Hand and Wrist Strain/Sprain and Tendinopathies

Diagnosis/Condition:	Sprains and strain of hand and wrist Trigger finger, acquired De Quervain's tenosynovitis Other tenosynovitis of hand and wrist
Discipline:	Integrated
ICD-10 Codes:	S63.509A, S66.919A, M65.30, M65.4
Origination Date:	1996
Review/Revised Date:	10/2024
Next Review Date:	10/2026

Painful disorders of the wrist and hand encompass a wide variety of clinical conditions, including acute and chronic injuries (strains, sprains, overuse, dislocation, and fracture), arthritis (degenerative joint disease, rheumatoid), tendinopathy (ganglion cyst, tendinitis, tenosynovitis), and peripheral neuropathy (carpal tunnel syndrome, ulnar neuropathy- "handlebar palsy"). This clinical pathway focuses on commonly encountered causes of wrist and hand pain; sprain/strain injuries and tendinopathies.

Acute sprains of the wrist most commonly occur as a result of a fall but can also occur as result of sports injury, especially contact sports. Chronic overuse injury is common in sports that involve repetitive motions, e.g., throwing and racket sports.

Problems associated with tendons are termed tendinopathies and include tendinitis, tendinosis, and tenosynovitis. The cause of these conditions is often unknown, but usually strain, overuse, or injury may be implicated. There is limited epidemiological evidence for an association between aspects of computer work and tendonitis.[1] Smart phone use is also associated with wrist and hand pain due to overuse strain.[2]

Tendinitis can affect any tendon but is most seen in the wrist and fingers. Tenosynovitis is inflammation of the lining of the tendon sheaths which enclose the tendons. The tendon sheath is usually the site which becomes inflamed, but both the sheath and the tendon can become inflamed simultaneously. De Quervain's tenosynovitis is the most common form of this disorder and involves the tendon sheaths of the extensor pollicis brevis and abductor pollicis longus. Risk factors include repetitive or forceful manual work, female gender, pregnancy, post-partum childcare, and test messaging.[3,4]

Stenosing tenosynovitis that involves the tendon sheath of the fingers can cause "trigger finger." Trigger finger is more frequent in women >53 years old. It may be related to diabetes, body mass index (obesity), and certain occupations.[5]

Subjective Findings and History

- Acute trauma, especially for strains and sprains.
- Repetitive movements such as grasping, pinching, knitting, hand work, tool use, and smart phone use.
- Often idiopathic, especially tenosynovitis.
- Personal medical history may be important including pregnancy, systemic illnesses such as diabetes, rheumatic conditions (e.g., rheumatoid arthritis), concurrent medications.
- Pain, swelling, numbness, restricted motion, "triggering" of digits.
- Palpable nodule at affected tendon or tendon sheath.
- A De Quervain's screening tool (DQST) has been developed for both research and clinical use.[6]

Objective Findings

- Palpation:
    - Edema, ecchymosis, tenderness, crepitus, nodule, triggering.
- ROM: frequently decreased.
- Orthopedic tests— provocative maneuvers of involved structures often painful or limited, e.g. Finkelstein's.
- Neurologic examination to differentiate neurogenic problems: Tinel's, Phalen's Sign, sensory testing, muscle strength, passive elbow flexion/pronator test.
- Positive apprehension test.
- Diagnostic imaging when appropriate, e.g. radiographs to rule out navicular/scaphoid fracture with trauma.

Assessment

The clinical impression should indicate the specific anatomical structures involved and clinically correlate them with the mechanism of injury, history, subjective complaints, and objective findings.

Plan

Conservative interventions are the first-line treatments for tendinopathies and is recommended for mild conditions. There are limited high quality evidence-based studies to assist in choosing the conservative treatment for tenosynovitis, tendonitis, or De Quervain's disease. The addition of active care can reinforce care received in the office.
Referral for surgical consultation may be appropriate in traumatic cases.

Diet:

- Adequate protein consumption.

Herbal Medicine (Western):

- Botanical supplementation.
    - Topical treatments (e.g., Comfrey (Symphytum) poultice, hypericum, arnica, calendula).
- Anti-inflammatory botanicals have shown benefit in other spinal and joint problems and may be used as supportive therapy.[7]
- Herbs such as willow bark tea (Salix alba) topical wintergreen (Gaultheria spp) have anodyne effects.
- Nervine herbs such as hops (humulus spp), Valerian, Kava Kava, and lavender can all be useful in reducing pain and promoting sleep in painful conditions.

Homeopathy:

- Homeopathy per rubric.

Supplements and Nutrients:

- Nutritional supplementation (Vitamin B complex, Vitamin C, manganese, magnesium, calcium, glucosamine sulfate, chondroitin).[8]

Pharmaceuticals (OTC):

- NSAIDs
    - Topical salicylic acid, other topical analgesic cream.

Immobilization, Bracing, Taping:

- Brace, taping, and splinting.[9]
- Kinesiotaping or thumb spica cast may offer short term benefit for de Quervain's.[10]

Physical Modalities (Western):

- Physical therapy modalities: ultrasound, low level laser, phonophoresis, extracorporeal shock wave therapy (ESWT) were the most effective.[11]
- Mirror neurons-based rehabilitation techniques.[12]
- Rest from inciting activities and training in proper mechanics of joint protection.

Movement and Exercise:

- Passive exercises to improve range of motion.
- Feedback-guided therapy performed on a tablet touchscreen was more effective than paper based therapy.[13]
- Exercises for stretching, mobility, strength, and improved neuromuscular coordination and conditioning. Activities/work restrictions if appropriate may include: no repetitive motion, lifting, grasping, pinching; keyboard and other job site modifications.

Soft Tissue Therapies:

- Massage therapy such as deep tissue work, cross friction therapy, instrument assisted.
- Soft tissue manipulation (IASTM) and stretching of involved tendons to reduce adhesions.
- Occupational therapy resulted in an improvement of function.[14]

Manual Adjustments/Manipulation:

- Manipulation and mobilization of articular and soft tissue structures.

Acupuncture (excluding pharmocoacupture):

- Acupuncture and Traditional Chinese Medicine.[15,16,17,18]

Injection Therapies:

- Steroid injection is an effective form of conservative management for de Quervain's disease although more research is needed to establish the full benefits of the treatment.[19]
- Neural Therapy seems to be effective in reducing pain and improving hand functions in patients with De Quervain tenosynovitis.[20]

Other treatment options:

- Referral for surgical interventions.[21]

Length of Treatment

- Estimated duration of care: 2-6 weeks.
- If suspicious of carpal fracture despite initial negative radiographs, follow up radiographs may be indicated 10-14 days later if still painful.

Referral Criteria

- Referral to a hand specialist or orthopedist for more severe or persistent symptoms may be appropriate after four weeks without symptomatic or functional improvement.
- Further diagnostic work-up may include referral for advanced imaging.

Resources for Clinicians

Kale S. Trigger finger. eMedicine.com http://www.emedicine.com/orthoped/TOPIC570.HTM)

UpToDate: Evaluation of the adult with acute, subacute or chronic wrist pain; history and examination of the adult with hand pain; Overview of overuse (chronic) tendinopathy.

Resources for Patients

de Quervain's tenosynovitis. MayoClinic.com.
https://www.mayoclinic.org/diseases-conditions/de-quervains-tenosynovitis/symptoms-causes/syc-20371332

Trigger finger. WebMD. http://www.webmd.com/osteoarthritis/guide/trigger-finger

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[1] Waersted, M, Hanvold TN, Veiersted, KB. Computer work and musculoskeletal disorders of the neck and upper extremity: a systematic review. *BMC Musculoskeletal Disorders*. 2010 Apr11(79): 79.

[2] Baabdullah A, Bokhary D, Kabli Y, Saggaf O, Daiwali M, Hamdi A. The association between smartphone addiction and thumb/wrist pain: A cross-sectional study. Medicine (Baltimore). 2020 Mar;99(10):e19124.

[3] Rowland P, Phelan N, Gardiner S, Linton KN, Galvin R. The Effectiveness of Corticosteroid Injection for De Quervain's Stenosing Tenosynovitis (DQST): A Systematic Review and Meta-Analysis. Open Orthop J. 2015;9:437-444. Published 2015 Sep 30.7

[4] Ashurst JV, Turco DA, Lieb, BE. Tenosynovitis caused by texting: an emerging disease. *The Journal Of The American Osteopathic Association* 2010 May;110(5);294 – 6.

[5] De la Parra-Márquez ML, Tamez-Cavazos R, et al. *Cir Cir.* 2008 Jul-Aug;76(4):323-7. [Risk factors associated with trigger finger. Case-control study][Article in Spanish]

[6] Batteson R, Hammond A, Burke F, Sinha S. The de Quervain's screening tool: validity and reliability of a measure to support clinical diagnosis and management. *Musculoskeletal Care*. 2008 Sep;6(3):168-80.

[7] Nafiseh Shokri-Mashhadi[1], Mohammad Bagherniya[2], Gholamreza Askari[2], Thozhukat Sathyapalan[3], Amirhossein SahebkarAdv Exp Med Biol A Systematic Review of the Clinical Use of Curcumin for the Treatment of Osteoarthritis. Adv Exp Med Biol. 2021;1291:265-282. doi: 10.1007/978-3-030-56153-6_16.

[8] Da silva AG, Machado ER, De almeida LM, et al. A Clinical Trial with Brazilian Arnica (Solidago chilensis Meyen) Glycolic Extract in the Treatment of Tendonitis of Flexor and Extensor Tendons of Wrist and Hand. *Phytother Res*. 2015;29(6):864-9.

[9] Colbourn J, Heath N, Manary S, Pacifico D. Effectiveness of splinting for the treatment of trigger finger. *J Hand Ther*. 2008 Oct-Dec;21(4):336-43.

[10] J Manipulative Physiol Ther. 2015 Sep;38(7):493-506. doi: 10.1016/j.jmpt.2015.06.006. The effectiveness of passive physical modalities for the management of soft tissue injuries and neuropathies of the wrist and hand: a systematic review by the Ontario Protocol for Traffic Injury Management (OPTIMa) collaboration.
[11] Ferrara PE, Codazza S, Cerulli S, Maccauro G, Ferriero G, Ronconi G. Physical Modalities for the conservative treatment of wrist and hand's tenosynovitis. Semin Arthritis Rheum. 2020 Dec;50(6):1280-1290. doi: 10.1016/j.semarthrit.2020.08.006. Epub 2020 Aug 29.
[12] Tofani M, Santecchia L, Conte A, Berardi A, Galeoto G, Sogos C, Petrarca M, Panuccio F, Castelli E. Effects of Mirror Neurons-Based Rehabilitation Techniques in Hand Injuries.Int J Environ Res Public Health. 2022 May 2;19(9):5526. doi: 10.3390/ijerph19095526.
[13] Blanquero J, Cortés-Vega MD, Rodríguez-Sánchez-Laulhé P, Corrales-Serra BP, Gómez-Patricio E, Díaz-Matas N, Suero-Pineda A. Feedback-guided exercises performed on a tablet touchscreen improved return to work, function, strength and healthcare usage more than a exercise program prescribed on pater for people with wrist, hand, or finger injuries. J Physiother. 2020 Oct;66(4):236-242. doi: 10.1016/j.jphys.2020.09.012. Epub 2020 Oct 14.
[14] Margo Sheerin M, O'Riordan C, Conneely M, Carey L, Ryan D, Galvin R, Morrissey AM, Effectiveness of occupational therapy interventions on function and occupational performance among adults with conditions of the hand, wrist, and forearm: A systematic review and meta-analysis, Aust Occup Ther J. 2024 Feb;71(1):175-189. doi: 10.1111/1440-1630.12905. Epub 2023 Oct 4.
[15] Hadianfard M, Ashraf A, Fakheri M, Nasiri A. Efficacy of acupuncture versus local methylprednisolone acetate injection in De Quervain's tenosynovitis: a randomized controlled trial. *J Acupunct Meridian Stud*. 2014;7(3):115-21
[16] Da silva JB, Batigália F. Acupuncture in De Quervain's disease: a treatment proposal. *Acupunct Med*. 2014;32(1):70-2.
[17] Lu CY, Chang HH, Sung FC, Chen PC. Characteristics of Traditional Chinese Medicine Use in Pediatric Dislocations, Sprains and Strains. *Int J Environ Res Public Health*. 2017;14(2)
[18] Inoue M, Nakajima M, Hojo T, Itoi M, Kitakoji H. Acupuncture for the treatment of trigger finger in adults: a prospective case series. *Acupunct Med*. 2016;34(5):392-397.
[19] Omer Ashraf M, Devadoss VG, Systematic review and meta-analysis on steroid injection therapy for de Quervain's tenosynovitis in adults. Eur J Orthop Surg Traumatol. 2014 Feb;24(2):149-57. doi: 10.1007/s00590-012-1164-z. Epub 2013 Jan 22.
[20] Şenlikci H B, Odabaşı O S, Ural Nazlıkul F G, Nazlıkul H, Effects of local anaesthetics (neural therapy) on pain and hand functions in patients with De Quervain tenosynovitis: A prospective randomised controlled study. Int J Clin Pract. 2021 Oct;75(10):e14581. doi: 10.1111/ijcp.14581. Epub 2021 Jul 6.
[21] Shekouhi R, Taylor T, Chen Z, Liu A, Hao, K A, Pomputius A, Chim H, Evaluation of Different Surgical Techniques for Revision Cubital Tunnel Release: A Meta-Analysis of Patient-Reported Symptoms. J Hand Surg Am. 2024 Feb;49(2):124-140. doi: 10.1016/j.jhsa.2023.11.012. Epub 2023 Dec 15.