



Sports Medicine Update:

NON-SURGICAL TREATMENT OPTIONS
FOR COMMON MUSCULOSKELETAL INJURIES

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Disclosures



I use non-surgical treatments for common musculoskeletal injuries.

I have no relevant financial relationship(s) with ineligible companies to disclose.

Learning Objectives

- ▶ Review the anatomy, pathophysiology, and mechanisms of common musculoskeletal injuries.
- ▶ Learn best practices for appropriately treating and managing common non-surgical musculoskeletal injuries using evidence-based data.
- ▶ Identify appropriate specialty resources for common musculoskeletal injuries.

Common MSK Injuries

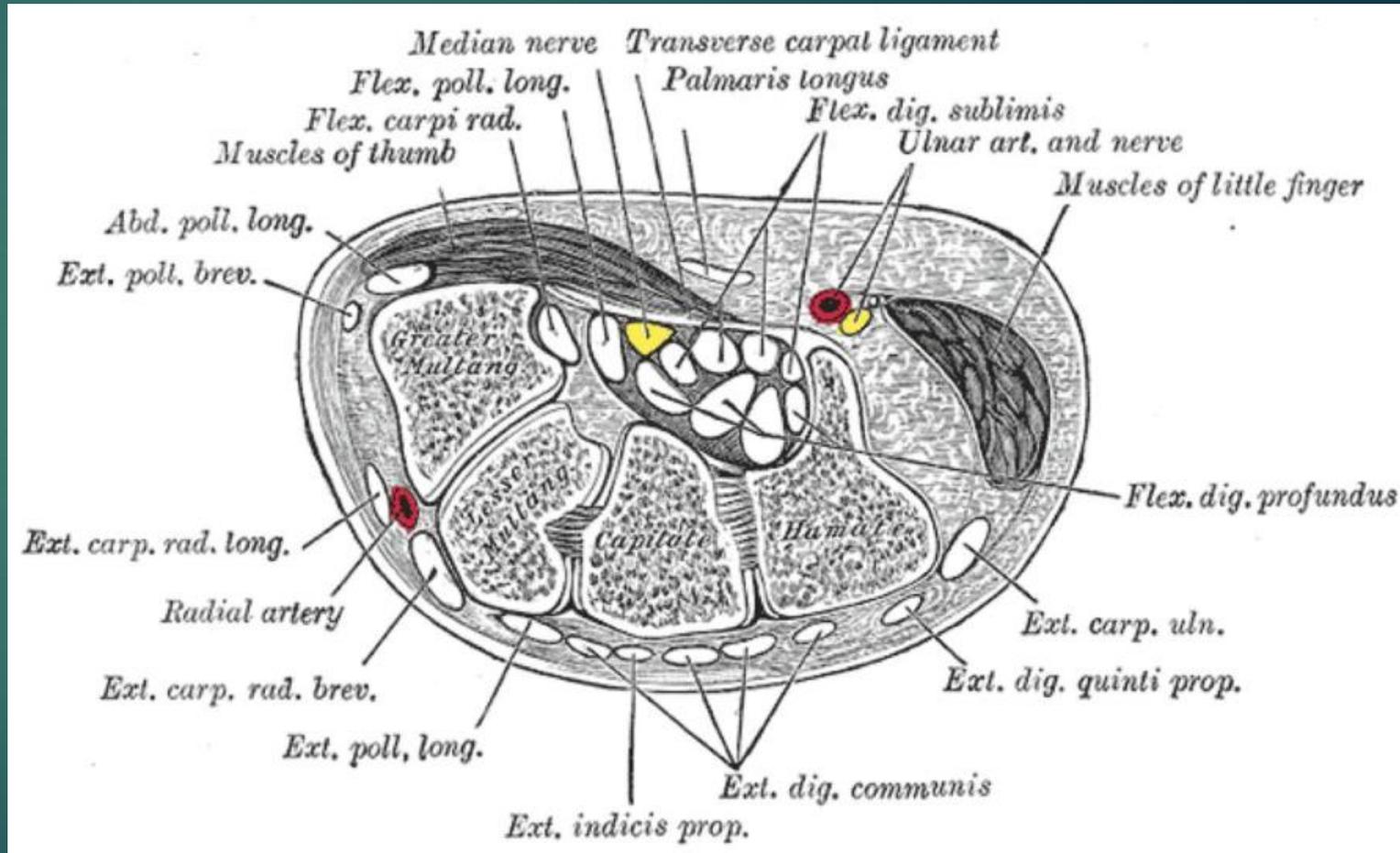
- ▶ **Carpal Tunnel Syndrome**
- ▶ **Chronic Tendinopathies**
 - Lateral epicondylitis
 - Achilles tendinopathy
 - Patellar tendinopathy
- ▶ **Chronic Plantar Fasciitis**
- ▶ **Shoulder Impingement**

Carpal Tunnel Syndrome: A&P

The carpal tunnel contains

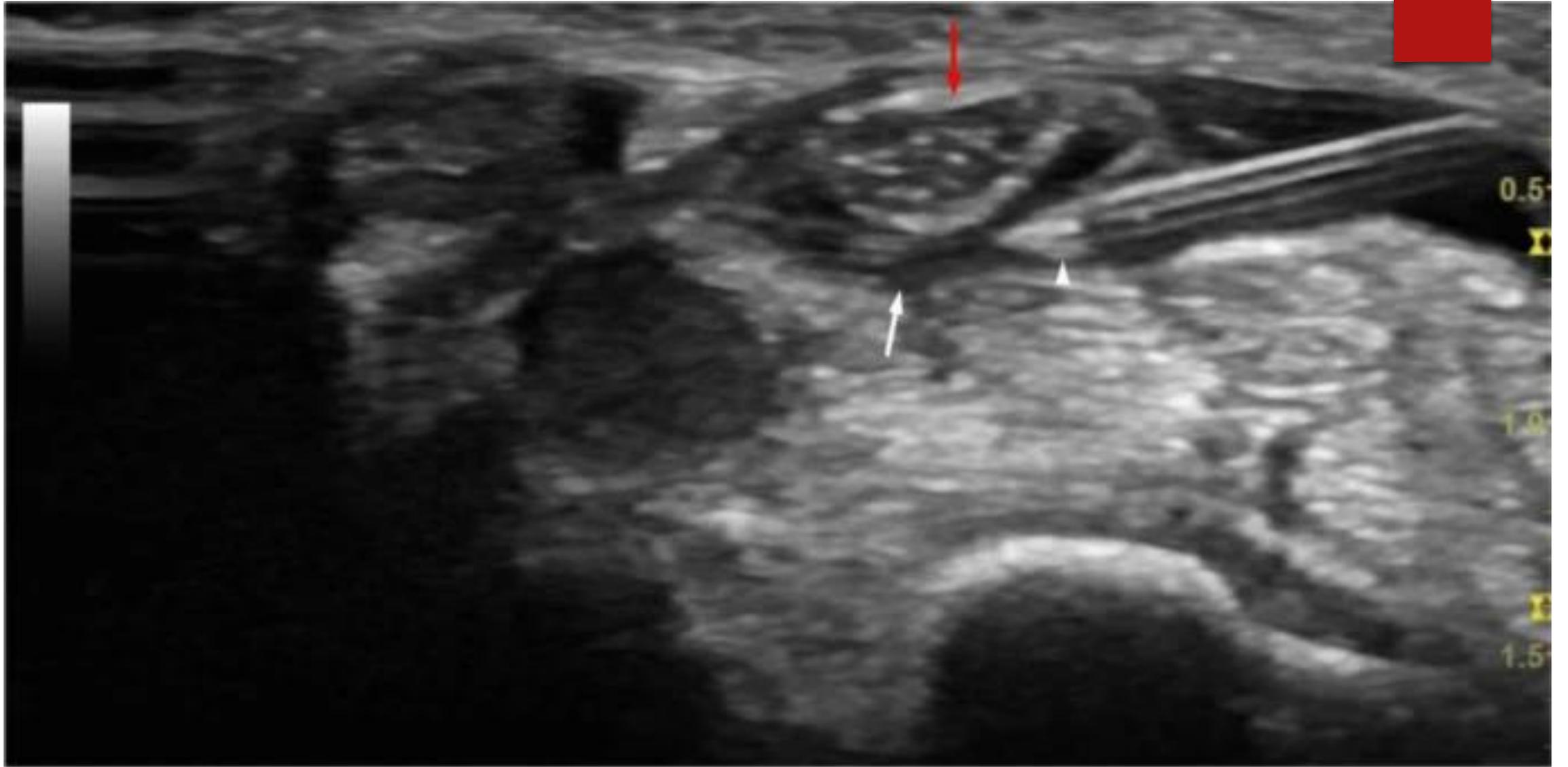
- 4 flexor digitorum superficialis tendons
- 4 flexor digitorum profundus tendons
- Flexor pollicis longus tendon
- Median nerve

MCC: MN compression

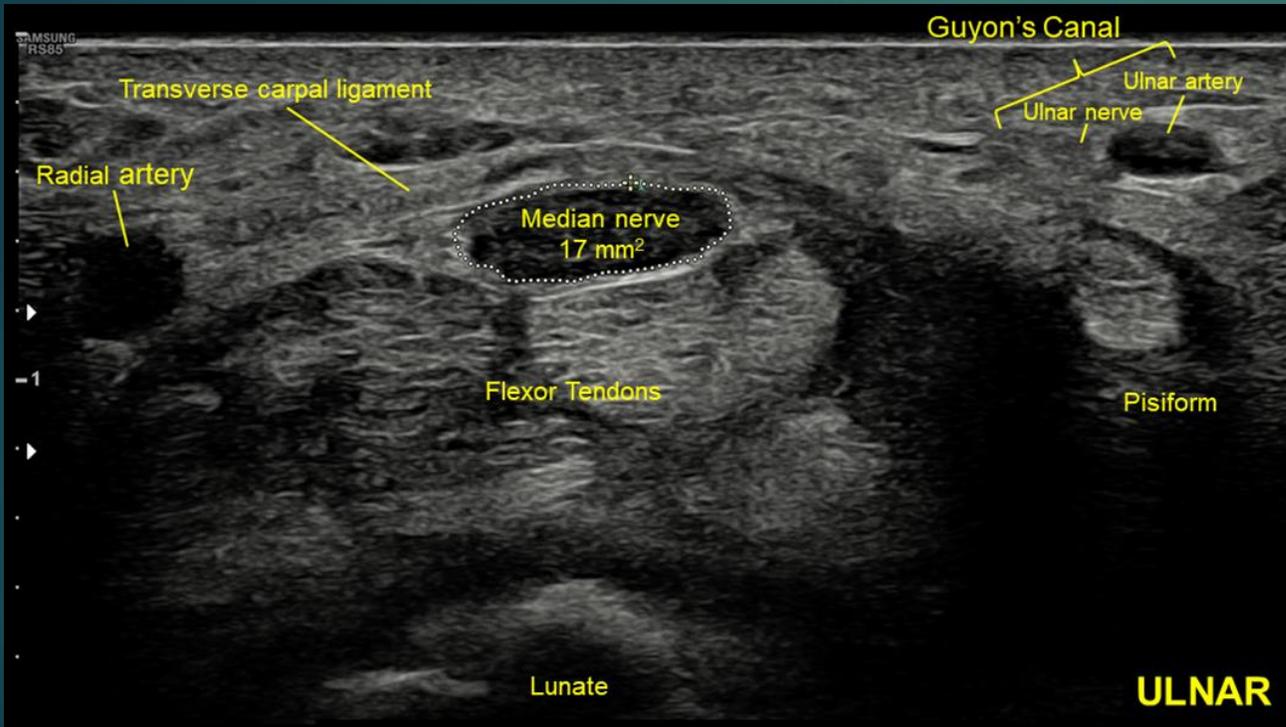


Non-surgical Treatment for Carpal Tunnel Syndrome

- ▶ Night splints
- ▶ Activity Modification
- ▶ Physical Therapy
- ▶ Ultrasound-guided injection/hydrodissection
- ▶ Carpal Tunnel Release **with USG**
 - ▶ First documented in 1997
 - ▶ Requires only 1 small incision, no sutures, close with steristrips



Carpal Tunnel Release with USG



<https://www.sonexhealth.com/physicians/carpal-tunnel-release-with-ultrasound-guidance/>

Carpal Tunnel Release **with USG**

Evidence & Outcomes

- Return to work in as little as 3-5 days.
- No post-procedure opioids needed.
- No post-procedure PT needed.
- Success rate over 95%

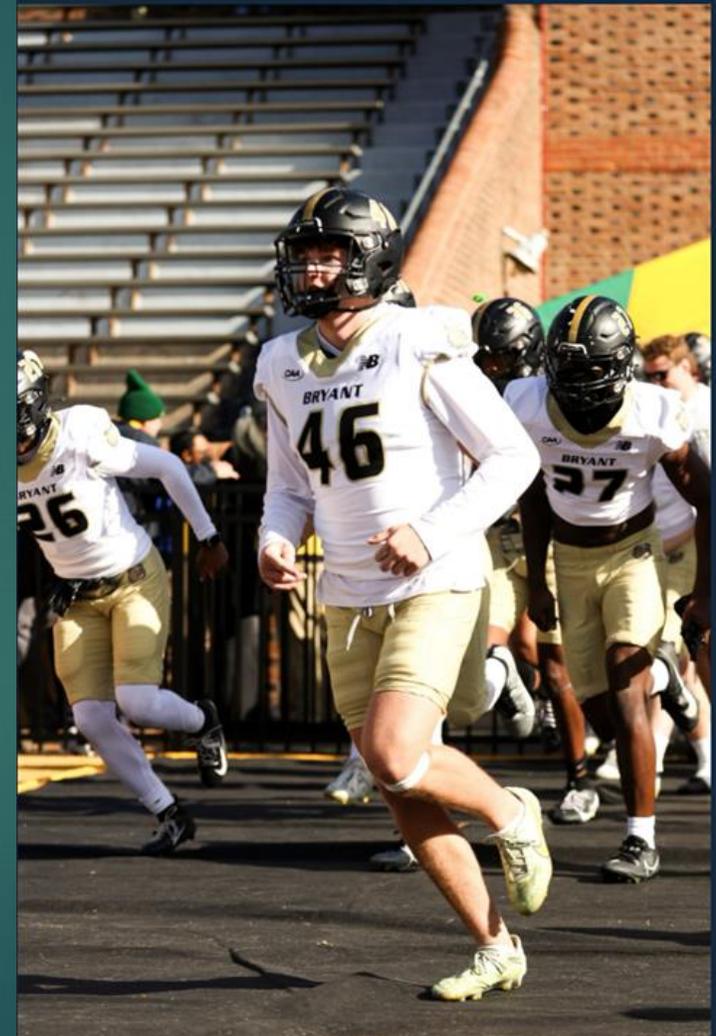
“CTR-US has an established track record of safety and effectiveness in the peer-reviewed literature (over 30 studies, 3000 hands and 2500 patients), including a Level 1 study documenting superior earlier outcomes compared to traditional mini-OCTR without US guidance.” August 2025

Chronic Tendinopathies

- ▶ Lateral epicondylitis (tennis elbow)
- ▶ Achilles tendinopathy
- ▶ Patellar tendinopathy

Causes of chronic tendinopathy

- ▶ Repetitive motion/overuse
- ▶ Improper Mechanics
- ▶ Nutrition
- ▶ Chronic inflammation



Chronic Tendinopathies: A&P

Physiology of Tendinopathy

TENDINITIS

- Acute overuse
- 0-6 weeks
- **Inflammatory** cells present
- Acute changes

TENDINOSIS

- Chronic overuse
- More than 6 weeks
- **No inflammatory** cells present
- Degenerative changes



Non-surgical Treatments for Chronic Tendinopathies

- ▶ Physical Therapy focused on **eccentric** exercises, mechanics
- ▶ Chiropractic Therapy focused on **mechanics**
- ▶ Ultrasound-guided tenotomy
- ▶ Platelet-Rich Plasma (PRP)
- ▶ Extracorporeal Shockwave Therapy (ESWT)

Recommend AVOIDING: steroids, NSAIDs, immobilization, surgery*

Chronic Plantar Fasciitis: A&P



- ▶ MCC of chronic heel pain in adults
- ▶ Causes: Repetitive stress, tight plantar flexor muscles & posterior chain, obesity, possibly over-pronation
- ▶ Type 1 collagen fibers, not elastic, well-innervated, poorly vascularized
- ▶ 4+ mm on U/S = chronic thickening
- ▶ Treatment options are similar to those for chronic tendinopathies (ie PT, chiro, tenotomy, PRP, ESWT)

Ultrasound-Guided Tenotomy

***Promotes blood flow**

Indications include

- Lateral epicondylitis
- Achilles tendinosis
- Patellar tendinopathy
- Other tendinopathies (ie calcific tendinopathy)
- Chronic plantar fasciitis



<https://tricemedical.com/animation-tx-microtip-soft-and-hard-mkt-397reva/>

Evidence for USG tenotomy

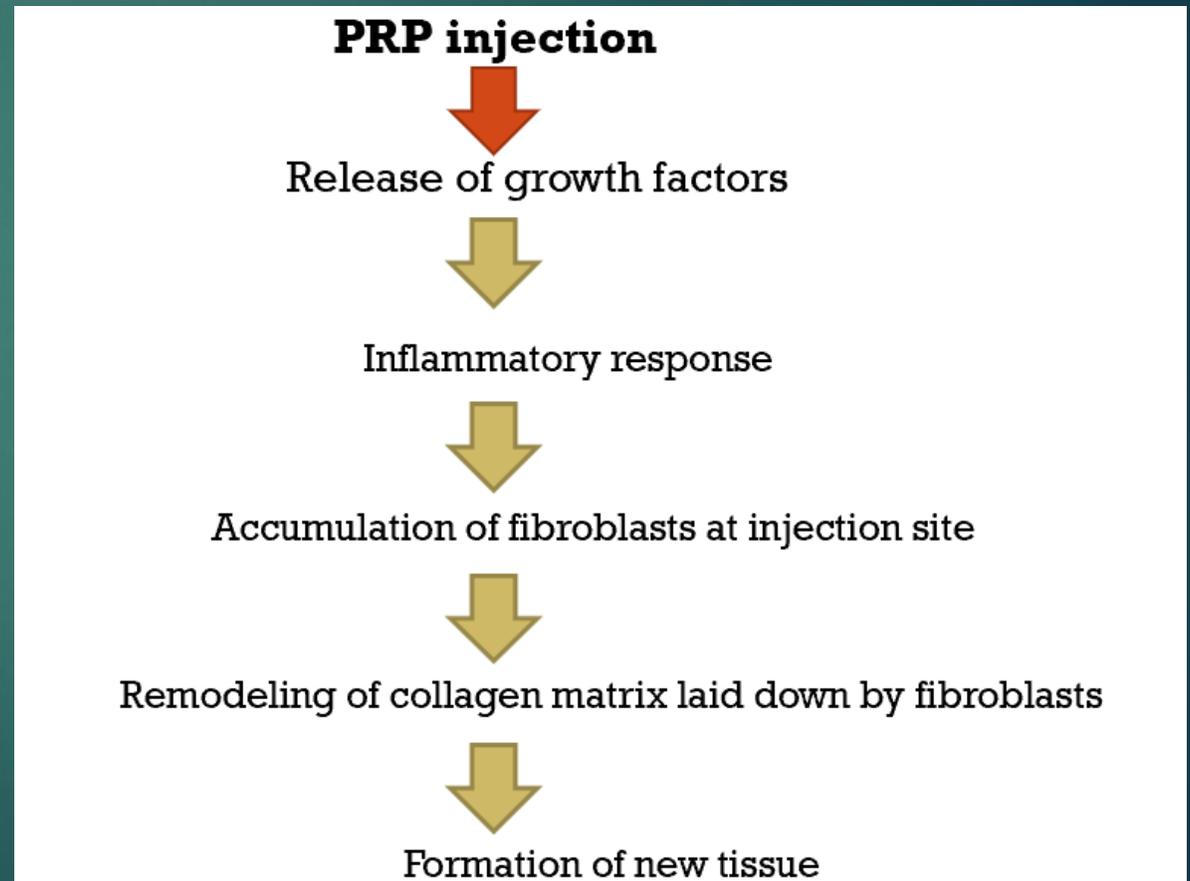
- Lateral epicondylitis
- Achilles tendinopathy
- Patellar tendinopathy
- Chronic plantar fasciitis

TABLE 1. Effects of growth factors found in platelet-rich plasma²

Growth factor	Effect
EGF	<ul style="list-style-type: none">• Chemoattractant for endothelial cells, fibroblasts, and keratinocytes• Fibroblast migration and proliferation; collagen synthesis
IGF	<ul style="list-style-type: none">• Bone maintenance• Cell apoptosis modulation
PDGF	<ul style="list-style-type: none">• Chemotactic effect on fibroblasts, mesenchymal stem cells, monocytes, neutrophils, osteoblasts• Fibroblast migration and proliferation; collagen synthesis• Potent mitogen for fibroblasts and smooth muscle cells• Involved in all three phases of wound healing: angiogenesis, formation of fibrous tissue, and reepithelialization
TGF- β	<ul style="list-style-type: none">• Mitogen for fibroblasts, osteoblasts, smooth muscle cells• Promotes angiogenesis and extracellular matrix production
VEGF	<ul style="list-style-type: none">• Powerful angiogenic growth factor• Important in wound healing, improved vascularity, and endochondral ossification

Key: EGF, epithelial growth factor; IGF, insulinlike growth factor; PDGF, platelet-derived growth factor; TGF- β , transforming growth factor-beta; VEGF, vascular endothelial growth factor.

Platelet-Rich Plasma



Evidence for PRP

- Lateral epicondylitis
- Achilles tendinopathy
- Patellar tendinopathy
- Chronic plantar fasciitis

Extracorporeal Shockwave Therapy (ESWT)



Extracorporeal Shockwave Therapy (ESWT)

- ▶ **Promotes blood flow, reduces inflammation**
- ▶ Different types of shockwave therapy
 - ▶ Radial: superficial, broad, high-energy pressure waves*
 - ▶ Focused: targeted, deep
 - ▶ Electrohydraulic: broad or focused, low-intensity
 - ▶ High-intensity vs Low-intensity shock waves



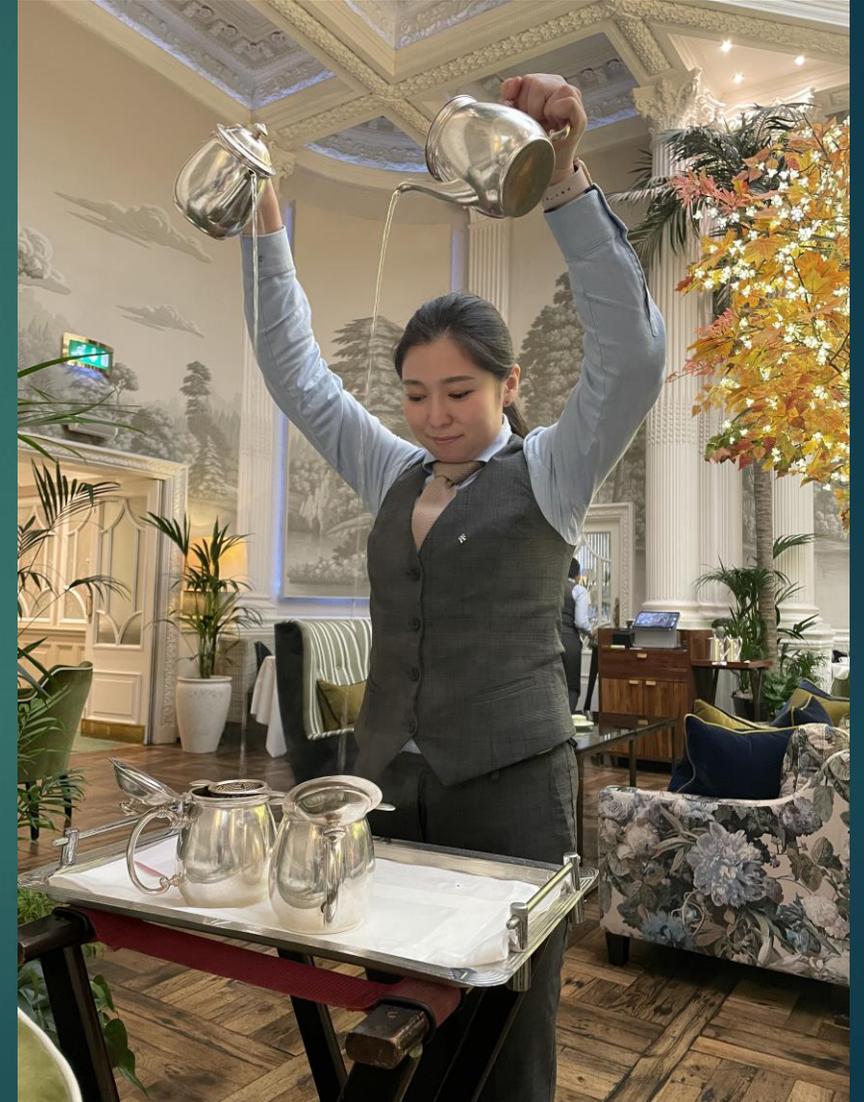
Evidence for ESWT

- Lateral epicondylitis
- Achilles tendinopathy
- Patellar tendinopathy
- Chronic plantar fasciitis

Shoulder Impingement: A&P

Causes include

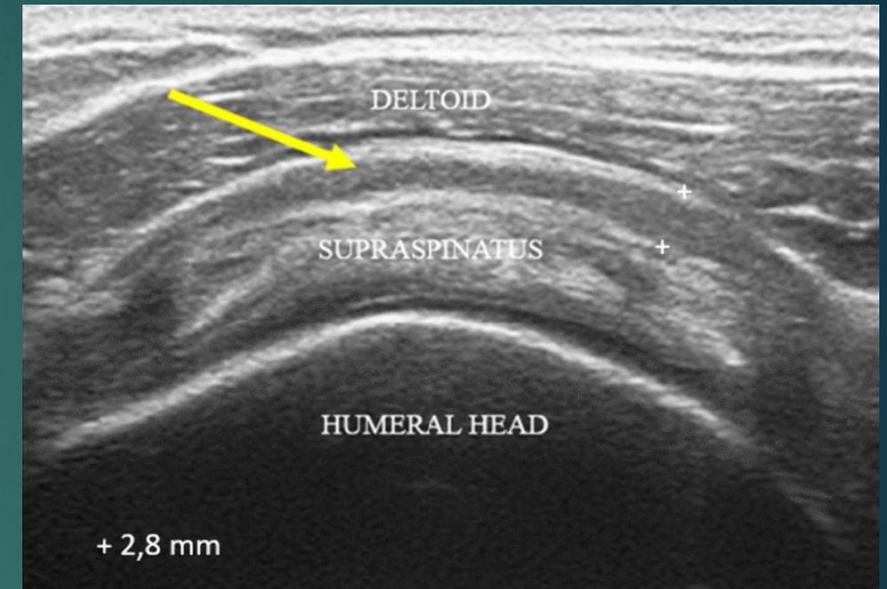
- ▶ Repetitive overuse
- ▶ Mechanics (ie posture)
- ▶ Downsloping acromion or spurring
- ▶ Subacromial/subdeltoid bursitis
- ▶ RTC tendinopathy and/or tear
- ▶ Calcific tendinopathy or calcific bursitis



Shoulder Impingement

- ▶ Non-surgical treatment options
 - Physical Therapy
 - Chiropractic Therapy
 - Activity Modification
 - Platelet-Rich Plasma (PRP)
 - Extracorporeal Shockwave Therapy (ESWT)

- ▶ What about a steroid injection?



Evidence for treatments of Shoulder Impingement: PRP

- ▶ Rossi LA, Brandariz R, Gorodischer T, Camino P, Piuzzi N, Tanoira I, Ranalletta M. **Subacromial injection of platelet-rich plasma provides greater improvement in pain and functional outcomes compared to corticosteroids at 1-year follow-up:** a double-blinded randomized controlled trial. J Shoulder Elbow Surg. 2024 Dec;33(12):2563-2571.
- ▶ Hewavithana PB, Wettasinghe MC, Hettiarachchi G, Ratnayaka M, Suraweera H, Wickramasinghe ND, Kumarasiri PVR. **Effectiveness of single intra-bursal injection of platelet-rich plasma against corticosteroid under ultrasonography guidance for shoulder impingement syndrome:** a randomized clinical trial. Skeletal Radiol. 2024 Jan;53(1):51-58.
- ▶ Other

Evidence for treatments of Shoulder Impingement: ESWT

- ▶ Rhim HC, Singh M, et al. **Recommendations for use of extracorporeal shockwave therapy in sports medicine: an international modified Delphi study.** Br J Sports Med. 2025 Sep 2;59(18):1287-1301.
- ▶ Circi E, Okur SC, Aksu O, Mumcuoglu E, Tuzuner T, Caglar N. **The effectiveness of extracorporeal shockwave treatment in subacromial impingement syndrome and its relation with acromion morphology.** Acta Orthop Traumatol Turc. 2018 Jan;52(1):17-21.
- ▶ Louwerens JK, Veltman ES, van Noort A, van den Bekerom MP. **The Effectiveness of High-Energy Extracorporeal Shockwave Therapy Versus Ultrasound-Guided Needling Versus Arthroscopic Surgery in the Management of Chronic Calcific Rotator Cuff Tendinopathy: A Systematic Review.** Arthroscopy. 2016 Jan;32(1):165-75.
- ▶ Other

Specialty resources for non-surgical treatment of MSK injuries

- ▶ Sports Medicine Physician
- ▶ Physical Therapist
- ▶ Chiropractor
- ▶ Nutritionist
- ▶ Naturopath
- ▶ Acupuncturist
- ▶ Massage Therapist
- ▶ Functional Medicine Physician
- ▶ Rheumatologist
- ▶ Interventional Radiologist
- ▶ PM&R Physician
- ▶ Athletic Trainer

Top 5 take home points...

1. The A&P of common MSK injuries has not changed over the years however, as we have learned more about them, **more conservative treatment options are available & recommended** for many patients.
2. **Carpal tunnel release with ultrasound guidance is a very safe and effective alternative to surgery** with faster recovery & return to activity.
3. **Avoid steroid injections for chronic MSK injuries**, particularly tendinopathies and chronic plantar fasciitis.
Why? risks>benefits, injuries are degenerative not inflammatory
4. **Shoulder impingement often responds well to conservative treatments** such as PT and PRP.
5. There are several excellent resources and alternatives to surgery for MSK injuries...remember, **over 90% of MSK injuries do not require surgery**.

Thank You!

Questions?

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