

>> Alright, so now we are moving to the pelvic girdle. And as we talked about with the pectoral girdle, the pelvic girdle is also composed of two bones. And so, I'm going to show you an entire pelvic girdle and then we'll move from there. So, if I'm looking at an entire pelvic girdle, what we're seeing is the on this side we have the left what's called os coxa bone and here we're seeing the right os coxa bone. So, I just want to make sure, just give me a quick yes, okay, that you are seeing my screen and that you're seeing the bone. Okay, great. Thanks, everyone. Thank you, thank you, thank you. Alright, and so, os coxa left, os coxa right, and what we're seeing when we see the entire girdle is how it is attaching to the axial skeleton and, in fact, attaching to the sacrum. So, we know the sacrum is part of the axial skeleton, it's at the distal end of the vertebral column. We know that girdles attach our appendages to our axial skeleton. And the two os coxae are attaching to the sacrum. So, we're going to pull this articulated pelvic girdle back a few times. But in the meantime, as we're getting started, I want to show you – and I'm going to move it over – I'm going to show you a disarticulated single os coxa bone and show you where it would be sitting. This is – and we'll talk about it in a second – this is my right os coxa bone. And this we'll start looking at structures on the disarticulated bone and we'll pull this one back in to look at it a couple of different times. So, what we're looking at with the os coxae – remember, with an E it's plural, just the A is singular, so this is an os coxa bone – is three fused bones that are now called regions of the bone. So, this is an entire os coxa bone. That is what the bone is called. I'm going to move it over here though because I want you to see that this is what we mean by fused bones. So, the os coxa is actually three bones that have been fused together and they're indicated by different colors here on this particular os coxa bone. And so, when we look at – and we'll come up to where it says os coxae at the top right under pelvic girdle in a second – but under os coxae, we see ilium and then ischium and if we turn the page to Page 31, we see pubis. And those are the three regions of the os coxa bone. And so, this large, it's often described as a fan-shaped region, the superior most portion of the os coxa is the ilium. And then the ischium is inferior and posterior and rounded. It's the blue portion of the bone. And the pubis is also inferior but it's facing anterior and it's this gray portion of the os coxa. So, the os coxa is one bone with three regions. And you can see they all meet at this structure, which we're going to look at in just a moment. So, I'm going to put this aside for now and come back to our other os coxa and we're going to start underneath where it says os coxae and name some structures. We're going to start with the sacroiliac joint. So, that word sacro- sounds like sacrum and what did we just say that sacrum is where the os coxa attaches to the axial skeleton. So, I'm going to move this out of the way and bring our articulated pelvic girdle back and I can see where the sacrum and the os coxa meet is right in here. This is an anterior view, this is a posterior view, right? Here are the spines, the spinous processes of my vertebrae, so I know this is posterior. And so, where the sacrum meets the os coxa that is called the sacroiliac joint. And so, I can see where they join here, but how am I going to tell where it is on a disarticulated bone? On a disarticulated bone, I need to look for a rough area where the sacrum

would be joining. And this rough area, I'm going to tell you where it is and I will identify it again in just a few minutes, on the posterior – because where's the sacrum? Posterior. This rough area on the posterior of the os coxa is where the sacroiliac joint would be formed. So, we'll look at it again. For now, we're just going to know this really rough surface is where the sacroiliac joint would be forming. We also have the obturator foramen. We know a foramen is a hole. We have one hole on this bone, this really large hole we're seeing right here. It's called the obturator foramen. The word obturator – I don't know if this helps – means stopper like a rubber stopper. You can imagine [clicks tongue] popping in a rubber stopper right there. Obturator foramen. Next on our list, acetabulum. The acetabulum is this very large indentation for the head of the femur. Acetabulum. So, here's what we want to write besides the fact that it articulates with the head of the femur. It is going to be located on the lateral aspect of this bone because where's my appendages? Where are my appendages? They're on the lateral aspect of my body hanging off the side of my body. So, in order for my femur to attach, the structure where it articulates also needs to be located laterally, right? Let's look at it for a second. Here's the femur. Here's the acetabulum. Boom! Ball and socket joint. We'll look at that again in a second. But the important thing to remember, the lateral position so that my femur can hang on the side of my body, not down the middle of my body. Next, pubic symphysis. [inaudible] going to pull back the articulated pelvic girdle. This is an anterior view. I know that because here's the sacrum. The sacrum is posterior. I know that the fan-shaped structure is the ilium portion of the bone, I know that the rounded portion of bone is the ischium, and the anterior portion of the bone is the pubis. And a symphysis is a specific type of joint. We're going to be talking about joints and specific types of joints in lecture next Tuesday. And so, as we're talking about these specific types of joints, one of the types of joints is called a symphysis. And a symphysis, the definition of a symphysis is where two bones come together with a piece of fibrocartilage connective tissue. And we've mentioned this before, fibrocartilage connective tissue is always found in a pad shape. There's a little pad shape in between the bones. These are also symphyses. These are symphyses, these fibrocartilage connective tissue pads in between the bodies of the vertebrae is another example of a symphysis. So, in between the two pubic portions of bone, pubic symphysis. So, let's do this. Let's bring our disarticulated os coxa back. Here is the pubic portion of the bone. So, if I didn't have this and I just had this I should be able to say – oh, we're frozen. Sorry. Here. This is just a matter of turn it off/turn it on a couple times and we'll be okay. Just hang in with me. It'll be okay. Just working on bringing the camera back, everyone. So, hang in there. We'll be back up in just a second. I'm doing the turn it off/turn it on method. Make sure everything is plugged in. I'm going to stop the show for just a second so I can get this back up online. It's one of those technology days. It was going so smoothly. Hold on. Turn off, turn on. I'm still here by the way. This is taking longer than it usually does but hang in there. There it is. Okay. Well, there you go. Don't know why but we're back. Don't know why we were gone, but now we're back. Alright, going to share my screen. There it is. Let me get to

our chat [inaudible]. Alright, everyone. Are you back on? Are you back on with me? Did you see my hand wave through there?

>> Yes.

>> Thank you. Alright. All is well. There will be a little lag in our recording, but that is okay. So, what I was showing you then, if I can remember what I was showing you, is this idea of looking for the pubic symphysis without the entire pelvic girdle. And so, what do we know? We know that the rounded edge is the ischium, the opposite edge is the pubis, and so this is where the pubic symphysis would be formed even if we don't have the entire pelvic girdle to assist us. Pubic symphysis. Next, we're going to go to just the ilium portion of the bone. So, remember the ilium is the fan-shaped portion of the bone and the structures that we'd be looking for on the ilium would be the iliac crest. A crest is a round ridge. So, here is the round ridge called the iliac crest. It is the superior most edge of the bone, the iliac crest. Next, we have what are called anterior superior spine and inferior superior spine. I'm going to skip those for just a second, and you'll see why, and go to the fourth bullet, greater sciatic notch. So, notch this big indentation. This is a notch. And the greater sciatic notch, if we look to the right-hand side of the page, tells us that what passes through there are the largest nerve trunk in the body, the sciatic nerve. If you know anything about the sciatic nerve or sciatica, you know that if someone has sciatica that the pain is in the lower back through the hip into the thigh. So, posterior. And this greater sciatic notch is on the posterior of this bone. And we're identifying that because that is going to help us identify the anterior superior spine and the anterior inferior spine. If this is posterior, this is direction is posterior, then this direction is anterior. Opposite. And we're going to find those anterior spines at the anterior edge of the crest. So, here's the crest. This is the anterior of the crest because this is the posterior of the crest because here's the sciatic notch and it's posterior. So, if I follow the crest all the way to where it comes to a point, that is the anterior superior spine. It's not much of a point but there is a bit of a point right there. And then, if I drop underneath that, even less of a point, this is the anterior inferior spine. So, we'll follow the crest to find the anterior superior spine and go just inferior to it to find the anterior inferior spine. The next part of the bone we're looking at is the ischium. The ischium, remember, is the rounded portion. It's posterior. Now that we know that the sciatic notch is posterior, then we know that the ischium is here, this rounded structure. And the ischium has a spine too, ischial spine. So, this one is pointed. And so, at the – let's follow the sciatic notch. The sciatic notch if we follow it to its inferior edge we get to the ischial spine. So, the sciatic notch ends at that sharp ischial spine right there. Right there. And the ischium has a tuberosity. Again, rough like somebody took sandpaper. And the whole rounded edge of the ischium is rough like sandpaper. The whole thing is the ischial tuberosity. And then, lastly, if we turn our page to Page 31, again, we come to the pubis. So, the ischium is posterior, sciatic notch, and round, the pubis is anterior, opposite of posterior, anterior, and it's flat. Pubis. This is the os coxa. And, again, this structure here, the acetabulum, articulates with the head of the femur, which

is the bone we're looking at next. So, on the femur, this is really long. So, here's what I'm going to do, right? We start with the head. We know the head is medial. The head is medial because it has to attach to the midline of my body. So, here's the head, here's the neck, the constricted region, head, and neck. So, I'm going to just start on this proximal end. The head is proximal. And then, I will move the bone to the distal end. So, head, constricted neck, and then a structure called the fovea capitis. So, the word fovea means pit. Capitis means head. So, we're going to look right here and we're going to see the pit in the head of the femur. Pit in the head, right? And so, there's the pit in the head, fovea capitis. Head, neck. Then we have greater and lesser trochanters. And trochanters are only found on the femur, okay? We will not have trochanters on any other bone. And they are large projections near the head proximal end. So, this large projection and this large projection. And so, again, where are they located? This is more proximal, greater trochanter, more distal, lesser trochanter. Greater, lesser trochanters. Give you another view. [inaudible] greater, lesser trochanter. More proximal, more distal. Greater and lesser trochanters. Then, we're going to move down the diaphysis. Remember, the length of the bone is called the diaphysis or shaft. I'm on the posterior of the bone right now and I'm going to skip down to the last bulleted item, linea aspera because the linea aspera is on the posterior shaft of this bone. And it's this ridge that we're seeing, this sharp ridge that runs the length. You can kind of see it as I move my finger along that. It's a sharp edge that runs the length of the shaft on the posterior edge of this bone. Let me try a different angle to give you a little bit better. No, I think it was best over here. You can kind of see how it's throwing a shadow here. You can see that sharp edge called the linea aspera. All the way down to the distal end of the bone where I have condyles. Smooth, round knobs. Definitely knobs on the femur. And so, I'm going to take this back, take this back, take this back, take – here's the linea aspera head. Always medial. This is the same side as the head. Always medial, always medial, always medial, always medial, always medial. So, this is medial as well. If the head is medial, then the same side on the distal end is also medial. So, medial condyle, lateral condyle. Same side as the head. Then I have, again, some epicondyles. We talked about those before. Epi- means next to the condyles. And they are smaller projections that are next to the condyles. So, smooth, round condyle, and then this bump is the medial epicondyle and this bump is the lateral epicondyle. This is posterior. And here's why I want you to write. This is not on the list, but I want you to write this. This very deep indentation is called the inter-, meaning in between, -condylar as in condyle. Intercondyl-A-R. Intercondylar fossa. So, this deep fossa is in between the condyles. And I want you to write it down, intercondylar fossa because the intercondylar fossa is posterior and that would help me orient the bone correctly. So, I'm going to do this, posterior. Head is lateral. Intercondylar fossa is posterior. This is how it sits in your body. I can see the chat now. Right or left? What do you think? Right or left? This is posterior. Right or left? Everyone? Uh-huh. Yes! You've got it! Right, right, right, right, right! It is right. Head facing medially. This is posterior. This is the side it would sit on in your body. Good, good, good,

good, good. I do want you to see [inaudible] thing on the distal end. Condyle is posterior. I'm going to turn this anterior. These condyles are huge. They move all the way to the anterior of the bone. These are a continuation of the condyles here. And so, I'm going to bring the bone in this position. This is the head now. I'm going to set my shish kabob stick. Move, move, move, move, move. So, this is medial condyle, lateral condyle. Medial epicondyle, lateral epicondyle on the femur. Nice! Next, patella. The patella is the kneecap. Here's what we want to know about it. The apex – remember, we talked about apex last time? It forms a V. It is inferior. And these two condyles articulate with the condyles of the femur. The patella articulates with the femur only. It does not articulate with any other bone. So, the condyles of the patella articulate with the condyles of the femur. [inaudible] wanted you to see that. Patella. Tibia/fibula bones in the leg. Alright. So, let's write a couple of things before we look at them. The tibia, the larger, wider, thicker of the two bones, is medial. The tibia is the medial bone in the leg. The fibula, the thinner bone, is lateral. That makes sense because all of my body weight is being distributed to the center of my body and I need this thicker bone along the midline to help balance my weight. We'll come back to the fibula. Let's look at the tibia first. So, as I'm looking at it. Let me show you the whole thing, right? This is the proximal end to distal end. And notice at the distal end, we're going to name this in a second because of the sharp projection. Let's go back to the proximal end. On the proximal end, it is called the head. The proximal end of this bone is called the head. But we have some structures that we need to know in this region, the proximal end. We have a tuberosity. So, the tibial tuberosity is this rough area of bone on the anterior proximal edge. So, it's rough, anterior proximal tibial tuberosity. The tibia has condyles too! The femur had medial and lateral condyles, so does the tibia! That look like this. The condyles on the tibia are on the proximal-most end of the bone. Look at that. Smooth, round surface. What are these articulating with? Here's my femur. The condyles of the femur articulate with the condyles of the tibia. Boom! Love it! Now, here's what we need to know though. Which is medial and which is lateral? Okay. This is the posterior of the bone because, remember, the tibial tuberosity, the rough part, is anterior. I turned it posterior. Here are my condyles. I'm going to move the bone. Move the bone. [inaudible] – let me go back and forth a little bit and see if I can get some better – alright. The proximal end condyles – move, move, move. I'm posterior until I get to the distal end and this structure I mentioned to you before, which is the last structure on the list, medial malleolus. Medial malleolus is your ankle that if you cross your leg over your thigh, it's that bump on your ankle on the inside of your ankle. That is your medial malleolus. And if that is the medial malleolus, and it is, – I'm laying a stick down. Medial malleolus. Then everything on that side is also medial. And so, this would be in a medial condyle. That makes this the lateral condyle. Look at it again. Leave my shish kebab stick. Move it, move it, move it, move it, move it. Medial malleolus. Medial aspect of the bone. That is the ankle you can feel on the medial part of your ankle. Medial condyle. Lateral condyle is the opposite. I do want to show you one more thing. I'm going to show you this structure.

We're going to come back to it in a second. But it's not on your list, but you need to be aware of it. It's a little articulating surface right here. See that little smooth surface? That little smooth articulating surface, we'll look at it in a second, is for articulation of the head – I'm bringing it over – of the fibula, which we're going to look at next. So, this is how the fibula and where the fibula articulates with the tibia. Move the tibia out of the way. Here's the fibula. Alright, the fibula is a little bit tricky. So, I'm going to show you how we're going to identify really the only two structures we need to know, the head and the lateral malleolus. They're on opposite ends. The head is proximal. So, the head of the fibula, if I look at it, again, it's square. It kind of has a square shape to it. [inaudible] a little bit more. So, it has kind of a square shape, the head, proximal end versus, dun, dun, dun, dun, dun, dun, dun, – I'm going distal. The distal end has a point on one side and a curve on the other. And this whole end is the lateral malleolus. So, now, I want you to feel the bump on the outside of your ankle. That bump is your lateral malleolus right there. So, point and curve distal end lateral malleolus. Back up here. Head square. Square shape. Articulates with the head of the tibia. Okay? We're going to come back to those in a second. Last bones that we want to see are in the foot. So, the foot has some similarities to the hand. All of these bones are bones of the ankle. They're called tarsals. And I need to know two tarsals – oop! Oop! Oop! Is there a name for that – sorry, Maya [assumed spelling]. Is there a name for that articulation? The one that articulates the tibia and the fibula? So, there aren't names for the articulations. There are names of the type of joint. So, for instance, when we talked about the pubic bones where they meet, that is called a pubic symphysis, but only because the joint that forms between the bones is called a symphysis. So, we don't name all – joints don't have names, they have a category. And so, it doesn't really have a name, it just would be a category, okay? Good question. And that will make a little bit more sense when we have our discussion about joints on Tuesday in lecture. And that will all kind of make a bit more sense. Good question though. Very good. So, some of those joints have those specific names, but it really is just telling you the type of joint that it is. Good question. So, all of these are called tarsals. The bones of the ankle are tarsals. I need to know two tarsals by name. And they do all have names, but the two I need to know are the bone of the heel, which is called the calcaneus. We'll look at it disarticulated in a second. And the bone that – I'm going to say superior. I know it's actually proximal, but the way they sit on top of each other it's easier to think of them as this is inferior and this is superior. So, the calcaneus is inferior to the talus. And the talus is the bone that is going to articulate with the tibia and fibula. And I'm going to show that to you in just a second. So, we'll look at these two bones in particular. We must know them by name. But the rest we're just going to say tarsals. And then, just like bones of the hand, the bones of the foot are metatarsals and bones of the toes are phalanges. And they too are numbered. And the numbering starts with the large toe, number one. One, two, three, four, five. So, this would be the first metatarsal, second metatarsal, fifth metatarsal. These are same numbering. First group of phalanges, second, third, fourth, fifth. And the

phalanges have the same groupings, proximal, middle, distal. That is probably not a good one. Here's a better one. Proximal, middle, distal except number one, just a proximal and a distal phalange. So, it'll use the same kind of naming that we did with the hand on the foot. One, two, three, four, five. And on the phalanges, proximal, middle, distal. Toe tips are distal. These two bones now, calcaneus and talus, look like this. Here's the bone of the heel, the calcaneus. And so, we can see, right, that it looks [inaudible] opposite side, but we're seeing the look of that bone-like so. This is the part that is the heel. That kind of rounded posterior. That is what you know is the rounded posterior portion of your heel. This is the [inaudible] here is – opposite side, but here's the talus. And this is how they are articulating like so. And this, the talus, this superior and bilateral edges of the talus, are where the tibia and fibula articulate. So, now I've got a foot with a tibia and fibula attached. Medial – the large toe is medial. Tibia is medial. And I can see – give it to you from this position. This is an anterior view. Here's the talus. This is the medial malleolus. This is the lateral malleolus. And both of those bones articulate at the talus. So, it's a nice view of that. Beautiful! Beautiful! Yes? There they are. Oh, my gosh! That is all the bones! What? Alright. We're going to take 10. We'll be back. And I have some last things to share with you today. I'm going to stop the recording. Take 10! Be back at a couple minutes after 4:30. Four thirty-two or so.