

## THE WRIST

### At a glance

The wrist is possibly the most important of all joints in everyday and professional life. It is under strain not only in many blue-collar trades, but also in sports and is therefore extremely prone to injury.

The following pages will describe the most typical pathology and injury patterns. Our goal is to familiarize you with the essential anatomical definitions associated with this joint so they can be an aid for a deeper conversation with your physician or as a way to learn the basics about this topic.

<b>Contents</b>	<b>1. Introduction</b>	<b>Page 1</b>
	<b>2. Anatomy and physiology</b>	<b>Page 2</b>
	<b>3. The distal radial fracture</b>	<b>Page 2</b>
	<b>4. The navicular or scaphoid fracture</b>	<b>Page 2</b>
	<b>5. Osteoarthritis or the hand joint</b>	<b>Page 3</b>
	<b>6. The carpal tunnel syndrome (CTS)</b>	<b>Page 3</b>
	<b>7. Tendovaginitis</b>	<b>Page 4</b>
	<b>8. How do FUTURO™ Wrist Supports work?</b>	<b>Page 4</b>

### 1. Introduction

No other parts of the body are called upon to perform as many fine movements as the hand and wrist. They literally “have a hand in” everything, even when performing basic manual labor.

For this reason, our hands and wrists are exposed to major injury hazards, such as falling on the extended arm, for example. Chronic overuse due to one's occupation or sports activities can lead to painful wear and tear over time.

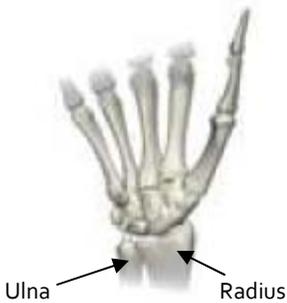
In the hand and wrist area, many tendons, nerves and blood vessels are crowded into very small spaces, so that even minor changes or injuries may noticeably restrict the patient's freedom of movement.

Changes caused by osteoarthritis are the result of damage to the cartilage and malpositions of the individual bones in relation to each other, generally due to fractures. The rather common distal radial fracture tops the list in this category (usually caused by falling on one's extended arm – a typical black ice accident!).

## 2. Anatomy and physiology

The wrist consists of two connections: on one side, it connects the two bones of the lower arm, the radius and the ulna. On the other side, it connects the four fingers and thumb. The articular connection is made possible by eight carpal or wrist bones, which in turn are connected and held to each other by a taut capsular ligament system. All of the contact surfaces of these carpal bones or carpals are coated with a cartilage layer.

The construction of the wrist allows for flexion (bending) and extending (stretching) as well as the side-to-side movement of the hand.



### 1. Cause(s)

The primary cause of this injury is a fall on the lower arm or wrist that transfers force over the carpals (and therefore, particularly over the scaphoid) to the distal end of the radius, where they cause a fracture.

### 2. Clinical aspects/ Symptoms/Diagnosis

**Persisting pain and the wrist being clearly out of position are typical symptoms of a distal radial fracture**

The way the injury unfolds already points to a radial fracture. The injured person feels pain at the radius and in the area where it joins the wrist. Displacing the radial fracture often reveals a wrist that is clearly out of position. X-rays will confirm the diagnosis.

If pain persists in the typical location, but without a radial fracture, then a scaphoid fracture could be the problem. The other carpal bones can also be injured, a diagnosis that is easily missed if one doesn't look carefully enough.

### 3. Therapy essentials

If an isolated, non-displaced radial fracture has occurred, apply a plaster cast to the lower arm for approximately four weeks. If the fracture is displaced, however, then it must be reset. Most of the time, this is done in a closed position – in other words, the fracture is reset under anesthesia and, if need be, fixed in place with wires drilled through the skin and into the radius. Afterwards, a plaster cast is applied to the lower arm. Sometimes a small plate will have to be implanted.

## 4. The navicular or scaphoid fracture

### 1. Cause(s)

Here as well, a fall on the lower arm or wrist is the typical cause of this classic type of fracture. Acting forces are transferred to the scaphoid or navicular bone located in the wrist.

**X-rays of the wrist in various positions can confirm the diagnosis of scaphoid fracture**

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## 2. Clinical aspects/ Symptoms/Diagnosis

The injured person feels pain on the radial side of the wrist, and there may be minor swelling. If routine X-rays rule out a radial fracture (see above), X-rays of the wrist in various positions (navicular series) are recommended. This will confirm the diagnosis or exclude it. If the fracture is overlooked, the bones will not fuse correctly, requiring otherwise avoidable surgery to be performed. MRI or bone scans may also be needed to make the diagnosis.

## 3. Therapy essentials

Fresh scaphoid fractures should be treated conservatively (i.e., apply a plaster cast for about twelve weeks). Afterwards, intensive physical therapy is mandatory to help remobilize the wrist.

## 5. Osteoarthritis of the hand joint

### 1. Cause(s)

Overuse and strain, fractures such as a radial fracture, or dislocation and malpositions of the carpal bones can damage articular cartilage.

## 2. Clinical aspects/ Symptoms/Diagnosis

Wrist pain, often diffuse and non-localized. Sometimes the wrist is swollen. The X-ray often reveals narrowed articular cavities in the affected area.

## 3. Therapy essentials

Conservative treatments are indicated in the early stages. Rest and immobilization are the initial treatments of choice. Anti-rheumatoid agents will also reduce or relieve pain. At this stage, supports that cover the wrist and limit its range of movement somewhat or prevent extreme wrist movements are an essential part of therapy. If these measures no longer provide relief, then various therapy or hand surgical procedures are recommended.

## 6. The carpal tunnel syndrome (CTS)

### 1. Cause(s)

The carpal tunnel is formed by the carpals located on the extensor side of the wrist and the taut, relatively unyielding transverse carpal ligament on the flexor side of the wrist. Various flexing tendons, and the median nerve that provides sensation to the fingers, run through this tunnel.

A narrowing of the carpal tunnel causes pain in the hand and tingling or paresthesia in the fingers. Most of the time the cause is due to genetics. Swelling in the tunnel, due to rheumatoid diseases, hematomas or pregnancy can also damage the nerve.

**Major flexion of the wrist can trigger the typical tingling sensation**

## 2. Clinical aspects/ Symptoms/Diagnosis

Painful paresthesia in the fingers (tingling, creepy-crawly sensation), mostly at night, is typical. Shaking or rubbing the hand provides some relief. The carpal tunnel region on the flexor side of the wrist is tender; major flexion of the wrist can trigger the typical tingling

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sensation. Take X-rays to rule out narrowing caused by changes in the bones. A neurological examination should be carried out to confirm that symptoms are not radiating from the cervical spine. Electrodiagnostic testing (EMG) is the best way to make the diagnosis.

### 3. Therapy essentials

Splints to immobilize the wrist and hand can relieve pain. This option is especially recommended during pregnancy, because symptoms will generally disappear on their own right after delivery.

Otherwise, surgery to divide the transverse ligament is recommended – in most cases, the patient's pain will immediately cease.

### 7. Tenosynovitis

#### 1. Cause(s)

Overuse, blunt-force trauma (such as a blow), or inflammatory rheumatic changes cause the tendon sheaths, which enclose the tendons in many places, to swell. Often, tenosynovitis affects the tendons that stretch (extend) the fingers and the thumb. These tendons are located on the back (dorsal region) of the hand.

#### 2. Clinical aspects/ Symptoms/Diagnosis

Pain in the dorsal region of the hand or wrist when the fingers are extended. The affected tendon sheath sections are tender, and sometimes one can feel the tendons grating against each other.

**Ultrasound and shock waves as well as supports and painkillers help alleviate the symptoms**

### 3. Therapy essentials

Immobilize the joint and ice it if necessary; above all, do not overtax the joint. Anti-rheumatoid agents can quickly relieve pain. Ultrasound and shock waves can also be successful. Supports that exert slight compression and stabilize the entire wrist are recommended. If these measures are unsuccessful, surgery to split or remove any thickened, inflamed tendon sheaths is unavoidable. Injections are also often very beneficial.

### 8. How do FUTURO™ Wrist Supports work?

Thanks to their ability to fit any part of the patient's anatomy and the elasticity of the material, FUTURO wrist supports take the shape of anatomical contours very well. They exert a slight compression on the affected painful parts of the joint and provide some heat.

FUTURO offers two different types of wrist supports:

1. Supports with a brace or splint on the flexor side that covers the entire joint to immobilize it or prevent extreme movement. These supports are suitable for the treatment of all kinds of pain caused by osteoarthritis or other conditions.

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2. Elastic bandages that wrap around the entire wrist preferably with adjustable compression, and support the joint without restricting movement. These bandages are often worn while playing tennis and various other ball games as a preventative measure.

Do not apply FUTURO joint supports to a newly injured joint before a physician has examined it.



Developed in collaboration with a panel of specialized physicians and medical therapists.

Learn More about FUTURO™  
Wrist Supports, [CLICK HERE](#)