' parts such as muscles, bones and organs. This outlook is evident in the dearth of research devoted to the subject, at least until recently.

In the last three decades, fascia research has increased more than six-fold. So much so, that two noted Rolfing™ practitioners, Thomas Findley (MD, PhD) and Robert Schleip (PhD) convened the first Fascia Research Congress on the Harvard University campus in 2007. The objective was to bring together fascia scientists and clinicians to inform each other's work. The congress was only intended to be a one off but it was so successful that a second was held in Amsterdam in 2009. Future meetings are to be held every three years, with the next congress planned for March 28-30, 2012 in Vancouver, Canada.

How do we change fascia?

Therapists who work with fascia witness therapeutic changes every day. We know we're affecting the connective tissue and we have ideas about the mechanisms. But the truth is that, until we started working with researchers, a lot of our understanding was educated guesswork.

Research presented at the Second International Fascia Congress suggests that there are three main ways that our work may be most effective in changing fascia:

1) Focusing on areas that cause tension in fascia (for example, adhesions, fibroses and scars)
2) Taking a global view of the body in our assessments, touch and treatment
3) Choosing interventions based on the type of mechanoreceptors in the area you are working and your intended outcomes.

Let's look at these a bit more closely.

Targeting areas that cause tension in fascia

A study examining the effects of stretch on areolar or 'loose' connective tissue found significant remodeling of the fibroblast cells, which make up fascia, in response to only 20 minutes of tension (Langevin, 2009). Based on this work, we can extrapolate that areas that put constant tension in the fascial web are remodeling the tissue and creating significant changes in its structure.

Therefore, it makes sense to direct our therapeutic efforts at areas of scarring, fibrosis and inflammation to rebalance areas of chronic tension in fascia.

Areolar connective tissue is the most widespread connective tissue in the body. In addition to filling the spaces between organs and surrounding and supporting blood vessels, this tissue attaches the skin to underlying tissue. As such, fibrosis can cause strain patterns in the body the same way a seam changes the pull through a piece of cloth.

After appropriate preparation, you should address fibroses and scar tissue early in your sessions, leaving time to integrate these changes throughout the system. How do you know if you've accomplished your goal? Test before and after your interventions. Improved range of motion, smoother function or increased comfort are good indicators that you are creating more balance in the fascial matrix.

Include a global view in assessments, touch and treatment

Although a global view of fascia is a novel addition to conventional thinking, it has long been a favoured approach among many holistic therapists. Perhaps one of the reasons connective tissue has been misunderstood is because it doesn't lend itself to reductionism, in either dissection or classification. There are almost no discrete ligaments in the body: all but two have to be 'created' by the dissector's scalpel (van der Wal, 2009). Although researchers distinguish between a dozen types of fascia (Langevin & Huijing, 2009), the fascial system is actually composed of a single piece which wraps, permeates and envelopes all other structures under the skin. So, as a myofascial therapist, you need to be feeling through the body to assess and monitor how forces are transmitted.

The research is showing that, not only can fascia not be separated into parts, but also that its function is inseparable from the function of muscle. A study of muscles in the lower leg found that, when a muscle contracts, its tendons actually lengthen and store energy that is released when the muscle relaxes, making gait more efficient (Kawakami, 2009). It is highly likely that this relationship occurs in other parts of the body, making the interplay between fascia and muscle important in energy transfer between tissues. We are just beginning to understand this relationship but it appears that, when we move in ways that create smoother, more graceful movements, we are training this elastic recoil property in our fascia.

Choosing interventions based on mechanoreceptors and intended outcomes

A particularly interesting area of fascia research has to do with mechanoreceptors, the sensory receptors that respond to mechanical pressure or distortion. Robert Schleip has been researching the relationship between mechanoreceptors and fascial tonicity. He is a leader in the field of addressing sensory receptors via bodywork to affect tissue tone, body awareness and deeply established movement patterns. We are extremely indebted to Dr Schleip for his generous sharing of research and ideas.

Because fascia research has been very limited in the past, we are still learning basic information about its properties and composition. Researchers' discoveries are opening up new methods for creating long-term change in clients' structures. Manipulation of mechanoreceptors in the fascia is an extremely valuable tool that can significantly inform the way we work.

The rest of this article and the one that follows will be devoted to discussing four types of mechanoreceptors found in fascia (Golgi, Paccini, Ruffini and Interstitial receptors); their locations; the effects they can produce in the body; and the kinds of touch required to achieve these outcomes.

We also demonstrate a technique for each receptor type, using the example of back pain as a common presenting condition, to underscore the practical applications of the research in hands-on treatment.

Choosing techniques to stimulate receptor types

When selecting techniques for a session, remember to first prepare the client and the area to be worked then follow up with more targeted techniques that differentiate tissue and, lastly, leave time at the end of the session for integration techniques that help the client to incorporate and embody any shifts that have taken place.

This article will cover Paccini and Golgi receptors and associated techniques. The next instalment will address Interstitial and Ruffini receptors.

Paccini Receptors: Vertebral Mobility Technique

Work with Paccini receptors can increase local proprioceptive attention and self-regulation. These receptors are inherent to your clients' experience of inhabiting their bodies so techniques that stimulate them are appropriate for both preparing and integrating phases of your work. Located in deep capsular layers, spinal ligaments and myotendinous junctions, Paccini receptors respond to the high velocity adjustments of chiropractic; the sudden pressure release techniques common to osteopaths; and to vibratory tools, rocking, shaking and rhythmic joint compression.

▲ **Image 1:** In the Vertebral Mobility technique, gently grip the spinous process between fingers and thumbs. Image courtesy ActionPotential, Inc.

Although high velocity adjustments are not in the scope of practice of massage therapy, there are many other options available to target these receptors. Your purpose is to wake up the Paccini receptors and techniques that provide fairly quick, unpredictable movements deep inside the joint capsule are most effective. Keep your intention open and inquisitive, rather than directed and expectant. Your aim is to help the client's nervous system 'look around' and get reacquainted with areas where awareness may have become reduced.

Because people tend to reinforce movement patterns that are often focused on the space directly in front of them (for example, computer work, rushing to the next appointment, conversing with others), proprioception in areas of the spine and back often becomes diminished. This can introduce imbalanced body use and create self-perpetuating movement patterns that contribute to chronic back pain. Stimulating Paccini receptors can help your clients reset these sensors to provide more accurate information and new movement options.

The technique

To perform the Vertebral Mobility technique, start with the client prone and lightly grip (don't squeeze) a spinous process between your thumbs and fingers (Image 1). With your feet well-grounded and knees unlocked, gently rock the vertebra fairly perpendicularly to the spine (Image 2). Initially, you're observing if the vertebrae rotates right or left. If there isn't balanced movement in both directions, keep rocking in varying directions and notice if it releases.

After you've felt a response, move to an adjacent vertebra and repeat. Although you can use this technique along the length of the spine, in terms of stimulating Paccini receptors it is probably most effective to work sections of vertebrae that have become undifferentiated in the client's awareness. Look for sections of vertebrae that appear 'quiet' during gait or areas your client doesn't move through during normal activities. These still areas are common in clients suffering with back pain.

▲ **Image 2:** With feet well-grounded, rock the spinous process and observe its movement.
Image courtesy ActionPotential, Inc.

Paccini receptors become desensitised to repeated movements so change the direction of your input every two or three repetitions. You are talking to the client's nervous system at a very deep level. Your unspoken intention is to reacquaint the client with parts of the body they may not have visited recently. Keep a sense of curiosity: How does this vertebra like to move? What is it doing now?

Paccini techniques are subtle but can profoundly impact local proprioception and long-held movement patterns. Draw the nervous system's attention to an area and let it determine if it is ready to reintroduce this feedback.

Golgi Receptors: Quadratus Lumborum Technique

Stimulating Golgi receptors is a powerful tool for improving proprioception and decreasing muscular tonus. We all have clients who have muscles that seem to have forgotten how to relax. Even when they consciously relax an area, the muscle is still firing at some level. If this is the case, go for the Golgi.

Golgi receptors are abundant at myotendinous junctions, aponeurosis attachments, peripheral joint ligaments and joint capsules, so these are locations to target. These receptors respond to slow, deep, stretching techniques performed close to attachment sites.

Golgi tendon organs have been shown to be unresponsive to passive stretching (Jami 1992) so eliciting slow active client movements during manipulation will increase the relaxation of local muscle tone.

The technique

For clients with low back pain, addressing iliac crest attachments is key. In this side-lying technique, it is important to position the client so the shoulders and hips are stacked vertically (not rolling forward or back). Bent knees can act like a kickstand, allowing the client to stabilise and relax into the position.

▲ **Image 3:** To release the quadratus lumborum, contact the edge of the iliac crest and slowly lean to apply pressure in a medial caudal direction.
Image courtesy ActionPotential, Inc.

With a soft fist (relax your hand as much as possible), use the edge of your knuckles to make contact with the superior attachments of the iliac crest (Image 3). Apply pressure in a medial and caudal direction by gradually leaning into the attachments until you meet resistance. Your intention is to create length and softening of these tissues so using your other hand to create traction will facilitate this. Keep your pressure in a caudal direction so as not to press the spine anteriorly.

You want to gently challenge the tissue in a firm, controlled manner and wait for release. Check in with the client: Is the pressure okay?

To enhance the effect on the Golgi receptors, ask your client to raise his or her top knee towards the chest. If the client 'hip-hikes' or shortens in the waist, coach them to stay long through the mid back and lumbars as the knee 'floats' towards the chest. Clients will tend to initiate movement too quickly so remember to cue slower, more controlled movements to facilitate the Golgi response and inhibit muscle tone.

▲ **Image 4:** Using an elbow to stimulate quadratus lumborum attachments provides firm, controlled weight and may be easier on your body.
Image courtesy ActionPotential, Inc.

Variations on this technique include using your elbow (Image 4) and positioning the client's upper leg to reduce or enhance lumbar curve. If the client has a significant lordosis, keep both legs bent to help lengthen and decompress the curve. In the case of flat lumbars, try straightening the client's upper leg, which you can then position posteriorly to increase lumbar curve.

Conclusion

The world of fascia research is introducing new considerations for massage therapists and bodyworkers. In addition to verifying and informing our work with adhesions, it is bringing much more clarity to ways we can use mechanoreceptors to create profound structural changes.

Rather than replacing intuition, scientific inquiry challenges our assumptions, often prompting our own informal experimentation and uncovering unexpected connections which expand our awareness. Scientific knowledge and intuition can be mutually reinforcing.

In the second part of this article, we will continue our discussion of ways to address mechanoreceptors via bodywork, hopefully stimulating your mind as well as mechanoreceptors in the process!

Bethany Ward and Larry Koliha split their time between teaching and private practice. Faculty members of Advanced-Trainings.com, which offers continuing education seminars internationally, Ward and Koliha also teach at the Rolf Institute® of Structural Integration. Ward is President of the Ida P. Rolf Research Foundation, a non-profit that supports Structural Integration research and stewards the International Fascia Research Congress.

AMT is proud to be sponsoring Bethany and Larry's visit to Australia in October. After presenting at the 2011 Annual Conference, they will be teaching Advanced Myofascial Techniques workshops in the Gold Coast, Melbourne and Sydney. AMT members will receive a 20% discount on the registration fees. To learn about classes and dates, go to www.advanced-trainings.com

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- *International Fascia Research Congress DVDs & Proceedings Books (2007 & 2009)*
  www.fasciacongress.org
  View the complete recordings of speaker presentations on DVD and access related full-text articles and abstracts written by the world's leading fascia scientists.
- *The Nature of Fascia*
  www.terrarosa.com.au
  Dr. Robert Schleip discusses mechanoreceptors and fascia in depth.
- *Strolling Under the Skin*
  www.guimberteau-jc-md.com/en
  View some of the most fascinating images of living fascia ever recorded.

Websites

- Access fascia research articles at Dr. Schleip's website:
  www.fasciaresearch.com
- Learn more about the International Fascia Research Congress:
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