Biomechanics
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Lecture – 28
Wrist theory

Vanakam; welcome to this video on biomechanics. We have been looking at the biomechanical analysis of the joints of the upper limb. So, in the previous videos we looked at the shoulder joint, elbow joint etcetera.

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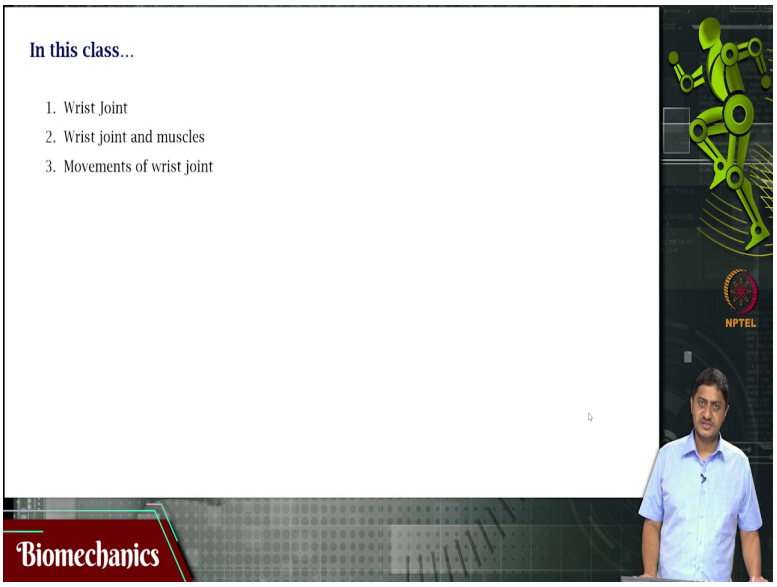

So, in this video we will be looking at the wrist joint, the muscles that span the wrist joint and the movements of the wrist joint.

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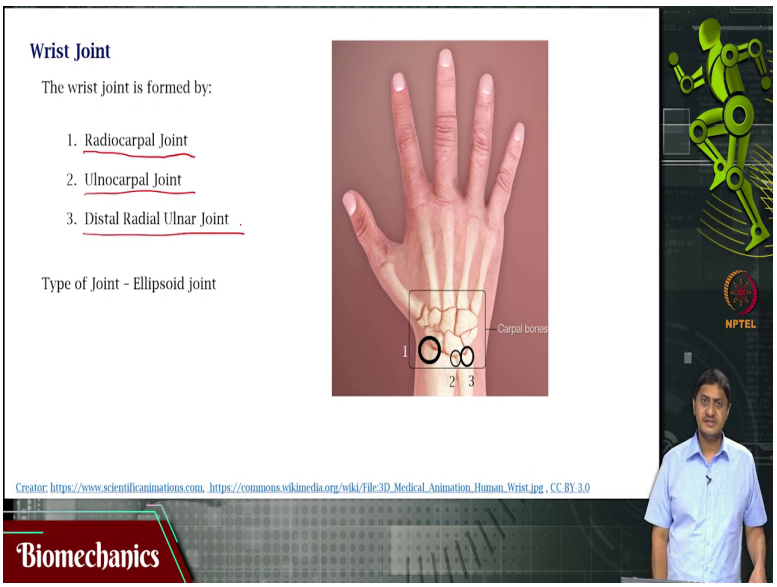

So, what is the wrist joint. So, there are these bones in the hand are the proximal bones of the hand are called as the carpal bones. We saw this trapezium trapezoids graphite lunate helmet etcetera. These eight bones are some of these carpal bones form joints with the radius and ulna of the forearm. So, there are three joints that committed the picture The joint of the radius with the carpal bones are the radio carpal joint.

The Joint of the ulna with the carpal joint ulnar carpal joint and the distal radio ulnar joint, remember when we looked at the elbow we looked at the proximal radial ulnal joint. Here you have the distal joint where the radius and ulna meet once again this is called as a distal radioulnar joint. So, this is ellipsoid joint that means that it will have two degrees of freedom.

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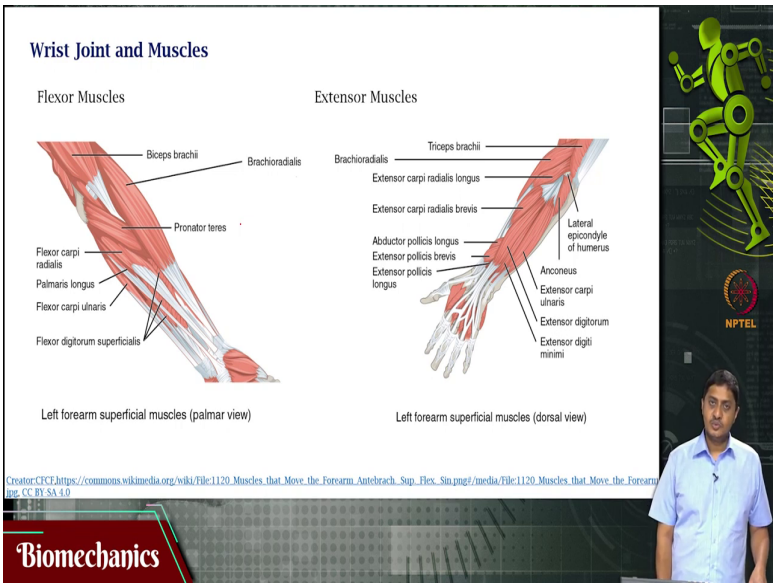

So, what are the muscles that span and supply the wrist joint. There are actually quite a few will be looking at these one by one or at least we will be looking at the most important ones.

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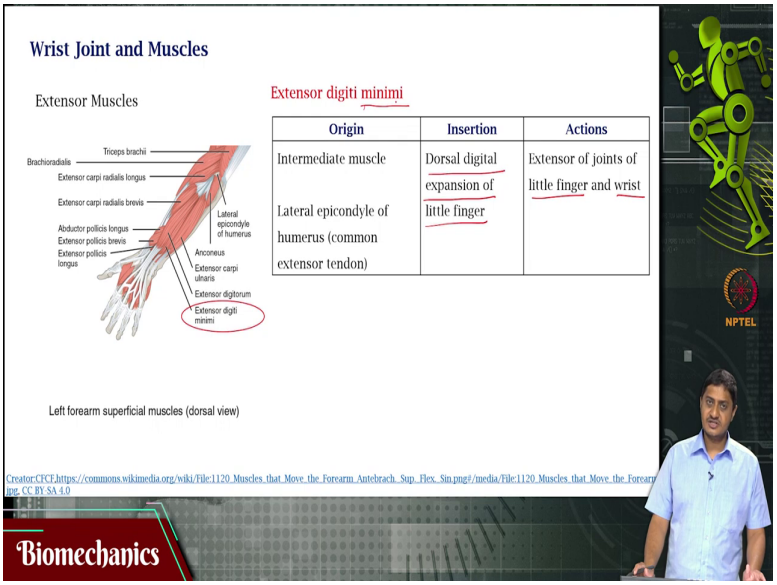

The first of the extensor muscles is the extensor digitorum muscle. It is a superficial muscle and its origin is at the lateral epicondyle of the humerus right. So, it is starting in the upper arm and it inserts and the extensor expansions of digits 2 to 5 that is on the index middle ring little finger is responsible for the extension of the metacarpophalangeal joint of digits 2 3 4 and 5 are for the index middle ring and little fingers is responsible for the extension.

And so, that it is also responsible for extension of the wrist it is also a wrist extensor. Then we move on to extensor digity minimi. This is neither superficial muscle nor a deep muscle this is an intermediate muscle. This also originates in the lateral epicondyle of the humerus. The insertion is on the dorsal digital expansion of the little finger is responsible for extension of the little finger actually for the extension of the MCP joint of index middle ring and little fingers you have the extensor digitorum.

Then you have the extensor digital Minime whenever a muscle name is followed by Minime that means that it is responsible for that action in the little finger. So, and it turns out that this is also an extensor of the wrist.

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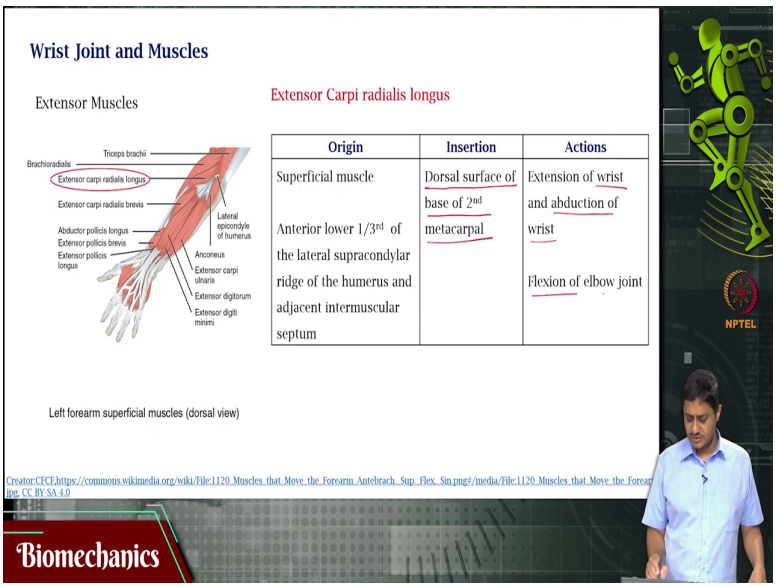

Then you have the extensive carpi radialis longus the long extensor carpet radialis. So, this is a superficial muscle again this is anterior lower one third of the lateral supracontal ridge of the humerus and the adjacent intramuscular septum. So, originates in the upper arm and inserts on the dorsal surface of the second metacarpal. Second metacarpal means responsible for movement of the index finger right extension of the main action is extension of the wrist and abduction of the wrist technically this is called radial deviation of the wrist. The other action partly contributes also to elbow flexion okay.

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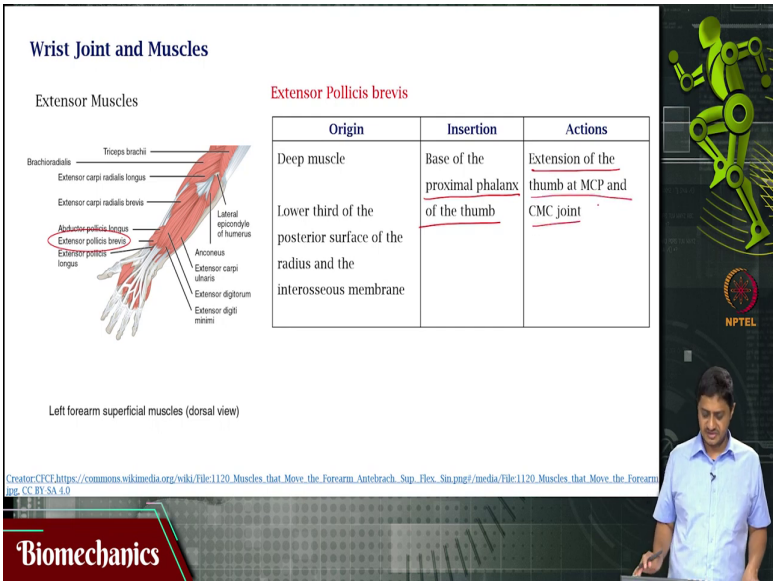

Then you have extensive copy radialis previous this is a superficial muscle this also originates in the lateral epicondyle of the humerus. This inserts on the dorsal surface of the basis of second and third metacarpals. For the first metacarpal for the second; already for the

digital minime inserts on the little finger and earlier we saw the longus attaches to the index finger this one also attaches the index and middle finger.

Again responsible for extension and abduction of the wrist then you have actions or policies brevis. This is a deep muscle this originate in the lower third of the posterior surface of the radius so on the radius on the thumb side of the forearm on the lower third of the posterior surface. So, somewhere here is where it originates right lower thumb. And the interosseous membrane and it inserts on the proximal Phalanx of the thumb.

So, there are only two phalanges in the thumb this is the distal Phalange and this is the proximal phalange at the base of the proximal Phalange of the thumb is where it attaches what would be its function. So, when it contracts it is going to do it is going to pull the thumb in this direction right. So, it is going to perform extension of the thumb at the MCP joint under the CMC joint.

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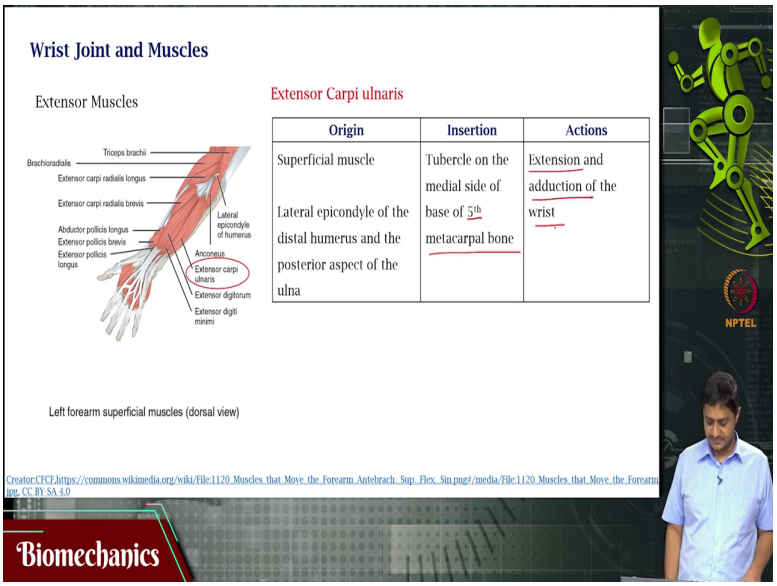

Then you have extensor copy al-naris. This is a superficial muscle it originates again on the lateral epicential of the humerus and the posterior aspect of the ulna on the back side the insertion is under tubercle on the medial side of the base of the fifth metacarpal. Fifth metacarpal means near the little finger right. What is a function and the medial side. So, right the function is extension and a d duction adduction of the wrist.

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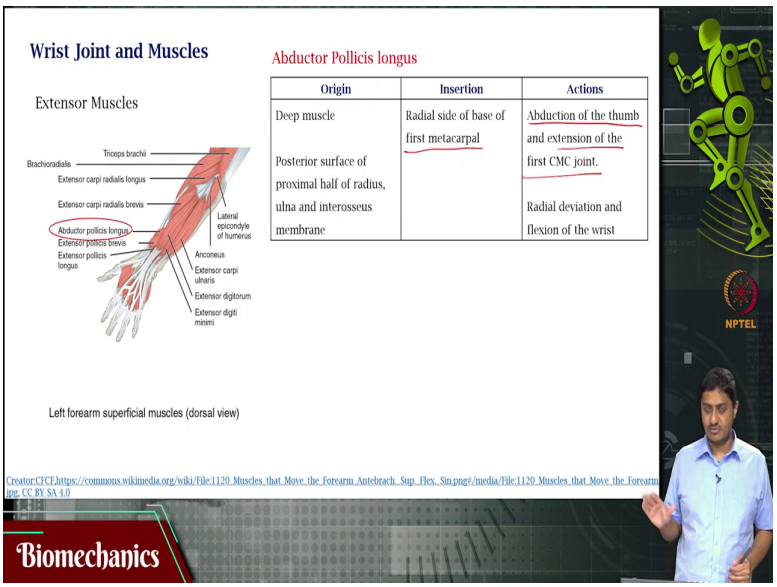

Then you have the long muscle abductor policies longus it is a deep muscle it originates and the posterior surface of the proximal half of the radius ulna and interocious membrane it attaches on the radial side of the base of the first metacarpal. So, responsible for some movement of the thumb may be able to immediately guess because on the radius side of the first metacarpal. Then it is responsible for abduction of the thumb and extension of the CMC joint the first CMC joint. So, is responsible for that moment radial deviation and flexion of the wrist so, that moment.

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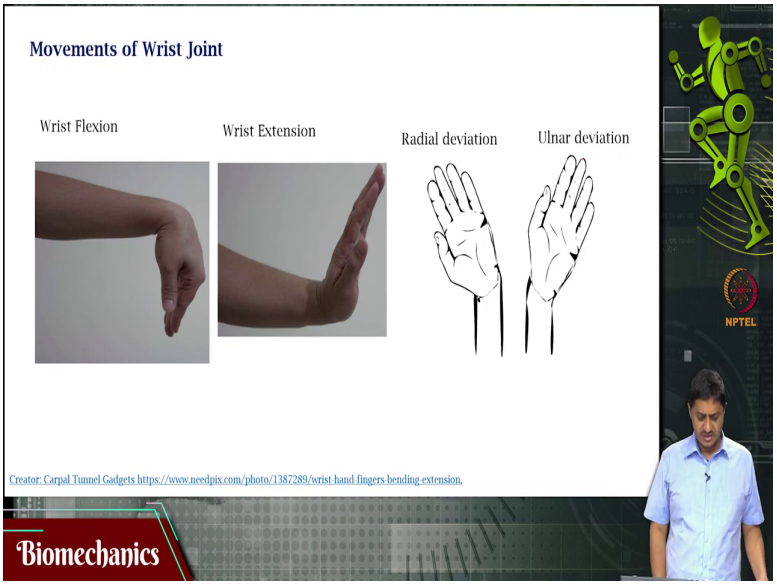

So, now let us discuss the movements of the wrist when I say wrist fraction this is flexion right then you have wrist extension like that this is wrist extension. Then what you would normally call in other segments as abduction is called radial deviation that is deviation

towards the radius radial deviation and what you would call as adduction a d duction is ulna deviation. These are the movements predominant moments of the wrist joint.

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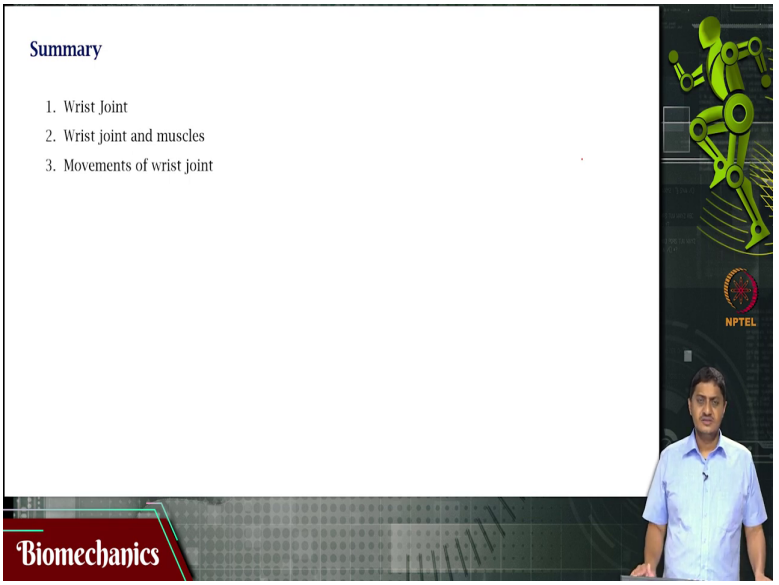

So, with this we come to the end of this video. So, in this video we saw what is the wrist joint? What are these joints? The radiocarpal joint, the ulna carpal joint and the distal radial ulnar joint together constitute the wrist joint. Various muscles that Supply the wrist joint and the movements of the wrist joint with this we come to the end of this video, thank you very much for your attention.