

Hand and Wrist Pain

Summary

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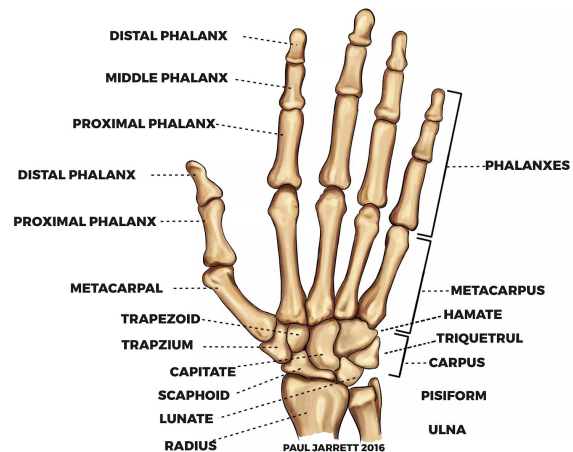
Anatomy

i. Bony Anatomy

The wrist and hand is a very complex body part made up of many joints, muscles, ligaments, and other connective tissues. Since there are so many parts to this body part it puts it more at risk for multiple injuries. The wrist is the joint where the distal end of the radius and ulna connect to the first row of carpal bones; scaphoid, lunate, triquetrum, and pisiform making up the radio-carpal joint. This proximal row of carpal bones connects to the distal row of carpal bones; trapezium, trapezoid, capitate, and hamate making up the midcarpal joint. All of these carpal bones connect together creating many small joints named after the 2 connecting bones. Each of these bones in the distal carpal row connect to one of the metacarpals, the base joint of your fingers, creating the carpometacarpal joints. Each of your 4 fingers (not including the thumb) has an MCP (metacarpal phalangeal joint), PIP (proximal interphalangeal joint), and DIP (distal interphalangeal joint). The thumb however has the CMC (carpometacarpal joint), MCP (metacarpal phalangeal joint), and IP (interphalangeal joint). All of these joints are connected by many ligaments to keep the joints stable but also to allow for mobility at each joint to produce full functional movement of the hand and wrist.

ii. Muscular Anatomy

There are 2 main muscle groups in the wrist and hand. The wrist flexor group and the wrist extensor group both of which originate at the elbow. The flexor group is made up of the wrist flexor digitorum profundus, flexor digitorum superficialis, flexor carpi radialis, flexor carpi ulnaris, palmaris longus, and flexor pollicis longus. All of these muscles have different attachment points at the wrist and fingers, their primary function is to flex the wrist and bend the fingers. These muscle bellies lie on the palmar aspect of your forearm. The extensor group is made up of extensor carpi radialis longus, extensor carpi radialis brevis, extensor digiti minimi, extensor digitorum, and extensor carpi ulnaris. These also have different attachment points at the wrist and fingers with the primary function to extend the wrist and fingers, These muscle bellies lie on the dorsal (back) of your forearm. There are also very small intrinsic muscles which originate and attach within the hand itself, there are some in the thumb region and some in the pinky region. There are also lumbricals, dorsal interossei, and palmar interossei. These function in the task of bringing your fingers together and apart and the motion of opposition.



Common Diagnosis

1. Osteoarthritis

Osteoarthritis can occur in any joint but mainly affects knees, spine, hips, and hands. It is caused by the wearing of the cartilage between 2 joint surfaces leading to joint rubbing causing pain, stiffness, and weakness.. Since there are many bony joints in the hand there are many places where arthritis can occur. The thumb carpometacarpal joint (CMC joint) is one of the most common areas where osteoarthritis can occur. Keeping your joints mobile will help to keep the surfaces lubricated and decrease stiffness. Deep heat can also help to decrease pain and stiffness associated with osteoarthritis. Specific braces and splints can also be made/recommended to help to stabilize the joints during ADL's to improve function and decrease pain. There is no cure for osteoarthritis but an occupational therapist or a hand certified physical therapist can also help with other exercises and adaptations that could help with this condition.

2. Rheumatoid arthritis

Rheumatoid arthritis (RA) is an autoimmune and chronic inflammatory condition in which your immune system attacks your body's tissues and joint lining leading to painful swelling. Since this is an inflammatory condition when swelling is present ice and elevation can be beneficial. During a flare up try to avoid deep heat since that can increase swelling. Physical therapy can help to improve mobility and strength and adapt levels of function as needed. There is not treatment for RA but therapy can help to slow progression and maintain function.

3. Fractures

Fractures can occur in any of the bones of the wrist and hand, including the small carpal bones. Some of the most common fractures include distal radius fracture, scaphoid, and boxer's fracture (fracture of 5th metacarpal). Depending on the type of fracture a cast or brace might be necessary. Once the cast and brace is removed physical therapy can help to regain motion, strength, and function.

4. Strains/Sprains/Tendinitis

A strain is defined as the pulling of a muscle/tendon (connecting muscle to bone) causing damage. A sprain is damage to a ligament (connecting bone to bone). Tendonitis is inflammation of a tendon caused by overuse. The most common area of tendinitis in the hand is the thumb extensor tendon which leads to pain with gripping and thumb flexion activities. Ask your therapist about possible locations of sprains and strains if and injury is suspected so that a specific exercise plan can be developed.

5. Nerve injuries

Carpal tunnel syndrome is the most common nerve injury in the hand and wrist. Symptoms include numbness and tingling and weakness. Stretches can be utilized to decrease tightness causing nerve compression and then to restore strength to the hand.

ADL Management Techniques

With some chronic hand and wrist conditions adaptive equipment might be needed to complete ADL's with less difficulty and improve independence

1. Bottle and jar openers: electric bottle and jar openers are available. With arthritic hands gripping and twisting required for this task can be difficult and painful, especially if grip strength is affected. These tools can help!
2. Utensil assistance: there are utensils designed with larger handles to decrease the amount of grip required to utilize them. There are also adaptive handles that can be put over utensils that you already have! There are also easy grip coffee mugs available that do not require gripping of the handle but allow you to place your entire hand in the cup to assist with gripping.
3. Door knob/faucet grips: Door knob grips allow for a larger surface area to grab and can go over already present door handles. There are also ones that only require your finger to turn the knob instead of requiring a full hand grip
4. Key Turner: Large cover for keys that requires less of a fine pinch grasp
5. Braces and splints can also be beneficial. Ask your doctor or therapist if these could be beneficial for your condition!

