

THE CARPAL TUNNEL

In order to understand CTS, it helps if you understand the anatomy of the carpal (meaning "wrist") tunnel. Conditions in many parts of the body can cause symptoms in the hands and fingers. In CTS, the symptoms occur because a major nerve is compressed as it passes through a narrow tunnel of bone and ligament at the wrist. The result is numbness, tingling, "pins and needles," burning, and pain in the middle and index fingers and thumb, and sometimes in all five fingers.

Normal Carpal Tunnel Anatomy

Carpal Tunnel
In the center of the wrist, bones and a ligament form a narrow tunnel containing tendons and a major nerve.

Carpal Bones
A U-shaped cluster of eight bones at the base of the palm forms the hard, rigid floor and the two sides of the tunnel.

Transverse Carpal Ligament
A very strong, tough, fibrous band, like a rope, lies across the arch of carpal bones, forming the roof of the tunnel.

Median Nerve
This nerve conducts sense from the hand, up the arm, to the central nervous system. When the nerve is compressed at the wrist, the hand and fingers are affected.

Motor Branch
The motor branch of the median nerve controls the muscle surrounding the thumb. Damage affects the hand's ability to grasp large and small items.

Flexor Tendons
The nine tendons have a lubricating lining (synovium), which allows the tendons to slide back and forth through the tunnel as the wrist and the fingers are used.

Causes of Carpal Tunnel Syndrome

Various conditions cause wrist structures to take up extra space in the carpal tunnel. Since bones and ligaments have no "give," this puts pressure on the nerve, resulting in symptoms.

Wear and Tear

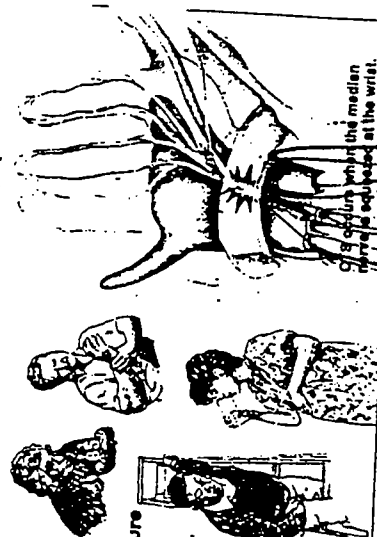
The synovium around the tendons may become thick and sticky due to the normal wear and tear of the aging process or repetitive hand movement, thus pressing the nerve against the tunnel.

Bone Dislocation and Fracture

Previous dislocation or fracture of the wrist causes bone to protrude into the tunnel. Arthritis may also be present. Consequently, the tunnel becomes too narrow and puts pressure on the nerve.

Fluid Retention

Edema (fluid retention) causes swelling of tissue in the carpal tunnel, including pericarpal ligament. This occurs most often during pregnancy, with the symptoms subsiding after delivery.



Swelling around the median nerve is compressed at the wrist.