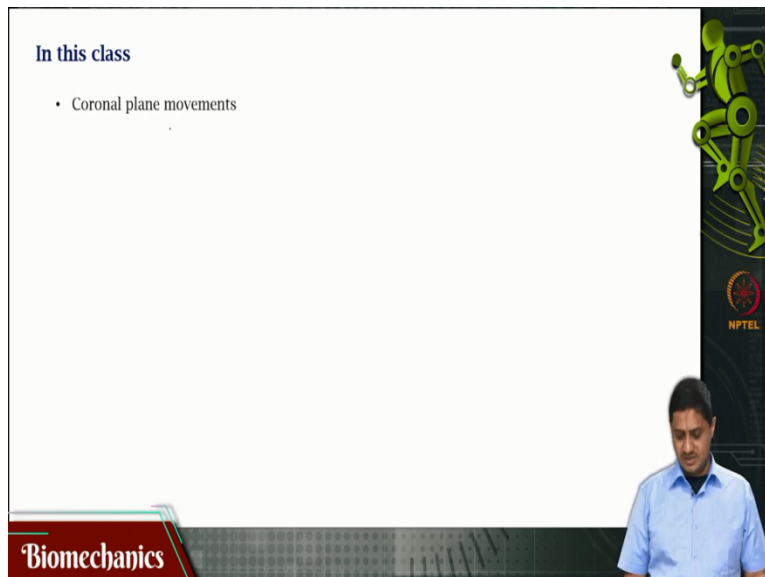


Biomechanics
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Lecture - 13
Coronal Plane Movements

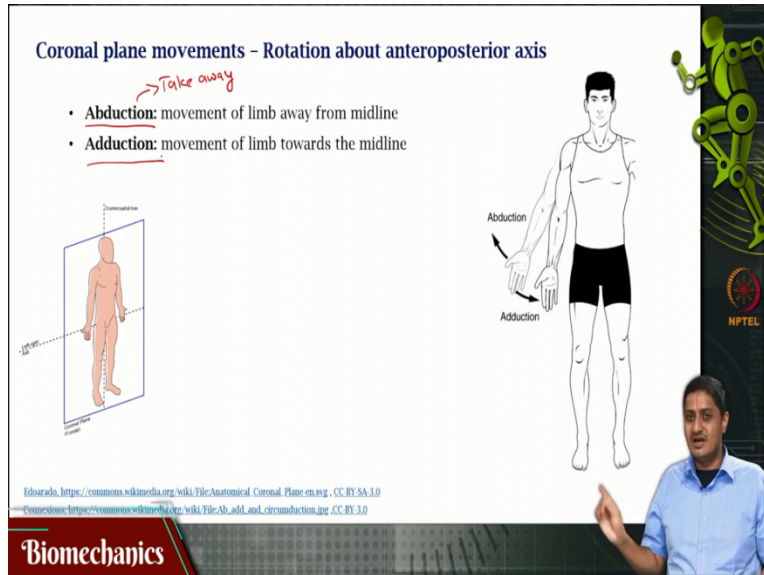
Welcome to this video on biomechanics. We have been looking at basic terminologies in biomechanics, specifically we are discussing how we can consider the human body as a biomechanical system.

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In this video we will be focusing on moments that happen in the coronal plane.

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If moments are happening in the coronal plane these moments must happen about an axis that goes from the back of the body to the front of the body or from the front of the body to the back of the body. In other words, these movements are happening in this plane about an axis that is passing through this plane. What is this axis? This is the anteroposterior axis this plane is called as the frontal plane or the coronal plane.

And the movement is happening about the anterior posterior axis. What kind of movements this? Any movement that takes a particular segment of the body away from the midline is called as abduction. So, I am having my arms like this I am moving my shoulder like that, now my shoulder has are my arm my hole arm has moved such that it has moved away from the midline like this, it has move away from the midline that means it is called abduction.

Now when I am moving back from this position back to the original anatomical reference position such that it is coming closer to the midline it is called adduction. How can you remember the two? Because other than the second letter which is b in the case of abduction and d in the case of addiction, the rest of the spelling remains the same. How can you remember? To abduct means to kidnap or to take away.

When you take a particular part of the body away from the midline that is to abduction. I am doing that that is abduct up that means to take away this is how you remember, otherwise it will

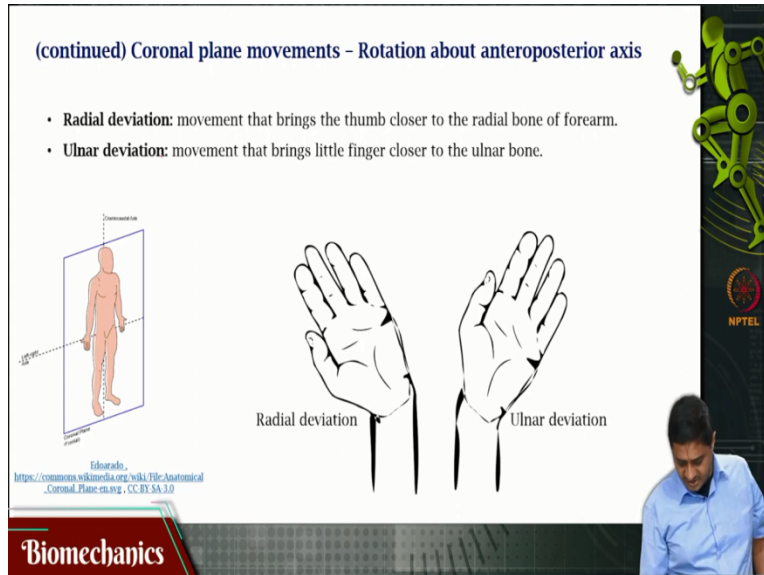
be confusing. Because when we are solving problems, I will say this is subtracted at this angle this part of the body is flexed at this angle then you will have to visualize that posture. So, abduct means to kidnap or to take away that means it is moving away from the midline.

The other one is called adduction of course while you are speaking to avoid confusion sometimes people say a b duction and a d duction but that is not really necessary you can say abduction and adduction or you can also say a b duction and a d duction. That is not so critical but it is critical to remember which is abduction and which is adduction, abduction means to take away. So, that is the shoulder abduction and shoulder adduction.

For example, likewise at the hip abduction adduction, I can do like that like you may not be able to see doing the hip abduction adduction. Can I do elbow abduction adduction? It turns out that that is not so easy because my elbow is a hinge joint it has only the flexion extension that happens in a different plane. I am interested in trying to make a movement in the frontal plane, in the coronal plane that is not I the only movement that I can make is at the shoulder at the elbow I am not able to do this movement.

I am doing I am saying this but this is actually a flexion extension movement I am doing like this. In other words, at the elbow that is only one degree of freedom it is not moving in the abduction, adduction direction at all.

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Then I can also make this movement I can also at the wrist I can make that movement versus this movement. Now because this movement is taking the body taking the segment away from the midline, I can call this as, what is this? This is abduction and this is adduction but again you know that is not how they are called. Like I said in biology exception is the rule this is called shoulder abduction and shoulder reduction.

But this at the wrist a moment that brings the thumb closer to the radial bone of the forearm this is the radial bone, this is the ulnar bone. The bone that is closer to the little finger on the side of the little finger is the ulnar bone is ulnar, the bone that is on the thumb side is called as a radial bone. When I am moving my wrist such that the thumb is moving closer to the radial bone it is called radial deviation you would normally call it as abduction but it is called radial deviation.

When I am doing that for example such that the little finger moves closer to the actually, I am finding it difficult to say in the fluxed position. When you in the anatomical reference position it is easier to show like that is radial deviation when I am doing that such that the little finger is closer to the ulnar it is called deviation. The movement that moves the thumb closer to the radius is called radial deviation.

And the movement that moves the little finger closer to ulnar is called a ulnar deviation, what would otherwise be called as abduction and adduction. Remember we had a similar situation in

the case of the flexion extension of the ankle. Remember we had a similar situation in the case of the flexion and extension of the ankle joint, we call that as plantar flexion and dorsiflexion. Likewise, we now have this radial deviation and ulna deviation. In biology the beauty is in remembering the details and the exceptions.

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(continued) Coronal plane movements - Rotation about anteroposterior axis

- **Elevation:** Movement in a superior direction.
- **Depression:** Movement in an inferior direction.
- **Inversion:** Tilt sole of the foot towards the midline of the body.
- **Eversion:** Tilt sole of the foot away from the midline of the body.

Edwards, https://commons.wikimedia.org/wiki/File:Anatomical_Coronal_Plane.png . CC BY-SA 3.0

Connections, https://commons.wikimedia.org/wiki/File:Elevation_and_Depression.png . CC BY 3.0

Connections, https://commons.wikimedia.org/wiki/File:Inversion_and_Eversion.png . CC BY 3.0

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What other movements are there? Elevation, a movement that happens in the superior direction and the movement that happens in the inferior direction that movement, you know I am opening my mouth like that my mandible is you know going down that is the depression of the mandible. I am closing my mouth and my mandible is going and closing, going up it is called as elevation. Then what else about the coronal about the; are in the coronal plane about the anterior posterior axis.

What other movements are happening? What are the rotations can happen? We said these likewise abduction adduction likewise hip abduction adduction anything else. You can also make a movement within the foot that when it moves towards the inside tilt the sole of the foot towards the midline of the body. Suppose this is the foot and you tilt it towards the midline of the body.

Now that happens that is the inversion and when you do that away from the midline of the body it is called eversion although these movements are not discussed in detail just mentioning this.

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Summary

- Coronal plane movements

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So, with this we come to the end of this video. In this video we saw some moments that happen within the coronal plane. Thank you very much for your attention.