

>> Deb Feickert: Yes, hello. We talked about this, and this hopefully enough is going to feel somewhat familiar because we had this lecture on the entire skeleton, including the appendicular skeleton. But we didn't say a lot about the appendicular skeleton, we pretty much just listed the bones. But because now we're going to talk about it in a bit more detail. And, as always, we're going to go in order at the kind of halfway point on page 29 and move through from proximal to distal on our list. And so we're looking at the pectoral girdle, and we're remembering that a girdle is a group of bones. And I shouldn't even say group. Two bones that connect the appendages to the axial skeleton. And that word "girdle" means circling or encircling. And that's what they do, they kind of circle around the axial skeleton to attach those appendages. So, we're going to start with the bone called the clavicle. And we used to call it the collar bone. I want you right now to feel the – right – right now feel the collar bone at the anterior of your body. And what you're feeling, and we're going to get to all these structures in a minute, but what you're feeling is this large bony curve. That's why the clavicle kind of sticks out in your thoracic region, because of this large bony curve. So, I don't have any structures listed under the clavicle, but here are the things you need to know as we're starting – going to be starting to think about not just the bones and the structures on the bones, but how do the bones articulate with other bones? So, we're going to start pointing that out on the appendicular skeleton a bit more specifically. So, we have this S-shape, kind of an oddball S-shape, but certainly kind of a double curve S. And when we're looking at the clavicle and determining how it's positioned in the body, we're going to see that one end of the clavicle – I'm going to just tilt it up slightly – switch this back out, sorry. Is a bit more square, kind of a square. And the other end of the clavicle is kind of flat. It's more flat. And so the square end of the clavicle is the part of the clavicle that articulates with the manubrium of the sternum. And I'll show that to you in just a moment. And the flat end of the clavicle articulates with the structure we're going to look at in a second, that I will also show you, called the acromion, or acromion process of the scapula. The other thing I would show you, it's not on your list, but the clavicle has this little tubercle, right? A tubercle is a small bone. And the tubercle of the clavicle is inferior. So, the way it's sitting on the table right now is the way it would be positioned in your body. And this large bony curve – this large bony curve, not the indentation of the curve, but the bony curve, is pointing anterior. That's what we just manipulated when we felt that with our hand. So, in our body, positioned just like it is right now, if this is articulating with the sternum, the manubrium of the sternum, and this is articulating with the scapula, then make a guess right now. I'm going to walk away just for a second to grab a sternum. Make a guess right now as to if this is how it sits in your body, is this a right or a left clavicle? Type it in. [inaudible] question marks, just say it and be proud. Say it and be proud. I like it. And with a capital, I like it. Okay, excellent, excellent, excellent. I would say, well, for each guess [inaudible] that the correct answer is left. This is a left clavicle. Here is the sternum. Put it this way. Here's the sternum, and that bone sits like so. Not exactly how it articulates, but I just wanted you to see it. So, this is how the

sternum sits in your body, right? So, this is the sternum, this is the posterior sternum. And this is the left clavicle. We'll put our sternum up here for now. And the other bone that it articulates with, I'll set it down like so, and then we'll start talking about it, is the scapula. And it articulates something like – I'm going to set it down. It's actually up here, but it articulates something like this, okay? When we're looking at the clavicle and the scapula. And I'll also [inaudible] start back up. We're going to look at the upper appendage first today, take a break, and when we come back we'll look at the lower appendage. And when we start, I'm going to bring an articulated skeleton over and start showing you the entire skeleton as best I can with this doc cam. All right, so let's move our clavicle out of the way. The important thing here, if we were to see it disarticulated, would be that I know that this end articulates with the manubrium of the sternum, and the flat end articulates with the acromion or acromion process, which we're going to look at in just a moment, of the scapula. So, here is the scapula. The scapula is what we used to call the shoulder blade. This is the posterior of the scapula. So, again, this is how it would sit in your body. If I were to stand it upright, which I'll do right now, this is the anterior of the scapula, this is the posterior. So, this is how it's sitting in your body right now. And I'm going to tell you how you're going to identify that correctly in just a moment. Let's start with the glenoid cavity, also called glenoid fossa. We know what a fossa is; a fossa is a concave structure. And let's just write for the glenoid cavity that the glenoid cavity or glenoid fossa articulates with the head of the humerus. Articulates with the head of the humerus. And the humerus, right, put yourself in a standard anatomical position right now. The humerus and my whole upper appendage are on the lateral, right, both of my appendages are bilateral aspect of my trunk. And so my humerus has to attach to the lateral aspect of this bone, because my humerus is hanging out over here. I'll give you a humerus just so you can see, right? This is how the scapula and humerus are sitting in your body, like so. And so we're going to come to the humerus next, but I just want you to see that this is how it sits in your body currently. So, I'll put the humerus aside, come back to the scapula. Glenoid cavity is where the head of the humerus articulates, and it's this oval-shaped structure on the lateral aspect of the scapula. Glenoid cavity, glenoid fossa. So, you will see views of the scapula like this in your atlas. So, this is lateral, head of the humerus, sits in your body like so. The next structure on your list, spine. Couple of definitions for spine. One is sharp point, the other is long slender ridge. And here's the long slender ridge of the scapula. Long slender ridge. The spine of the scapula that's going to help me identify right and left. The spine of the scapula is posterior, right? This is the posterior of the bones. Right now, again, I want you to reach back, reach back and feel your shoulder blade. And if you run up and down the edge of your shoulder blade, you're feeling the spine. So, posterior. The spine in the scapula is posterior. And let's set it up. Again, this is how it sits in your body. This is anterior, this is posterior, and here's the spine. Long slender ridge. The next structure is called supraspinous fossa. Okay, let's break down the word. Supra always means above. Always means above. Spine is the spine. Fossa is a, right, concave indentation. Here's the

spine. Above the spine is an indentation called the fossa; supraspinous fossa. Superior. Now, again, let's talk about, okay, why are we – why are we learning some of – why are we learning this Professor Feickert? [inaudible] question, because next – or, not next. After the joint we're going to start talking about muscles, and a lot of the structures we're talking about are going to be associated with muscles we're going to learn. And if we know that this is the supraspinous fossa, which we know now, we'll also know where to look for the supraspinatus muscle. Boom, right there. Sits right there. Pretty much the same name. If I have a supraspinous fossa, I must have an infraspinous fossa. Right here, here's my spine. Infra means under. There's that concave space. Infraspinous fossa, another muscle that we'll learn later, sits right here. Infraspinatus muscle. This is posterior. Next on my list is another fossa, subscapular. We're going to now move the scapula anterior. Always remember your view. You'll see both of these views in your resources. So, subscapular fossa, right? This entire indentation on the anterior aspect is the subscapular fossa. What are we going to find there? What do you think? Yeah, muscle called the subscapularis muscle. The acromion we talked about already. And we mentioned already the acromion is where the clavicle articulates with the scapula. It's called acromion or acromion process. And the acromion is going to be found at the lateral edge of the spine. This is the acromion. This structure we're seeing right at the – right, this is lateral, here's the glenoid fossa. Right on the lateral edge of the spine is the acromion. And, again, the acromion is the structure that articulates with – this is actually called – I'm going to put this like this. This is actually called the acromial end of the clavicle, and this is the sternal end of the clavicle. So, this is the articulating surface of the clavicle with the scapula at the acromion, this process called the acromion. Again, at the lateral edge of the spine. Lateral. And then, lastly, we have a coracoid process. All right, we've already seen a coronoid process. The coronoid process was on the mandible. And we said that the coronoid process, with an N, means "bird's-beak-like." So does coracoid. I don't know, it just – I don't know. Coracoid process means bird's-beak-like. I've one more process, boom, there it is. Boom, bird's-beak-like, coracoid process. So, it's on the anterior aspect of the bone. And those two processes kind of surround the glenoid fossa. So, we said that the acromion articulates with the clavicle. What's this process for? Again, if we're looking at structures and it's not because of an articulation, it's probably because a muscle we're going to look at attaches here. And that is why we're looking at the coracoid process. So, again, I'll put it – right, this is how it sits in your body. Superior, anterior, posterior, humerus is over here. I think you've already guessed. What do I have here, a left or a right scapula? Left or right? Write it down [inaudible]. Left or right? I need to stop making – that was like a left and right, Vanessa. I got you though. I have to start – stop making funny sounds, apparently, in our recordings because the program doesn't know quite how to – how to caption those. I guess it's kind of fun. Yes, yes, yes, so we're going to be looking today – I know, I know. We're going to be looking today at the upper appendages. The upper appendage. I have all left bones today; I'm going to point out how we would identify. So, on a scapula, how would we know if it's left or right? We

look at two things; the spine has to be posterior, the glenoid cavity is lateral. And when we look at those two items, then we know which bone we're looking at. So, what I – what you might do, right, we should have our highlighters handy. Highlight or maybe make a little asterisk next to glenoid cavity and spine because if I – if I'm looking at those correctly placed, I can determine if I'm looking at a right or a left bone. Okay, I'm going to walk away for just a second and find a right scapula to compare it for you. Okay, so here's a right – right scapula. What am I looking at? Spine is posterior, glenoid cavity is lateral. What else did I bring? So fun, it's going to be so fun. A right clavicle. Fat end is medial, it's going to articulate with the manubrium of the sternum. Thin end is lateral, it's going to articulate with the acromion. Dun-dun-duh, building a skeleton. Scapula. Next on the list is the humerus. And so I'll see if I can get the whole humerus in your view here. I hope so. I might have to do a little bit of manipulating on the humerus, and I apologize for that. So, on the – so here [inaudible] here is – I'm going to show you the entire humerus like so. Proximal end, right? This is a long bone, so it has a proximal end and a distal end. And I'm going to focus in on the proximal end because that's where our list starts. So, as I'm focusing in on the proximal end of the humerus, I start with what's called the head. And so the head of a long bone is most often – not always, but most often this kind of smooth round structure, and almost always on the proximal end. The other thing about the head of a long bone is that the head is going to be positioned medially, toward the midline of the body, because this is where it's attaching to the axial skeleton. So, if the head is medial, and it is, then everything else – I'm just going to run down the bone. Everything else on the same side of the head is also medial. And that's important to us because we're going to name some structures that have the word medial in them, and we need to know that if the head is medial everything else on that side is also medial. So, the head is medial. The neck – there are two necks on the humerus. The one we're looking at is called the surgical neck. And this is the surgical neck, this whole area that's kind of in – indented here, just distal to the head. This is the surgical neck. Just for grins, this is – this is called the anatomical neck right here. But the surgical neck is the one we're looking at, head, neck. Greater and lesser tubercles. So, a tubercle, again, is a bump. And so I have two bumps adjacent to the head, one here and one here. And so as I'm looking at these bumps, I'm looking at – sorry. As I'm looking at these bumps – let me pull this up a bit for you. As I'm looking at these tubercles, I'm looking at their positioning. And the greater tubercle, which is this bump right here, is slightly more proximal than the lesser tubercle, which is here. Greater tubercle sits up a bit higher and lesser tubercle. Greater and lesser tubercles adjacent to the head of the humerus. Greater and lesser tubercles. What are they there for? Whenever I – why do I have these bumps on bones? Because muscles are attaching and pulling on that part of the bone. I have what's called – we're going to move down to the – we're going to move down to the distal end now. We go up, up, up, up. This is the shaft or diaphysis. Not on your list, but we'll come to that when we look at joints. And now we're looking at the distal end of this bone. And this is the distal and anterior aspect of this bone. So, I'm

going to come back to – we’re going to flip this bone over and look at these structures from both the anterior and posterior in just a moment. And so on the distal end I have two condyles. Remember what a condyle is, smooth round projection. Uh-oh. Hold on everybody, just a little frozen screen. So, we’ll – we’ll do our stop share, start share a couple times so that we get this back up and running. We’ll try it again. I’m going to flip the camera off and back on. Hello. Good morning. There we go. Let me know if you’re seeing my hand waving like a magician over the top of the bone. Yes?

>> We definitely can see your hand.

>> Thank you. All right. And so we’re looking at the distal end again. Two condyles. Smooth round surfaces that we’re seeing here and here. And so when I take us back up, we’ve got the head, so everything on this side is medial. Everything on this side is medial. So, with my two condyles, one of the condyles, this is the medial condyle, looks kind of like a spool of thread. It’s this entire structure we’re seeing here. And that particular structure is called the trochlea. And so the trochlea is this smooth, round structure that looks like a spool of thread. And the other condyle is this rounded condyle called the capitulum, so it’s more rounded. Oh, look, there was a pin there. Must have been a test question. Capitulum, cap, head. It’s round like a head. So, there’s the capitulum. So, these two condyles, the trochlea, which is medial, the capitulum, which is lateral, have specific names that you need to know. Then, associated with the capitulum and trochlea are two what are called epi, meaning next to, condyles. And here’s where we need to know medial and lateral. One of them is called the medial epicondyle and the other is a lateral epicondyle. So, that means a projection near the condyles. I’m going to take you back up the bone again. Here’s the head, this is medial. Everything on that side is also medial. Here’s the trochlea. This extension, very obvious, is the medial epicondyle, next to the condyle called the trochlea. On the other side, not as obvious. A little – kind of little projection, teeny-tiny projection next to the capitulum lateral epicondyle. Lateral epicondyle. This is anterior and we’ll flip it posterior so we can see these from the other aspect. So, here they are posterior. And, again, what am I seeing? This very obvious projection, medial epicondyle next to the spool of thread shaped trochlea. These are medial. There’s that rounded, not as good a view of the – the capitulum posterior, and lateral epicondyle. I’m going to take you back up right – all I did was flip the bone over. Head, medial. Medial epicondyle, trochlea. Capitulum, kind of seeing just the distal-most edge of it here. And this little bump, the lateral epicondyle. But the other thing from this view that I need to know, and it’s very important, is this very deep indentation. Must be a fossa. And that’s the olecranon fossa. So, let’s write a couple things about it. The olecranon fossa, again, it’s posterior. And the word “olecranon” means elbow. Elbow. Put yourself in standard anatomical position. Where’s your elbow? It’s posterior. The olecranon fossa articulates with a structure called the olecranon, the elbow. I’m going to repeat all this. The olecranon is on a next bone that we will be discussing. Haven’t gotten to deltoid tuberosity yet. The olecranon is on the ulna, which is one of the bones in the forearm. So,

I'm going to repeat all of this, because it's all important. Here is the medial epicondyle. Here's the condyle called the trochlea, need to know it by name. The rounded lateral condyle is the capitulum. And this lesser projection here is the lateral epicondyle. On the posterior you're going to see this deep fossa called the olecranon fossa. And it is olecranon, meaning elbow, because it's going to articulate with a structure called the olecranon on the bone called the ulna. So, we're going to put all of that together in just a moment. And, again, it doesn't matter which way I'm looking at this. Again, this is posterior, put a little asterisk or highlight the olecranon fossa, because the olecranon fossa, along with the head, which is medial, are going to indicate for me if I'm looking at a right or a left bone. So, if I'm seeing the head and the olecranon fossa, this is a posterior view. Again, this is a left humerus. I'll lift it up again, show you a little bit more of the bone. And then [inaudible] the last structure, which you guys skipped over because we wanted to get through all of that distal end, is called the deltoid tuberosity. This is our first tuberosity. A tuberosity is a rough surface on a bone. It looks like somebody took sandpaper and rubbed it on the bone and roughened it up. The deltoid tuberosity on the humerus, if I can get close enough so you can see the rough edge of it, is on the proximal 1/3 of the shaft. And so this looks like – looks like I took some sandpaper and kind of rubbed it, rubbed it, rubbed it. That whole – that whole area, that whole rough edge is the deltoid tuberosity. I'm going to lift it up a bit more to show you where it is in relation to the head. Won't see the roughened aspects so well. A little bit. This proximal 1/3 of the shaft. And the reason that's there, again, that rough edge, the reason that's there is that I'm going to have a muscle attached there that's called the deltoid muscle. Muscle of the shoulder attaches on this position on the humerus. Right, this rough – right there, that's a good view, rough edge. Deltoid tuberosity. And that is proximal 1/3 and anterior on the bone. This is the anterior of the bone. How do I know? I don't see the olecranon fossa. There's a little teeny-tiny fossa there, but I'm looking for this deep fossa, the olecranon fossa to be posterior. Humerus, there's your left humerus. Left humerus, again, what are we looking at for an articulation? This is where these two bones articulate. I'm not doing it very well because they're laying flat, but this is how they articulate, scapula to humerus. Oh, that's why it was weird. Wrong one. Here we go. [inaudible] No, I had it right the first time. I had it right the first time. Scapula to humerus. Next on our list, we're looking at bones of the forearm. And the bones of the forearm are – we're turning the page, page 30. Bones of the forearm are called the ulna and radius. So, we're going to start with the ulna. I'll show them both to you, ulna and radius. Lift it up. Ulna and radius, bones of the forearm. We're going to start with the ulna. And let's write this, we wrote it down in the lecture, but let's say it again. The ulna is the medial bone in the forearm and the radius is the lateral bone in the forearm. Put yourself in standard anatomical position. The ulna is medial, it's sitting right next to your trunk, and the radius is lateral, it sits right over the thumb. Right over the thumb, the radius. So, we'll start with the ulna. And, again, we're going to get – this is the proximal to distal end. Proximal to distal end. Going to focus in on the proximal end of the

ulna, medial bone in the forearm. Oh, there – there it is. Olecranon process, elbow. The ulna has the elbow. I'm going to turn it sideways so you can see it. There it is, there's the elbow. So, this entire edge right here, this whole thing, turn it all the way around, is the olecranon or the olecranon process. Looks like your elbow, right? Shaped like your elbow. We'll articulate it with the humerus in just a second. So, proximal olecranon means elbow. Next on the list, trochlear notch. I've seen the word trochlear, too. The trochlea was the condyle that looks like a spool of thread at the distal end of the humerus. Notch is a large indentation. Here's the trochlear notch. What do you think is going to articulate there? Write it down. What structure on the humerus is going to articulate with the trochlear notch? Write it down. What structure on the humerus – yes. Everyone, what is going to articulate? Yes. Write it down, trochlear – wait, wait, I have two responses. I think there are more of you out there, thank you. I think there are more of you out there, thank you. Trochlea, trochlea, trochlea. Here's what I want you to start noticing, words that are similar or the same on two different bones is because they're going to articulate with each other there. Boom! Words that are the – that are similar or the same, that's where two bones are going to articulate. I love it. [inaudible] I'm going to show it to you in a second. Trochlear notch. Radial notch. Radial notch, I'm going to turn the bone like so. Let's write it down first. The radial notch is on the lateral – lateral aspect of the bone, just inferior to the trochlear notch. I'm going to say it again. Radial notch is on the lateral aspect of the bone, just inferior to the – so, here's the trochlear notch. This is that radial notch, this indentation right here. Almost looks like a fossa, right? We call it the radial notch. So, where is it again? It's on the lateral aspect of the bone and just – just distal to the trochlear notch. Oh, look, a little – look, it must have been a test question [inaudible]. Oh, okay, it's called the radial notch. Everyone, what bone articulates at the radial notch? Write it down. What bone articulates at the radial notch? Write it down, write it down, write it down! Thank you! Write it down everyone, everyone, everyone! Radial notch. Yeah, we've got this! Yes, yes! And I'm going to be specific with you. Write it down, not in your chat but on your notes, the head of the radius. We're going to look at it in a second. The head of the radius articulates at the radial notch. We're going to look at it in a second, let's finish all of our structures. Right, I'm going to move the bone, right, because this is my proximal end. Moving, moving, moving, moving, moving to the distal end. And this bone has a styloid, all right? It means needle-like, sharp, needle-like process. Styloid process. And so here is the styloid process on the distal end of the ulna. Styloid process. And, lastly – I don't know why they're in this order, I'm sorry. I need to make those changes. And then we're going back to the proximal end, I have one more. We've talked about them twice now, coronoid, coracoid, bird's-beak-like process. The bird's-beak-like coronoid process on the ulna is right here. It's at the inferior edge of the trochlear notch. So, here's the trochlear notch. And where it comes to a point at its inferior edge, that's the coronoid process. Bird's beak, yeah, it kind of looks like a bird's beak, bird's-beak-like. Here is what we're highlighting or asterisking to help us with right or left. The two structures

that would help us with right versus left on the ulna are the olecranon. The olecranon is always posterior, always posterior, it's the elbow. And the radial notch, because the radial notch is always lateral. Because the radius is always lateral. So, I'm actually going to turn this how would be sitting in your body right now. In your body it's sitting like this, right? If you put yourself in a standard anatomical position, right, this is – I'm going to lift it. This is the proximal end of the bone. It would sit in my forearm – sorry. Apparently, it's 9:07. It sits in my arm like so. Medial proximal end, here's the elbow. Here's the elbow, here's the olecranon. And the radial notch is right here, because the radial notch has to articulate with the radius, which is lateral. Love it, love it, love it! Okay. So, let's look at the radius. I'm going to turn it this way first, and then we'll place it [inaudible] radius. This is the head of the radius, so this is the proximal end, distal end. Proximal head, distal. Let's focus in on the proximal end. Name the structures, which we just did with the head. So, the head is this round structure and the neck is the indentation just distal to it; head, neck. And then I have a tuberosity, radial tuberosity. So, I make sure I remember what a tuberosity is - rough. The radial tuberosity is just distal to the neck on the radius, and I'm seeing this roughened edge. That's the radial tuberosity. Why is that there? I've got muscle that's going to attach to it, we're going to look at later. Head, neck, radial tuberosity. Lift. Our last structure is on the distal end. The radius also has a styloid process, a sharp point. And here's the styloid process on the radius. So, here's what we need to know about the right or left on the radius, how it would be determined. I'm going to turn it again now how it's in your body. I'll put it on my forearm again. This is how it sits in – in the body. So, it sits like this, sits like this. Lateral bone, and the styloid process is lateral. It sits right over the thumb, your thumb is always lateral. Your thumb is always latera. And look for the radial tuberosity. You're going to see it kind of sticking out here, to be pointed medially. If I – if you were in class, I'd have you look at the shape of the bone, but it's going to be impossible to do on a 2-dimensional page. So, we'll use the – excuse me, radial tuberosity, medial, styloid process, lateral, to position this bone. And, again, a left bone. How does it articulate? Radial notch, head of the radius. Boom! Love it, love it! Radius. All right, one last thing and we'll take a break. Hand, look it's a hand. So, here's what I need to know about the hand. I have three groups of bones. Here's my – by the way, here's my radius and ulna. And the carpals, the bones of the wrist, are adjacent to, just distal to, the radius and ulna. They all have names. We don't need to know them, we just need to know that these are called carpals. The other thing I would say to you is that where – as all of the other bones, we need to know them articulated or disarticulated. That is not true of the hand, we will only see the hand articulated. Carpals, next to meta the carpals, bones of the hand metacarpals. And then bones of the digits are called phalanges. Here's what we do need to know about the metacarpals and phalanges. First of all, they're numbered. They're numbered 1 through 5, with 1 being the thumb. One – here's my hand, 1, 2, 3, 4, 5; 1, 2, 3, 4, 5. So, I'd have to say, right, this is the left hand. What would I want to say about it? I'd have to say metacarpal number one, or first metacarpal, second

metacarpal, third metacarpal, fourth, fifth metacarpal. Phalanges, same thing, 1 through 5, but phalanges have three parts, three different bones. And the bone that is just distal to the metacarpals are the proximal phalanges, right? They – these are nearer the attachment point of the shoulder. The fingertips are the distal part of the phalanges, furthest from the shoulder. And in between the proximal and distal phalanges are middle phalanges. Proximal, middle, distal phalange. Proximal, middle, distal phalange. Proximal, middle, distal phalange. Say it with me, proximal, middle, distal phalange. The exception is the thumb. The thumb only has two phalanges, proximal and distal, no middle. Proximal, distal. So, what would I do when naming these bones? This is – this is the right [inaudible]. I'm not sure if I've asked you about right or left, it's hard to determine, again, 2-dimensionally. But I would expect you to say, first proximal phalange, second middle phalange, third distal phalange, fourth middle phalange, fifth proximal phalange. Those are the words you'd have to use in naming the phalanges. Yay, that's the upper appendage done. I am going to stop the recording and start a new recording for the lower appendage after a 10-minute break. Be back at 9:25, everybody, 9:25. See you soon. See you soon.