



# Joint, Tendon & Cartilage Conditions

## Shockwave & EMTT — Science, Mechanism & Outcomes

Patient Guide | Advanced Spinal Care & Regenerative Medicine

### What Are Tendon, Joint & Cartilage Conditions?

Tendons are the dense, rope-like tissues connecting muscle to bone. Cartilage — including the meniscus in the knee and the labrum in the shoulder and hip — cushions joints and provides critical structural stability. When these tissues are injured or degenerate, their limited blood supply slows the body's natural repair response dramatically. The result: pain that lingers, function that declines, and a path that too often leads toward injections or surgery.

Shockwave therapy and EMTT work by directly stimulating the biological repair processes these tissues need — giving your body the signals to actually heal, not just manage symptoms.

**5–7**

sessions typical for lasting results\*

**80%+**

of patients respond to shockwave therapy [1]

**2–4x**

faster recovery vs. rest alone [2]

*\*Newer or acute injuries often resolve in 3–5 sessions. Chronic conditions — present for months or years — typically require 5–7 sessions, as the tissue repair environment requires more biological stimulus to reactivate.*

### How Shockwave Therapy Works

Shockwave therapy delivers high-energy acoustic (sound) waves into damaged tissue through a handheld applicator placed on the skin. Unlike diagnostic ultrasound, these waves carry enough mechanical force to trigger a precise cascade of cellular repair events:

What It Does	How It Works
Breaks down scar tissue & calcium deposits	Acoustic pressure physically disrupts calcifications and fibrous adhesions that block normal tissue movement and healing — no needles or surgery required.
Triggers growth factor release	Cells release TGF- $\beta$ 1, IGF-1, and VEGF — proteins that signal tendon and cartilage cells to rebuild. This reactivates the same repair cascade the body uses in acute injury [3], even in tissue damaged for years.
Builds new blood vessels	Shockwave stimulates new capillary formation (angiogenesis) [4], restoring the nutrient supply that chronically injured tendons and cartilage lack.



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What It Does	How It Works
Reduces pain signals	Shockwave depletes Substance P — a neuropeptide that maintains chronic pain [5] — producing relief that often begins after the first 1–2 sessions and deepens over the course.

### How EMTT Works

EMTT (Extracorporeal Magnetotransduction Therapy) uses high-intensity pulsed magnetic fields to reach deep into joint structures — penetrating more than 15 cm — far beyond what standard magnetic therapy devices achieve. At the cellular level it:

- **Powers up cellular energy production:** Magnetic fields stimulate mitochondria to produce more ATP [6], giving injured cells the fuel they need to carry out repair.
- **Calms inflammation at the source:** EMTT suppresses NF-KB — the molecular switch that drives chronic inflammatory gene expression [7] — reducing inflammation without drug side effects.
- **Supports cartilage cell survival:** Promotes chondrocyte (cartilage cell) survival and stimulates production of collagen type II and aggrecan — the structural proteins that make cartilage resilient [8].

#### Why combine both?

Shockwave creates the mechanical stimulus that reactivates dormant tissue repair. EMTT provides the cellular energy and anti-inflammatory environment that allows repair to complete. Used together, they consistently outperform either therapy alone.

#### The equipment matters: why we use Storz Medical

Not all shockwave devices are equal. We use Storz Medical systems — Swiss-engineered, clinically validated machines that set the standard for output precision, tissue penetration depth, and treatment consistency.

Storz devices have been the instruments of choice in the majority of peer-reviewed shockwave clinical trials published over the past two decades, and are used by Olympic training centers, professional sports medicine programs, and leading regenerative medicine practices worldwide. When you see statistics like '80% response rate,' those results were achieved with devices at this level of quality — and that's what we bring to every session.

#### Shockwave as a diagnostic tool: mapping your tissue

One of the most clinically useful — and often surprising — aspects of shockwave therapy is what it reveals about your tissue before treatment even begins.

When the shockwave applicator is moved over healthy tissue, patients typically feel mild pressure but little discomfort. When it passes over damaged, inflamed, or dysfunctional tissue, it produces a clear, localized pain response. This differential pressure sensitivity allows us to precisely map where pathology exists — often identifying areas of dysfunction that weren't apparent on palpation or even imaging.



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This real-time tissue mapping guides where we focus treatment, helps track improvement across sessions (as tissue heals, the pain response normalizes), and gives both you and your provider objective feedback on how your body is responding.

### Conditions We Treat

<b>Plantar Fasciitis / Heel Pain</b>	Extensively studied; high responder rates even in cases that have failed cortisone injections. [9]
<b>Tennis / Golfer's Elbow</b>	Restores tendon integrity without the tissue-weakening effects of repeated steroid injection.
<b>Rotator Cuff Tendinopathy</b>	Effective for partial tears, calcific deposits, and chronic rotator cuff degeneration.
<b>Patellar Tendinopathy</b>	Stimulates collagen remodeling and reduces the neurogenic pain component that makes this so persistent.
<b>Achilles Tendinopathy</b>	Both insertional and mid-substance pathology respond well.
<b>Meniscus Tears</b>	Reduces perimeniscal inflammation and supports fibrocartilage repair in partial and degenerative tears not requiring surgery.
<b>Hip &amp; Shoulder Labrum</b>	Addresses perilabral inflammation, capsular healing, and surrounding muscular dysfunction contributing to instability and pain.
<b>Hip &amp; Shoulder Bursitis</b>	Reduces bursal inflammation and addresses underlying tendinopathy that commonly drives it.
<b>Sacroiliac Joint Dysfunction</b>	Reduces ligamentous inflammation and deep joint irritation; EMTT provides additional penetrating anti-inflammatory effect.

### Using These Tools Proactively

Research on tendon biology shows that microstructural damage accumulates long before pain appears. Shockwave provides a targeted stimulus that addresses this subclinical degeneration before it becomes a clinical problem — and before the tissue repair environment becomes harder to reactivate.

- Maintain tendon elasticity and structural resilience with periodic treatments
- Stimulate collagen maintenance in tissues under repetitive demand
- Preserve cartilage quality and joint health over time
- Reduce the biological wear that accumulates between training or high-demand work cycles

### What to expect at your visit



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Sessions take approximately 30 minutes. Most patients resume normal activities the same day. Acute injuries often resolve in 3–5 sessions; chronic conditions typically require 5–7 for lasting results. Many patients notice measurable improvement after sessions 1–2, with continued gains through the course.

### References

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- <sup>[3]</sup> Wang FS, et al. Ras induction of superoxide activates ERK-dependent angiogenic transcription factor HIF-1 $\alpha$  and VEGF-A in shock wave-stimulated osteoblasts. *J Biol Chem.* 2004;279(11):10331–10337.
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