Astym treatment is perhaps the only therapy approach that was produced through rigorous scientific development: **from theory through basic science investigation to clinical study and practice.** Theories regarding mechanisms of action for Astym treatment were developed based on the foundation of recent histologic research identifying the primarily degenerative nature of tendinopathies, and the investigations into the use of cellular mediators, growth factors and related products to assist in the healing and regeneration of tissues. A group of academic and clinical researchers formed a groundbreaking research project to explore new ideas and paradigm-shifting treatment methods for soft tissue disorders (this became known as the Astym Research Project). The research team consisted of well-known and well-respected physicians, scientists, therapists, healthcare professionals, and included support from major universities and hospitals. This eclectic combination of researchers had the unique advantage of being able to combine knowledge of physiology, cellular biology, emerging scientific discoveries and a large experiential base of treating those with musculoskeletal and athletic injuries. As a result, the *Astym Research Project developed entirely unique new theories on how to engage soft tissue healing, and changed the actual paradigm on how to treat soft tissue dysfunction.*

Guided by the principles and proposed theories for tissue regeneration and scar tissue resorption, the Astym process research team conducted their own basic science and clinical research to develop and refine non-invasive protocols aimed at activating a regenerative process. Once the Astym protocols and process were optimized, clinical studies and trials confirmed Astym treatment’s effectiveness.

In addition to the published, peer-reviewed scientific and clinical research on Astym treatment, **perhaps one of the largest case series ever conducted** is contained in the independent database known as the Astym Analyst, which contains data on almost 10,000 Astym patients. Clinicians from all across the country independently enter data into a national bank of outcomes on Astym treatment, which shows the actual response rates for each diagnosis, patient type, comorbidities, etc. Not only does this provide a **real-world evidence base** for Astym treatment, it also gives patients, health care providers and payers valuable benchmark data, so they know how many treatments it should take to resolve a certain condition. Sample outcomes reports are available to the public on the Research Page at www.astym.com, and customized reports may be generated by Astym-certified therapists in the Provider Resource Center section of the Astym website. Reports may be customized by type of patient, diagnosis, and many other factors. This large-scale outcome database is important and valuable in this era of **accountable care**, verifying that clinical research findings translate into real world results. Outcome results from *FOTO* concur with and support the outcomes in the Astym Analyst, and also show **superior effectiveness** when compared with other interventions. A goal of the accountable healthcare movement is to provide evidence that the care provided produced value for the patient—as reported by the patient. **The extensive outcomes on Astym treatment show its effectiveness and safety across a large population.** The Astym Analyst data show:
Astym therapy is highly effective and safe across a large population. Substantiates the reliability of Astym therapy in the real world, and confirms the results of the controlled studies. The efficacy of Astym therapy demonstrated in research translates into clinical success across a large population. This kind of data is becoming very valuable in the era of accountable care and the Affordable Care Act. Demonstrates the predictability of Astym therapy: expected resolution rates and time frames.

Astym® therapy: scientific and clinical research

Background:

Research on Astym therapy began with a multi-disciplinary research team theorizing about a potential physical treatment method that could have the ability to regenerate and remodel soft tissues. These theories were built upon emerging evidence regarding the degenerative nature of tendinopathy, and the investigations into how cellular mediators and growth factors may enhance healing. Hypothesizing that an external, non-invasive intervention could impact cellular activity, basic science studies were conducted on Astym treatment to elucidate physiologically relevant mechanisms, and to develop specific treatment protocols aimed at stimulating the regeneration of soft tissues and the resorption of inappropriate scar tissue/fibrosis. Specific protocols were developed defining the use of hand-held instrumentation to topically locate underlying dysfunctional soft tissue and then transfer particular pressures and shear forces to the dysfunctional tissue.

In vivo studies revealed that the Astym protocols improve tendon repair, increased limb function, and normalized movement patterns in animal models. Further, Astym treatment resulted in a significant increase in both fibroblast activation and fibroblast number, as well as the production of fibronectin, which together with interstitial collagens may interact to form a fibrillar component of the extracellular matrix. The increase in fibronectin is notable in that fibronectin is thought to be required for normal collagen organization and deposition by fibroblasts and they have the potential to guide cell and tissue behavior during healing as a function of their unique mechanical and bioactive properties. This preparatory line of research preceded clinical trials and substantiated the cellular impact of Astym treatment.

In addition to the intended regenerative effects and cellular impact, the standardized Astym therapy process contains: (i) the assessment and treatment of the entire kinetic chain to address improper movement patterns; and (ii) functional exercise programs which include stretching and strengthening to properly load the tissues along longitudinal lines in order to promote healthy, functional alignment of new collagen deposition, and also to address the need for mechanical loading to extend and enhance regenerative properties of growth factors as shown in animal models.
Astym® therapy: scientific and clinical research

Evidence of Effectiveness of Astym Therapy:

Astym therapy has been found to reduce pain and increase motion in cases where scar tissue impedes movement.\textsuperscript{6,8,9} Scar tissue may result from overuse, problematic biomechanics, trauma or surgery. For example, the Astym research team recently focused on scar tissue resulting from surgery. After significant investigation, treatment protocols for post-mastectomy patients with restricted movement were developed and their efficacy tested in clinical research. The research focused on the thickened scar tissue and hypersensitive soft tissue adhesions that develop following mastectomy and other treatment for breast cancer. These difficulties are often left untreated, leaving many women to suffer with tight scar tissue, poor flexibility, swelling, decreased range of motion, and pain. Following Astym therapy, the efficacy research verified women experienced less pain, increased function and reduced hypersensitivity.\textsuperscript{6}

Astym treatment has also been used to assess and treat tendinopathy, and has been found to reduce pain and increase motion and functional ability.\textsuperscript{10,11,12} When Astym treatment was compared to deep transverse friction massage (DTFM), exercise and stretching in a prospective, randomized, controlled trial design, Astym treatment showed superior efficacy in the resolution of tendinopathy, and further demonstrated efficacy in the cases of tendinopathy that were recalcitrant to DTFM, exercise and stretching.\textsuperscript{13}

In a large, randomized trial on Astym therapy vs. eccentric exercise in the treatment of lateral elbow tendinopathy, Astym treatment resolved 78.3\% of subjects with tendinopathy of the lateral elbow, and eccentric exercise resolved 40.9\% of subjects. Interestingly, of the recalcitrant subjects who did not resolve with eccentric exercise and then chose to receive Astym treatment, four weeks of Astym application resulted in a resolution of 95.7\% (20/21) of subjects, who showed significant improvements in pain with activity (p<0.005), function (p = 0.002), and DASH scores (p<0.005). Long-term follow-up at 6 and 12 months revealed subjects maintained their gains.\textsuperscript{14}

Research presented at the 2015 CSM Conference*:  

- **The Effect of Astym Treatment on Muscle Performance: A Randomized, Blinded, Clinically Controlled Trial**
- **Astym Treatment Improves Quantity of Forward Bending: A Clinically Controlled Trial**
- **Astym Treatment Improves Behind the Back Functional Reach: A Clinically Controlled Trial, Repeated Measures Design**
- **Astym Treatment Improves Bilateral Hamstring Flexibility and Achilles Tendinosis in A Child with Cerebral Palsy**

*Each of these controlled trials demonstrates the efficacy of Astym treatment on increasing muscle power and/or improving movement.
In addition to the research outlined above, findings of case studies and case series performed on Astym therapy indicate effectiveness and safety of Astym therapy as applied to other conditions. For a full listing of research publications, please visit www.astym.com/Medical/Research.


Is Evidence on Instrument Assisted Soft Tissue Mobilization (IASTM) applicable to Astym therapy or vice versa?

Astym therapy and IASTM are very different in goals and application, and therefore any application of research findings from one to the other would be inappropriate and misleading.

What is the research on IASTM techniques?

IASTM techniques

Background:

IASTM is described as “an instrument assisted form of deep transverse friction massage (DTFM) as proposed by Cyriax”. The goal of IASTM is to mechanically break up scar tissue and fascial restrictions. Tools made of steel or an otherwise rigid material are utilized to induce trauma to the affected soft tissues and initiate an inflammatory response. Applying ice is a standard practice after performing IASTM to help abate excessive inflammation sustained from the treatment. The amount of trauma or the extent of the inflammatory response are not defined in the limited amount of literature on IASTM, however, anecdotal reports and video documentation of IASTM indicate the trauma may be significant. The questions regarding the safety of IASTMs are also reinforced by cautions issued by the major IASTM tool manufacturer about concerns of IASTM’s safety, “causing therapists and medical doctors to 1) not consider IASTM for their outpatient clinics and 2) specifically rule out Graston Technique® treatment for their patients”. The safety concerns and questionable effectiveness have resulted in some physicians and physician groups recommending against IASTM application.

Animal studies have shown that transverse frictions do not promote repair of sprained ligaments, and this apparent inability to heal soft tissue appears to extend to the tooled versions of DTFM (IASTMs). In an animal study where IASTM tools were used to perform cross-fiber massage, it was shown that the potential for initial acceleration of tissue healing did not result in improved overall ligament healing.

Evidence of Effectiveness of IASTM techniques:

There are some anecdotal reports suggesting that the IASTM techniques may be helpful in soft tissue disorders, however, there is inadequate evidence in the literature to support clinical use.

In a pilot study where the same clinician used IASTM tools to deliver treatment to one group and then performed the same treatment on another group with only the clinician’s hands, it was found that using tools did not improve clinical results, suggesting that manual therapy with IASTM tools is no more effective than manual therapy with hands alone.

In a larger study adding IASTM to a dynamic balance training program for chronic ankle instability, it was shown that the addition of IASTM did not improve treatment results of subjects.
In a study of 30 subjects with lateral elbow tendinopathy, IASTM was compared to no treatment (subjects waiting with information provided on stretching, ergonomics and what to expect with the condition), and it was found that IASTM results were comparable to no treatment being provided.

Case reports and a case series have been published where IASTM was applied, however, IASTM is typically combined with other approaches, such as chiropractic manipulation, ART, electrical stimulation, ultrasound, exercise and/or acupuncture, making it difficult or impossible to draw conclusions or determine the effectiveness of any one approach. Further study is needed on IASTM to determine if it has a role in the treatment of soft tissue dysfunction.


Graston Technique® Clinical Information for the GT Professional, The Edge, Spring 2011.


