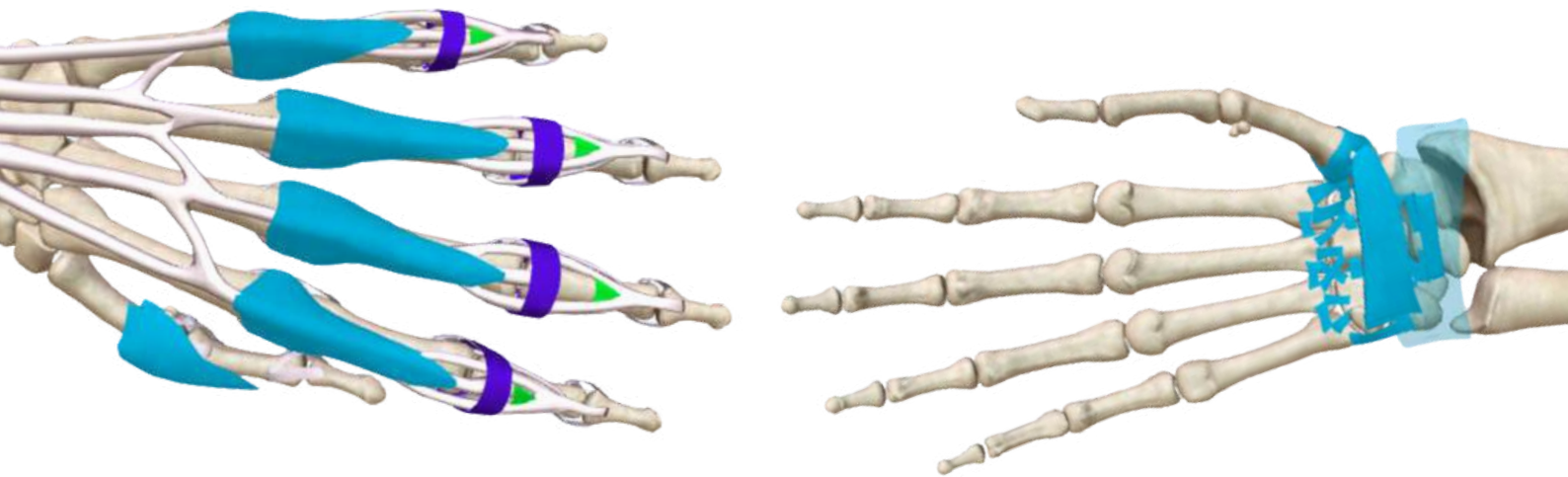


Course Handbook

Wrist and Hand Anatomy BootCamp

Lesson 3: Ligaments of the Wrist and Hand



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- 3: Radioulnar Joint Ligaments
- 4: Radiocarpal Joint Ligaments
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Course Presenter



Khalid Maidan
Specialist MSK Physio



Dr. Jack Hurley
Medical Doctor



Mr. Ray Chari
Consultant
Orthopaedic Surgeon

Ligaments Overview

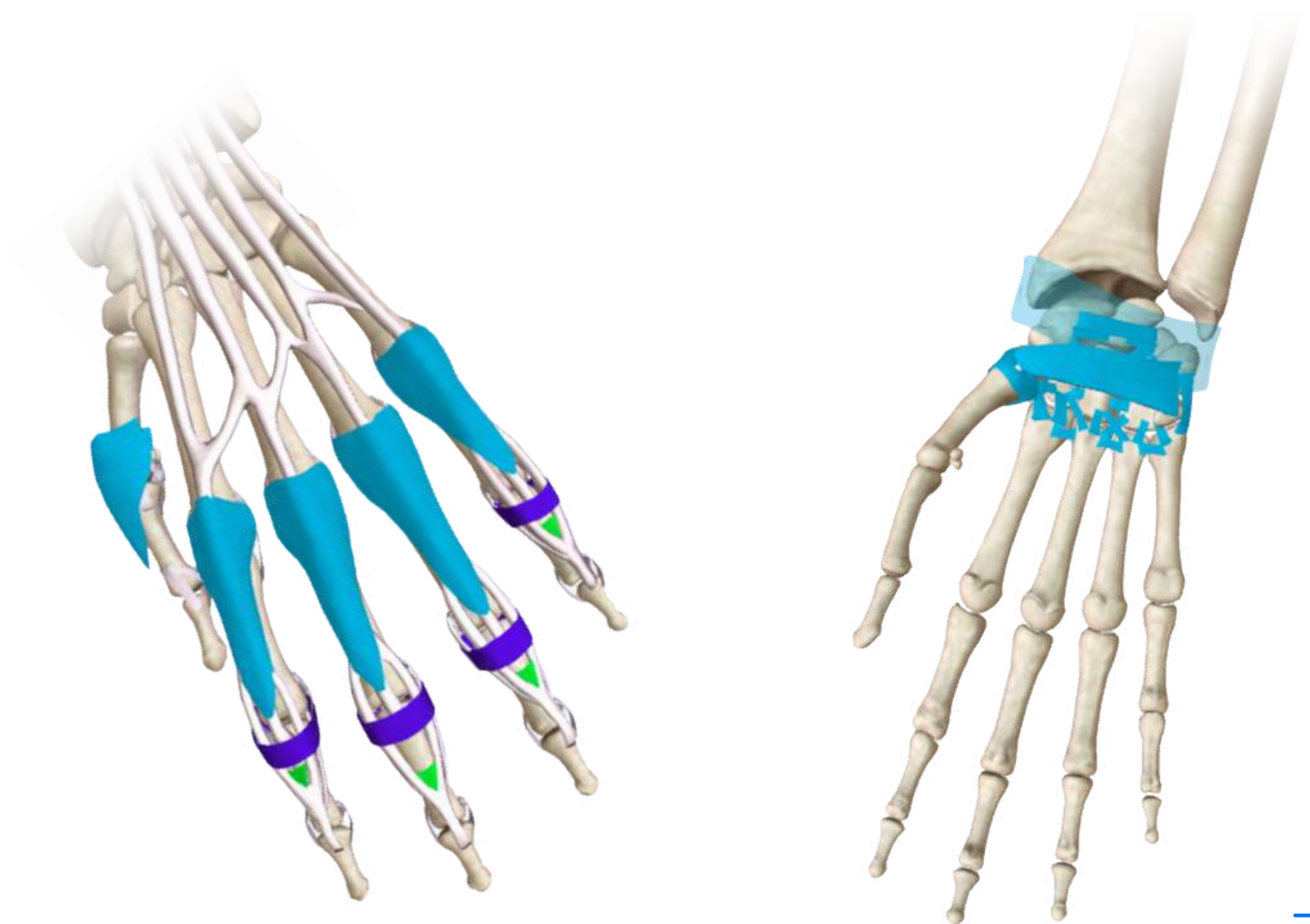
Introduction

In this tutorial, we are going to analyse the different ligaments of the wrist and hand. This is a huge and complex area of anatomy and so we have broken it down into different sections:

- Ligaments of the Wrist
- Ligaments of the Carpal Bones
- Ligaments of the Digits

There are many different sets of ligaments that fit into these 3 categories, and so in this tutorial we have focussed on the ones which are most important to know from an anatomical perspective, and the ones which have the greatest impact on clinical conditions in practice.

We will of course explain these through the course of the tutorial videos, and in the discussion points at the end of the webinar.

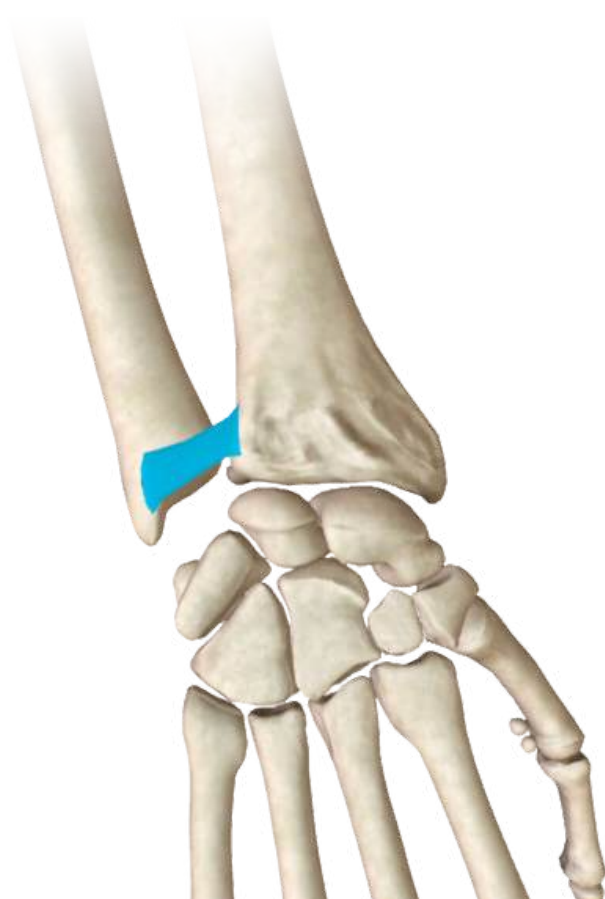


Ligaments of the Wrist

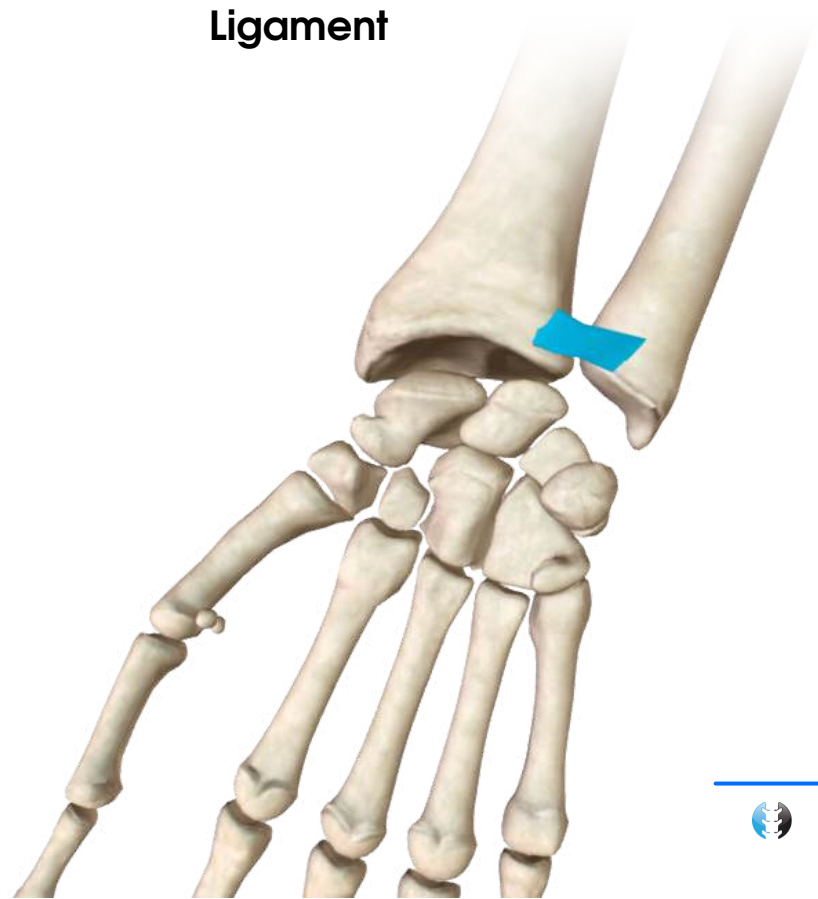
Radioulnar Joint Ligaments

Ligament	Origin	Insertion	Function
Dorsal Radioulnar Ligament	Ulnar notch of radius (posteriorly)	Head of the ulna (posteriorly)	Bind radius and ulna together during forearm supination and pronation
Palmar Radioulnar Ligament	Ulnar notch of radius (anteriorly)	Head of the ulna (anteriorly)	Bind radius and ulna together during forearm supination and pronation

Dorsal Radioulnar Ligament



Palmar Radioulnar Ligament



Ligaments of the Wrist

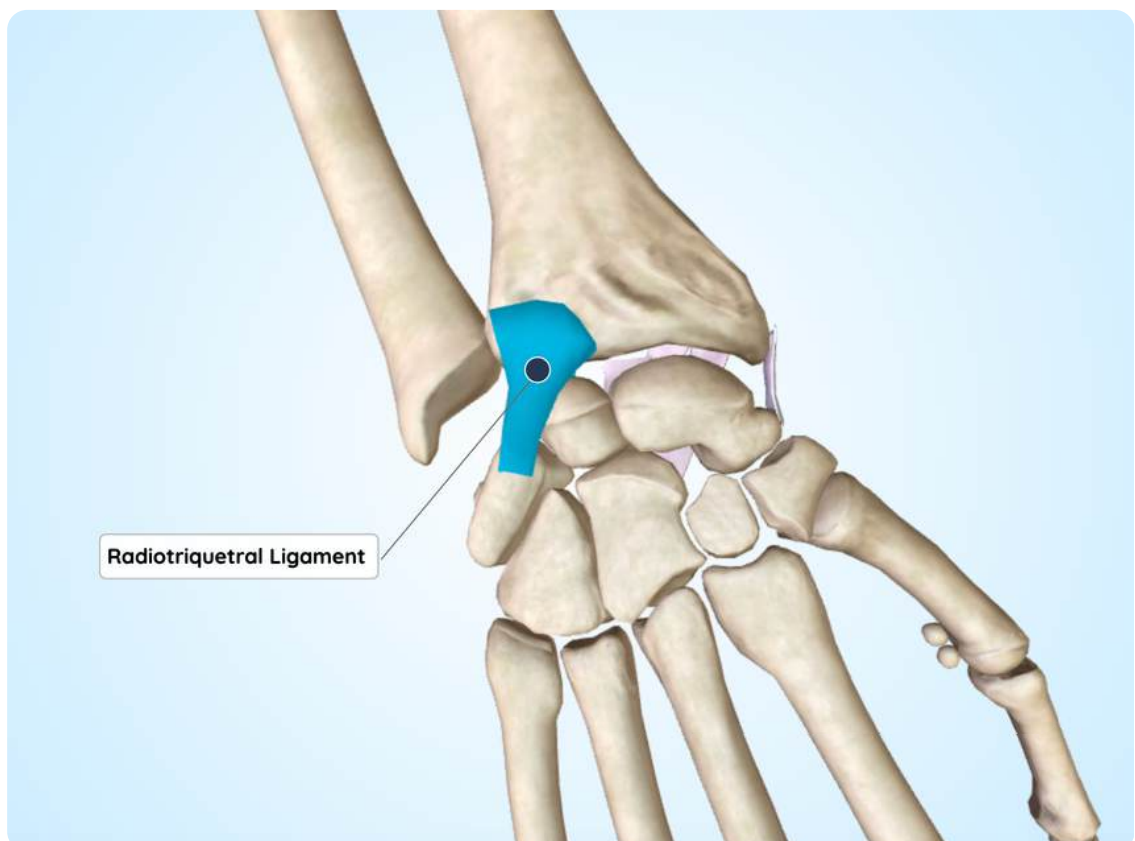
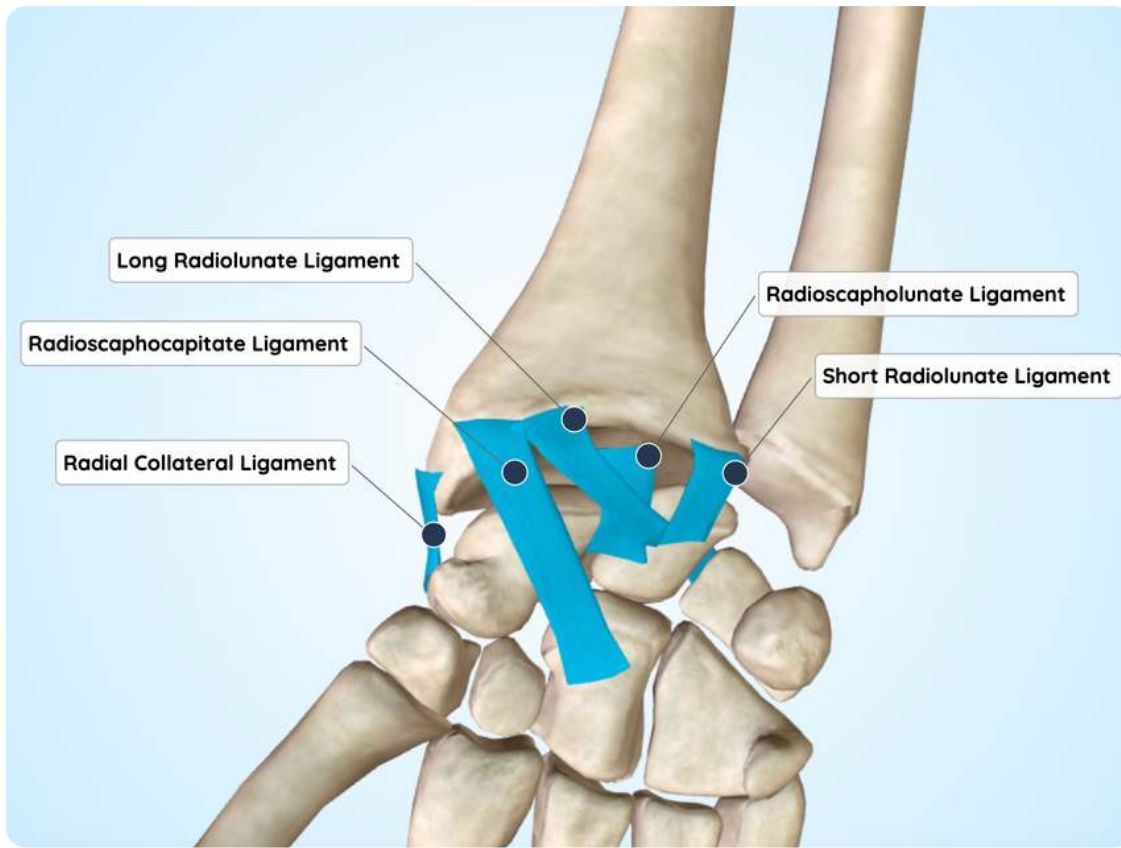
Radiocarpal Joint Ligaments

Ligament	Origin	Insertion	Function
Radial Collateral Ligament	Radial styloid	Distal pole of scaphoid	Stabilise radiocarpal joint at lateral wrist, prevents excessive ulnar deviation
Radioscapholunate Ligament	Distal articular surface of radius	Medial aspect of scaphoid (main insertion) Lateral aspect of lunate	Stabilise radiocarpal joint at the anterior wrist
Long Radiolunate Ligament	Distal radius (anterior to scaphoid fossa)	Anterior surface of lunate	Stabilise radiocarpal joint at the anterior wrist
Short Radiolunate Ligament	Distal radius (anterior to lunate fossa)	Anterior surface of lunate	Stabilise radiocarpal joint at the anterior wrist
Radioscaphocapitate Ligament	Radial styloid	Anterior surface of scaphoid AND anterior surface of capitate	Stabilise radiocarpal joint at the anterior wrist, and bind together scaphoid and capitate for carpal stability
Radiotriquetral Ligament (A.K.A Dorsal Radiotriquetral Ligament)	Medial aspect of distal radius (posteriorly)	Posterior aspect of triquetrum	Stabilise radiocarpal joint at the posterior wrist

Pictures of each ligament on next page



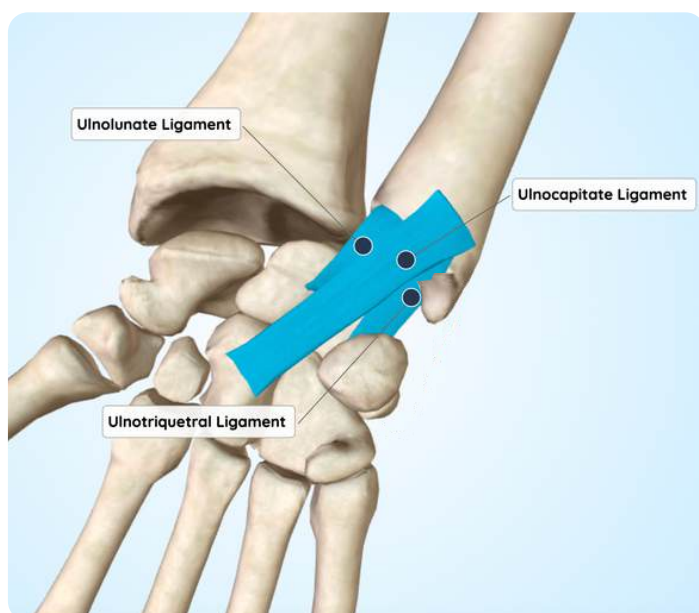
Ligaments of the Wrist



Ligaments of the Wrist

Ulnocarpal Joint Ligaments

Ligament	Origin	Insertion	Function
Ulnar Collateral Ligament	Medial aspect of ulnar styloid	Y-Shaped: One strand to medial triquetrum, one strand to medial pisiform	Stabilise ulnocarpal joint at medial wrist, prevents excessive radial deviation
Ulnocapitate Ligament	Anterior aspect of ulnar head	Anterior body of capitate	Stabilise ulnocarpal joint at the anterior wrist
Ulnolunate Ligament	Anterior aspect of ulna and palmar radioulnar ligament	Anterior surface of lunate	Stabilise ulnocarpal joint at the anterior wrist
Ulnotriquetral Ligament	Anterior aspect of ulna via palmar radioulnar ligament and ulnolunate ligament	Anterior body of triquetrum	Stabilise ulnocarpal joint at the anterior wrist

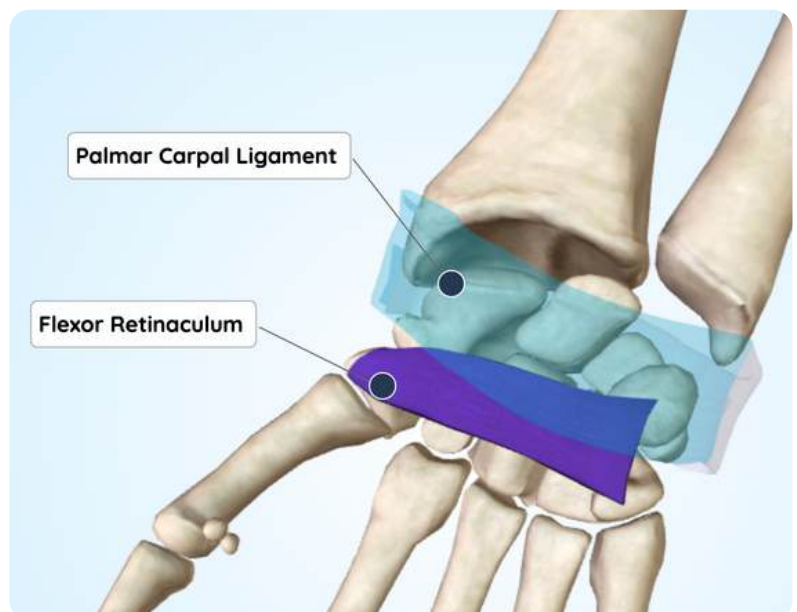


Ligaments of the Carpal Bones

Retinacula and Palmar Carpal Ligament

Ligament	Origin	Insertion	Function
Flexor Retinaculum	Laterally: body of scaphoid and trapezium	Medially: pisiform and hook of hamate	Protect flexor tendons of wrist and hand muscles, and other structures running through anterior wrist such as median nerve
Extensor Retinaculum	Distal, lateral radius	Ulnar styloid, triquetrum and pisiform	Protect extensor tendons of wrist and hand muscles
Palmar Carpal Ligament	Distal, lateral radius	Ulnar styloid, triquetrum and pisiform	Protect flexor tendons of wrist and hand muscles, and other structures running through anterior wrist such as median nerve

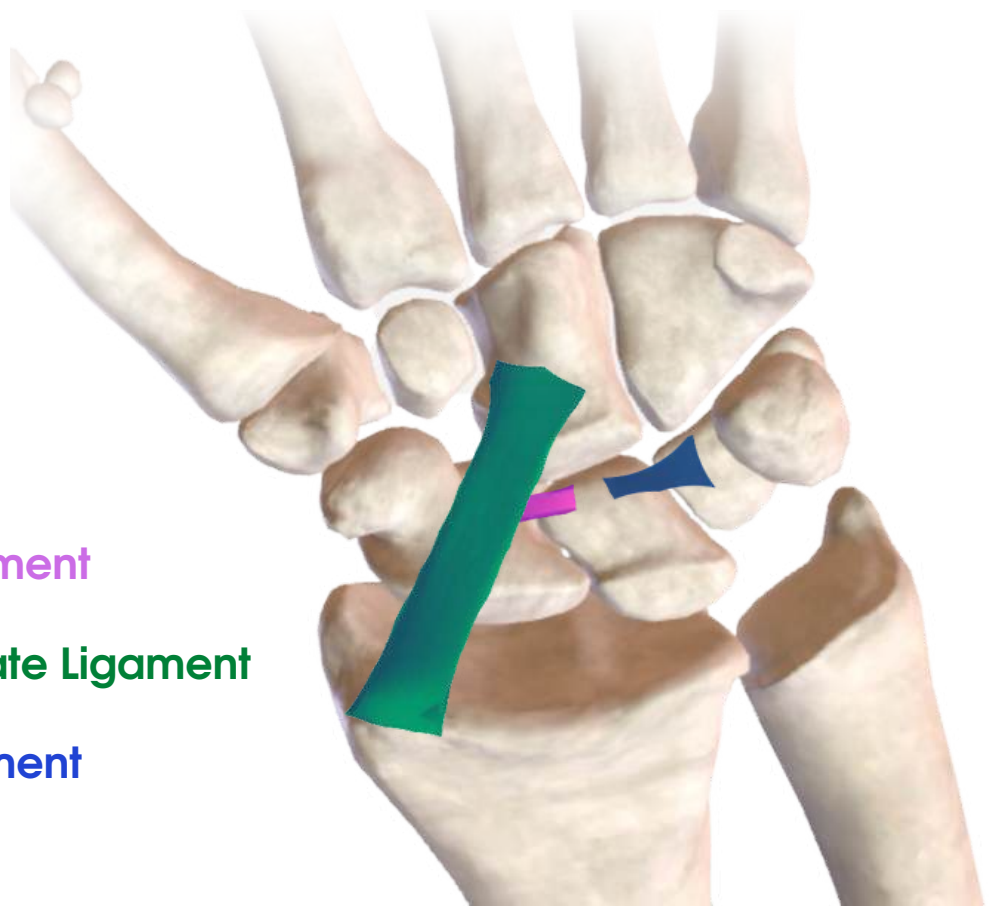
N.B. You will notice the palmar carpal ligament has the same origins and insertions as the extensor retinaculum. Many sources explain that the PCL is actually continuous with the extensor retinaculum, but is located on the anterior/palmar side of the hand, whereas the extensor retinaculum is located on the posterior/dorsal side



Ligaments of the Carpal Bones

Intercarpal Ligaments

Ligament	Origin	Insertion	Function
Scapholunate Ligament	Anterior body of scaphoid	Antero-lateral aspect of lunate	Bind together scaphoid and lunate for carpal stability
Lunotriquetral Ligament	Anterior body of lunate	Anterior body of triquetrum	Bind together lunate and triquetrum for carpal stability
Radioscaphocapitate Ligament	Radial styloid	Anterior surface of scaphoid AND anterior surface of capitate	Stabilise radiocarpal joint at the anterior wrist, and bind together scaphoid and capitate for carpal stability



Scapholunate Ligament

Radioscaphocapitate Ligament

Lunotriquetral Ligament



Ligaments of the Carpal Bones

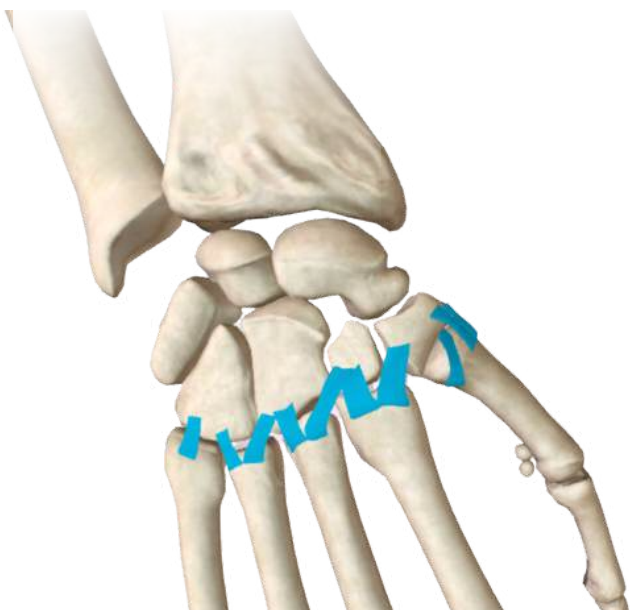
Carpometacarpal Joint Ligaments

Ligament	Origin	Insertion	Function
Dorsal Carpometacarpal Ligaments	Posterior surface of carpal bone of each CMCJ	Posterior surface of metacarpal bone of each CMCJ	Stabilise carpometacarpal joint of each digit posteriorly
Palmar Carpometacarpal Ligaments	Anterior surface of carpal bone of each CMCJ	Anterior surface of metacarpal bone of each CMCJ	Stabilise carpometacarpal joint of each digit anteriorly
Interosseous Carpometacarpal Ligaments	Articular surface of carpal bone of 3rd and 4th CMCJ's	Articular surface of metacarpal bone of 3rd and 4th CMCJ's	Stabilise carpometacarpal joint of 3rd and 4th digits

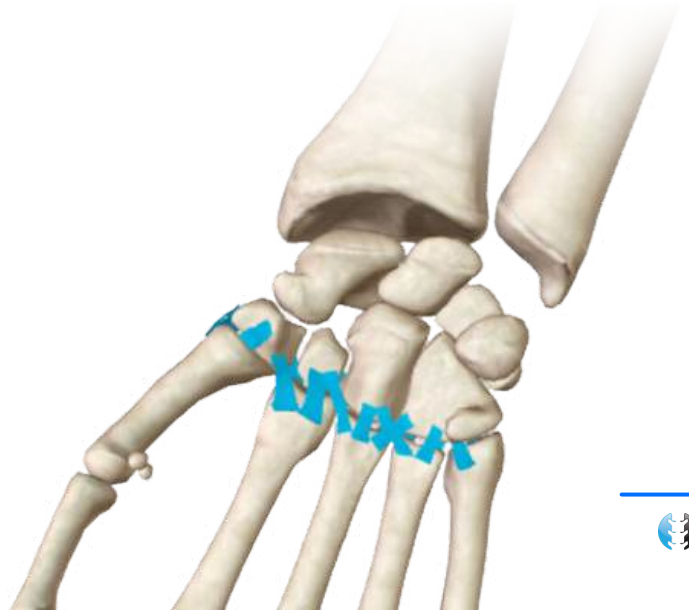


**Interosseous
Carpometacarpal Ligaments**

**Dorsal Carpometacarpal
Ligaments**



**Palmar Carpometacarpal
Ligaments**



Ligaments of the Digits

Metacarpal Ligaments

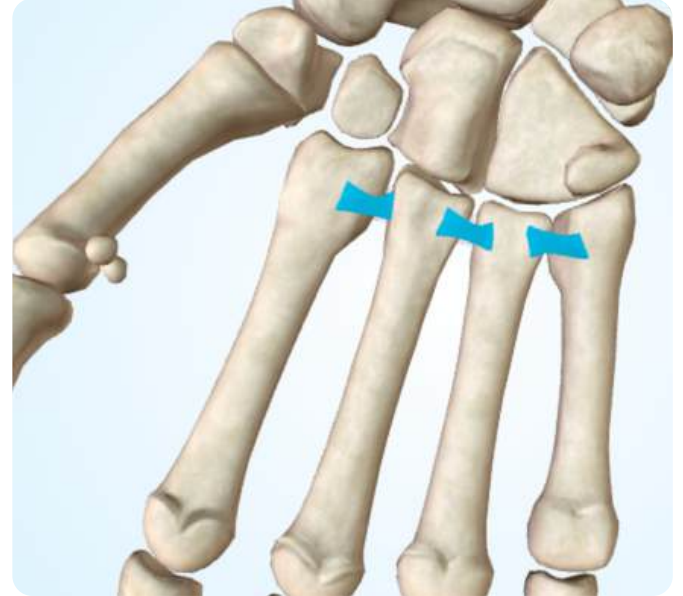
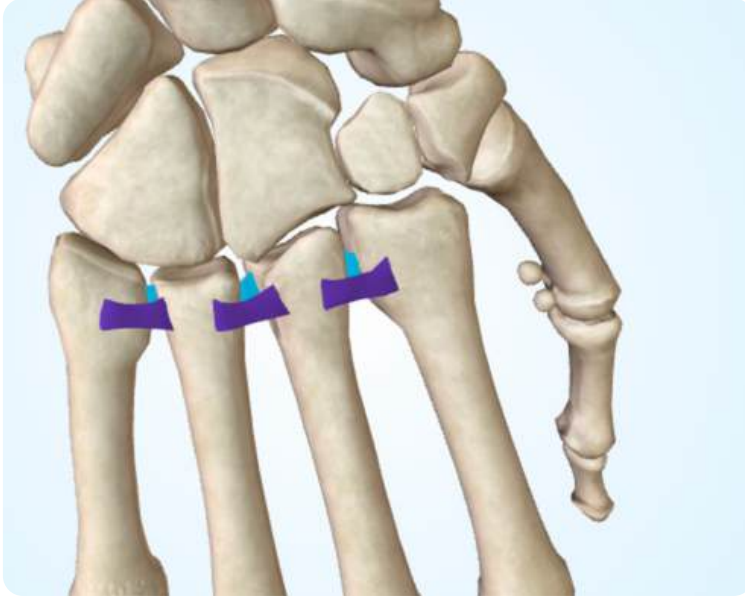
Ligament	Attachments	Function
Dorsal Intermetacarpal Ligaments	Connect bases of one metacarpal to its adjacent metacarpal on posterior surface of hand (digits 2-5)	Bind together one metacarpal to its adjacent metacarpal for stability
Palmar Intermetacarpal Ligaments	Connect bases of one metacarpal to its adjacent metacarpal on anterior surface of hand (digits 2-5)	Bind together one metacarpal to its adjacent metacarpal for stability
Interosseous Intermetacarpal Ligaments	Connect bases of one metacarpal to its adjacent metacarpal through the middle of each metacarpal (digits 2-5)	Bind together one metacarpal to its adjacent metacarpal for stability
Deep Transverse Ligaments	Connect distal heads of one metacarpal to its adjacent metacarpal on anterior surface of hand (digits 2-5)	Bind together one metacarpal to its adjacent metacarpal for stability
Superficial Transverse Ligaments	Connect distal heads of one metacarpal to its adjacent metacarpal on anterior surface of hand (digits 2-5)	Bind together one metacarpal to its adjacent metacarpal for stability

Pictures of each ligament on next page



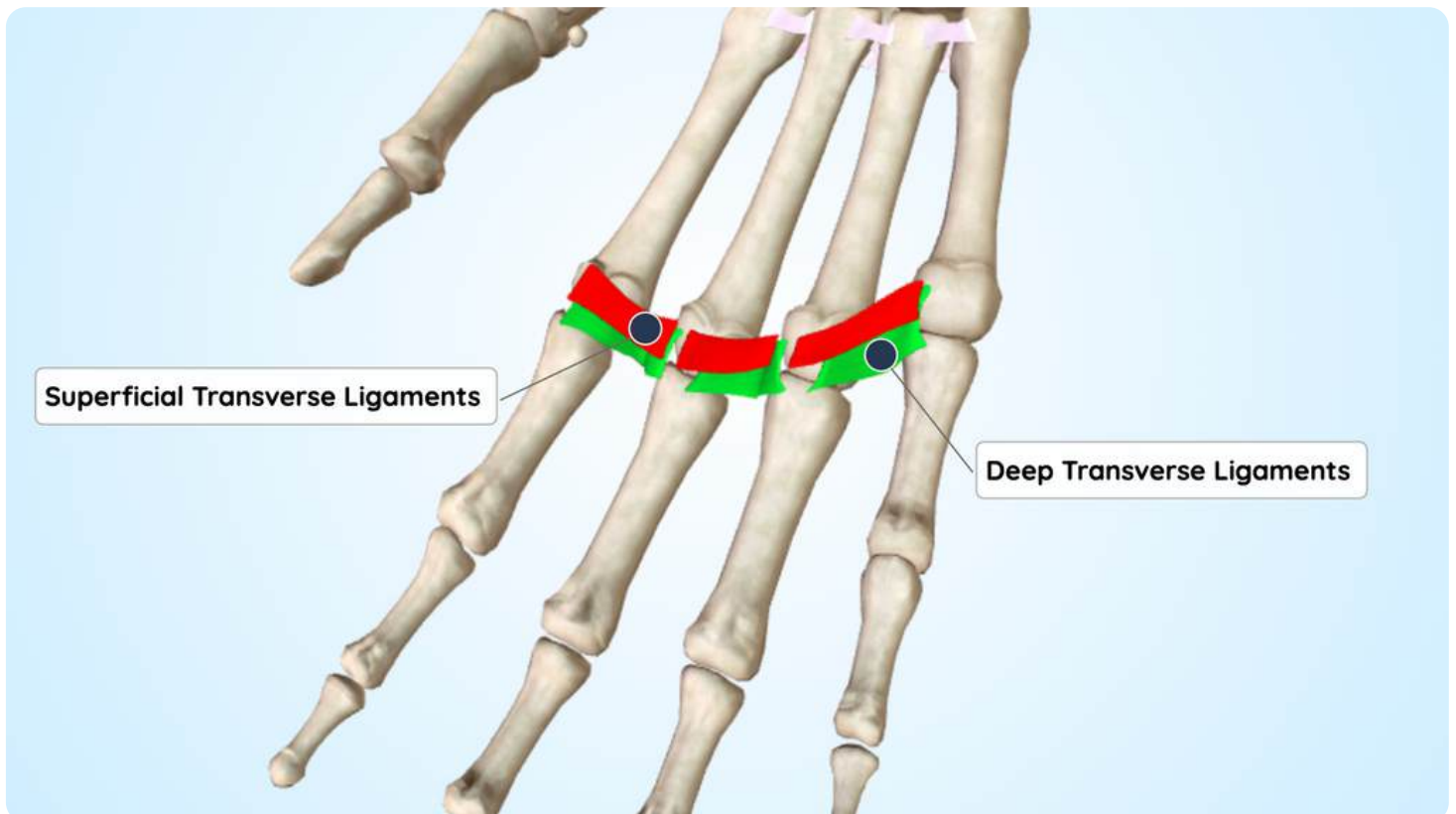
Ligaments of the Digits

Palmar Carpometacarpal Ligaments



Interosseous Carpometacarpal Ligaments

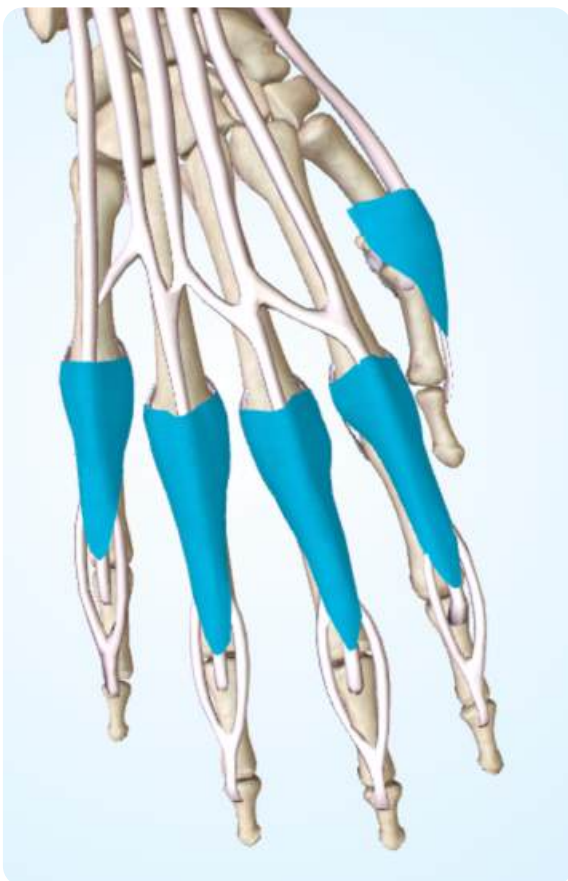
Dorsal Carpometacarpal Ligaments



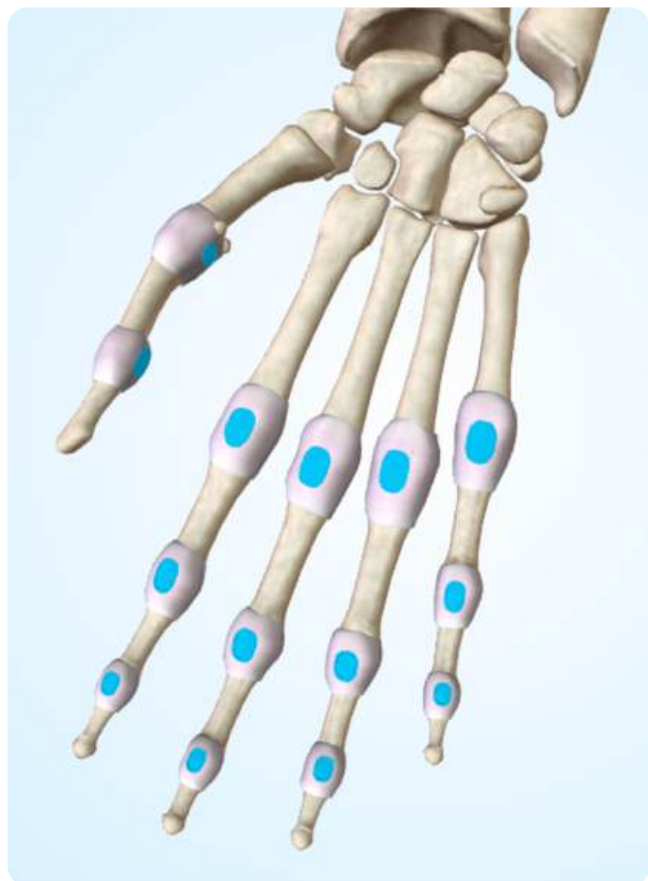
Ligaments of the Digits

Additional Joint Ligamentous Structures of each digit

Ligament	Attachments	Function
Dorsal Expansions (A.K.A Extensor Hoods)	Run over the posterior aspect of each MCPJ. Attaches from metacarpal to distal extensor tendon of each digit (digits 1-5)	Protects the extensor tendon of each digit
Volar Plates	Attaches to joint capsule on anterior/volar side of each digit • Present at MCPJ's of digits 1-5 • Present at IPJ of 1st digit • Present at PIPJ's of digits 2-5 • Present at DIPJ's of digits 2-5	Prevents hyperextension of each digit and provides attachment point for capsule and ligaments



**Dorsal Expansions
(A.K.A Extensor Hoods)**



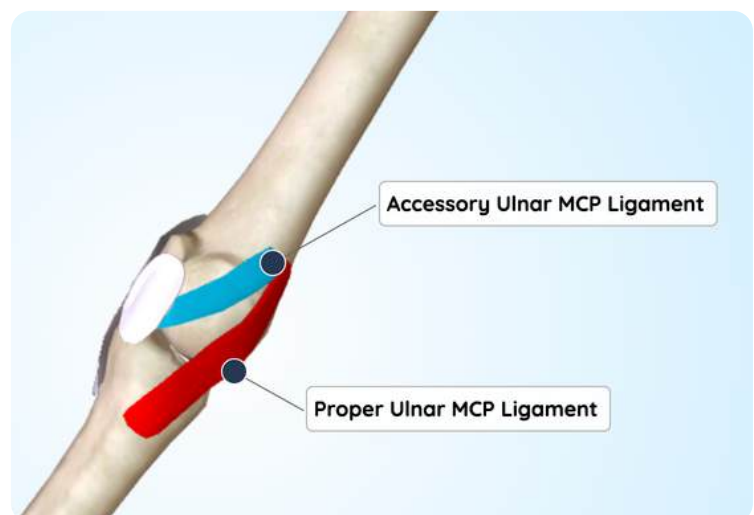
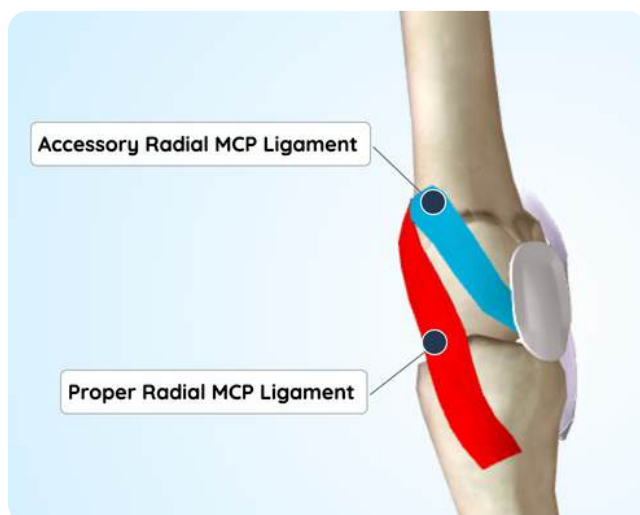
Volar Plates



Ligaments of the Digits

Metacarpophalangeal Joint Ligaments

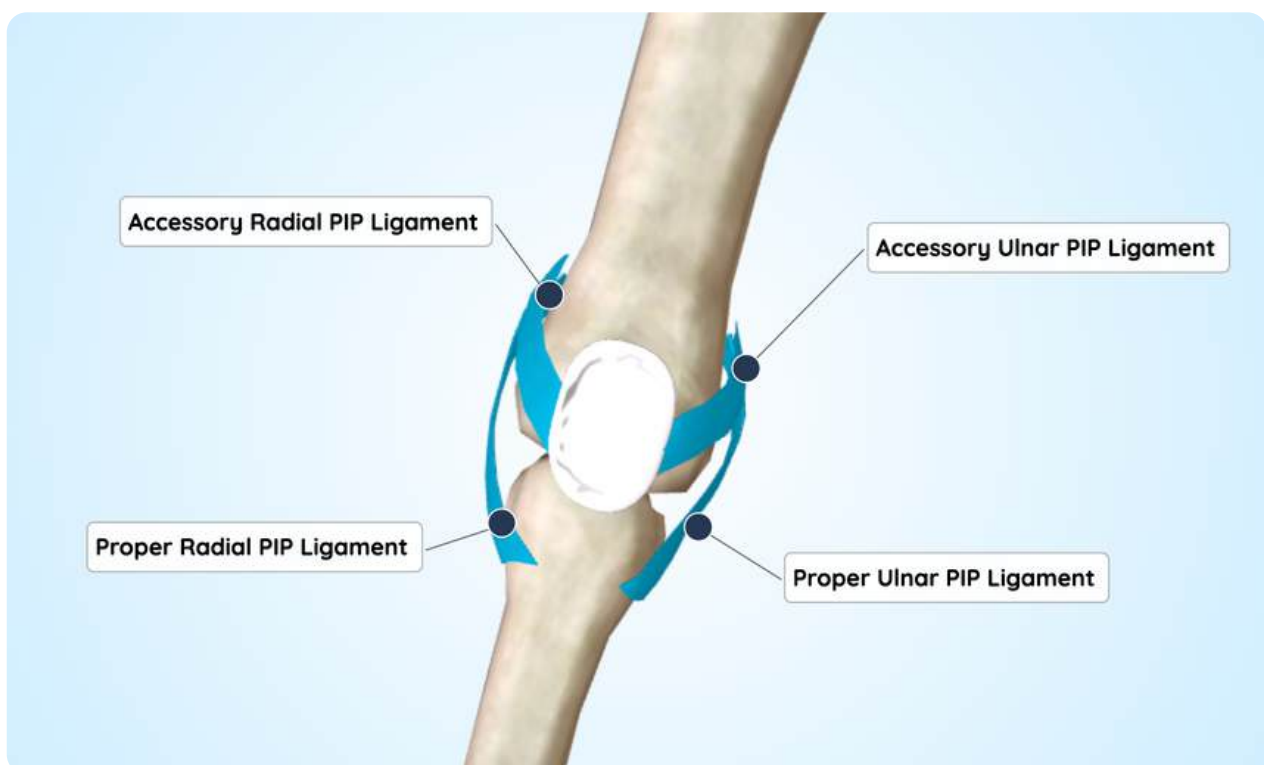
Ligament	Origin	Insertion	Function
Proper Radial MCP Joint Ligaments	Distal metacarpal on radial side of digits	Base of proximal phalanx on radial side of digits	Limits excessive sideways stress on radial side of joint. Also limits hyperflexion of the joint.
Proper Ulnar MCP Joint Ligaments	Distal metacarpal on ulnar side of digits	Base of proximal phalanx on ulnar side of digits	Limits excessive sideways stress on ulnar side of joint. Also limits hyperflexion of the joint.
Accessory Radial MCP Joint Ligaments	Distal metacarpal on radial side of digits	MCPJ volar plate on radial side of digits	Limits excessive sideways stress on radial side of joint. Also limits hyperextension of the joint.
Accessory Ulnar MCP Joint Ligaments	Distal metacarpal on ulnar side of digits	MCPJ volar plate on ulnar side of digits	Limits excessive sideways stress on ulnar side of joint. Also limits hyperextension of the joint.



Ligaments of the Digits

Proximal Interphalangeal Joint Ligaments

Ligament	Origin	Insertion	Function
Proper Radial PIP Joint Ligaments	Distal aspect of proximal phalanx on radial side of digits	Proximal base of middle phalanx on radial side of digits	Limits excessive sideways stress on radial side of joint. Also limits hyperflexion of the joint.
Proper Ulnar PIP Joint Ligaments	Distal aspect of proximal phalanx on ulnar side of digits	Proximal base of middle phalanx on ulnar side of digits	Limits excessive sideways stress on ulnar side of joint. Also limits hyperflexion of the joint.
Accessory Radial PIP Joint Ligaments	Distal aspect of proximal phalanx on radial side of digits	PIPJ volar plate on radial side of digits	Limits excessive sideways stress on radial side of joint. Also limits hyperextension of the joint.
Accessory Ulnar PIP Joint Ligaments	Distal aspect of proximal phalanx on ulnar side of digits	PIPJ volar plate on ulnar side of digits	Limits excessive sideways stress on ulnar side of joint. Also limits hyperextension of the joint.



Ligaments of the Digits

Distal Interphalangeal Joint Ligaments

Ligament	Origin	Insertion	Function
Proper Radial DIP Joint Ligaments	Distal aspect of middle phalanx on radial side of digits	Proximal base of distal phalanx on radial side of digits	Limits excessive sideways stress on radial side of joint. Also limits hyperflexion of the joint.
Proper Ulnar DIP Joint Ligaments	Distal aspect of middle phalanx on ulnar side of digits	Proximal base of distal phalanx on ulnar side of digits	Limits excessive sideways stress on ulnar side of joint. Also limits hyperflexion of the joint.
Accessory Radial DIP Joint Ligaments	Distal aspect of middle phalanx on radial side of digits	DIPJ volar plate on radial side of digits	Limits excessive sideways stress on radial side of joint. Also limits hyperextension of the joint.
Accessory Ulnar DIP Joint Ligaments	Distal aspect of middle phalanx on ulnar side of digits	DIPJ volar plate on ulnar side of digits	Limits excessive sideways stress on ulnar side of joint. Also limits hyperextension of the joint.



Ligaments of the Digits

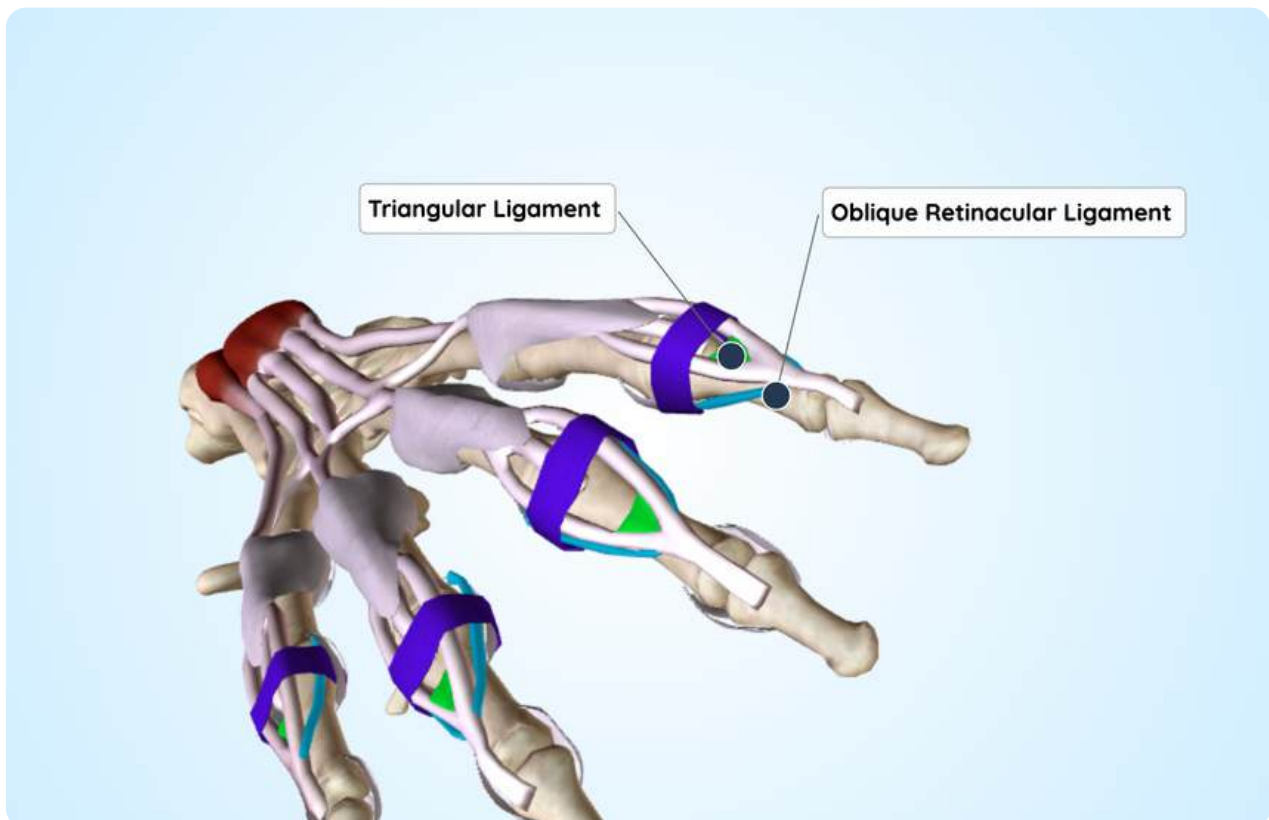
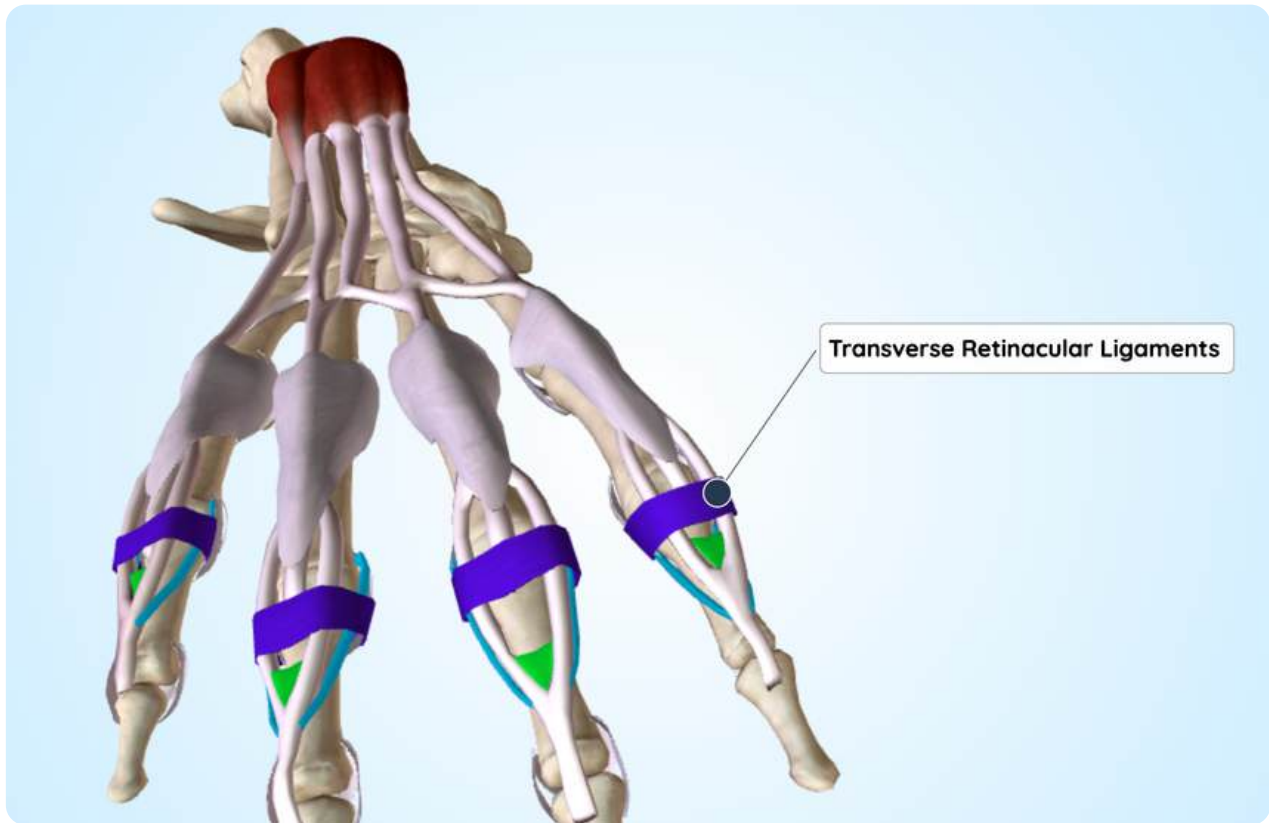
Additional Interphalangeal Joint Ligaments

Ligament	Origin	Insertion	Function
Triangular Ligaments	Located on the posterior side of each digit, between PIPJ and DIPJ. Attaches to both radial and ulnar sided lateral bands of the extensor tendon for each digit.		Key role is to prevent the lateral bands from subluxing in an anterior or volar direction, particularly at the PIPJ itself.
Oblique Retinacular Ligaments	Head of proximal phalanx (one on radial side and one on ulnar side)	Both ligaments converge to insert onto posterior/dorsal side of distal phalanx	Allows for smooth motion between the DIPJ and the PIPJ. When the PIPJ flexes, the ligament relaxes to allow for DIPJ flexion. When the PIPJ extends, the ligaments tighten to allow for DIPJ extension.
Transverse Retinacular Ligaments	Runs from one side of flexor tendon sheath on anterior aspect of PIPJ, over posterior aspect of PIPJ, to other side of flexor tendon sheath. Crucially, they also attach to the lateral bands of the extensor tendons as their main role is to control the lateral bands.		During PIPJ flexion, they aim to pull the lateral bands in a slightly anterior direction. During PIPJ extension, they prevent the lateral bands being pulled too far posteriorly.

Pictures of each ligament on next page



Ligaments of the Digits



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