

FICS ICSC UE Assessment – Shoulder

Dr. Christine Foss: Welcome everybody, I have a ton of information here. We are going to do the shoulder first, and then we will move on to elbow, wrist, and hand.

I am Dr. Christine Foss, Education Chair for FICS. A little bit about myself is I have a master's degree in Sports Medicine. I am a Chiro, of course. I, also, am an athletic trainer. I've worked with Division One Sports. I worked at the University of Notre Dame. I have worked at the Olympic Training Camp multiple times, traveled with elite athletes, traveled with Team USA Track and Field. I own a very large multidisciplinary practice in New Jersey in the US where I work with physical therapists, acupuncturists, chiropractors, physical trainers, performance specialists in a center that I own and have developed for many years. It is kind of my passion.

My special interests are working with more difficult complex cases and trying to figure out how to get them back to playing sport to their optimal performance. So let us get rolling. I have a ton of information. I do have the chat open for some questions. So I like to keep the questions to the end if possible, but if you have a burning desire to ask a question if I can get it in, I absolutely will answer it. That is fine by me. I would like to make it a little more interactive. I will ask a couple of questions and have you jump in to see if you can answer, some things for me if I kind of post some quiz question-type questions out there.

I am very interested in the shoulder and find the shoulder fascinating. So many injuries in the shoulder are missed or mistreated. We are going to talk about that and we are going to kind of work through how to really develop an outstanding shoulder evaluation. That is what we are going to be doing in the Hands-on module. So today, you are going to get the basics of that shoulder assessment. Then, when you come to the Hands-on module, we will be putting everything into practice. We will develop for you a nice flowing shoulder exam that is super-elite and in-depth and you will not miss any injuries. You will be able to uncover a lot of the more difficult cases, too. So happy that we can get moving forward with this shoulder. Then as we move on, we will have Dr. Henry Pollard. He is going to do the elbow and hand and wrist which is the second half of this lecture.

Let us talk a little bit about the shoulder. Before we talk about any anatomy or any functional anatomy or any injury, we need to first go back to your anatomy class when you are in chiro school? And remember what structures are there. I want you to think of not only the structures, but I also want you to think of the layers of structures that are the most superficial structures. The next layer down to the next layer down, the deeper structures, and the deepest structures.

That is an easy way to kind of think of your injuries, and how you are assessing them, and how you are palpating for them.

But then, we also need to think of the functional anatomy? What are my prime movers during this particular athlete's sport? How is this athlete using that set of muscles, tendons, or ligaments differently than another athlete? Or what did they need That is different than somebody else? So putting all those things into play as we dive into the shoulder today, and understand it is a very complex, system and therefore, a very complex chain of events for injury.

You are going to begin your shoulder evaluation with an inspection. Please make sure you have your patients properly disrobe. If it is a female, a sports bra is fine or a bra if they are comfortable with that, and the male, like this. You want to see the contour of the muscle. What you really want to take notice of you really want to take notice of, is the differences. How are they using their body differently? Understand, if we are talking about somebody that is throwing a football quarterback, American football, or we are talking about a baseball thrower, understand that we are going to have more hypertrophy or a larger muscle group on that throwing side versus the other side. Sometimes, asymmetry is fitting for an athlete. We do not need to always fix that. We only need to fix the dysfunctional asymmetry.

If we look at this, specimen right here in front of us, we can notice some differences here. We can look at and kind of call to mind what we are looking at in symmetry of the pec muscles? Really Important that we take a look, and when we have a shoulder inspection, we are evaluating everything. There is a lot going on with this particular patient that we take notice of, but as you are staring at the front view, the anterior view, I want you to notice some differences here. I want you to notice how he is probably using this shoulder differently than this shoulder. Can you notice the contour differences from side to side? And I want you to notice how he is using this pec differently than that.

This is a partial pec rupture after healing. Here. That is why now, you can almost notice the gap here where the tear was versus here. Different contour. So again, as you dive into somebody's anatomy, they might not mention that to you, but you are going to notice that they are using that body differently from one side to the other. Or this is an old injury that maybe he did not report, was an old partial pec rupture. How was it healed or treated or not at all.

So, that inspection of the region is really important to dive into symmetry, scars. You know, we could see a scar here from his shoulder surgery. I see a scar there from his shoulder surgery. If you look down at his elbow, we are going to see a scar down here or his shoulder surgery. So, lots going on with him. That is going, you immediately know this is going to be a more complex case to look at because you are unpeeling a lot of abnormally.

Then, we are going to move into palpation. Now, I want you to look at this particular patient. If we are talking about inspection, a whole different set of rules. If we look at her, notice her left deltoid is used very differently than her right. Notice as chiropractors, we notice that there is a bit of rotation with an anterior shoulder on this side versus this side. Usually, when I see that, that speaks to shoulder instability. When you see somebody kind of leaning forward with that side, it means as they do things, they are leaning forward with that glenohumeral joint. So, there is not a lot of stability there. We want to go back and just consider these things.

Also, notice that the difference in the contour of the bicep. I am using a different bicep from side to side, and then, my sternocleidomastoid is more active on the left than right. All these things paint a picture as we look at that kinetic chain. I always known not only myopically look at one injury, but you need to be able to unpeel and open it up and look at it from the shoulder, from the neck, all the way down to the hand? You need to be able to understand how does that affects the gate and how does that affect the whole chain of events when this athlete goes to move and perform.

Then, we move on to the range of motion. I am going to walk through how I do an evaluation of the shoulder. It makes it easy over the years. I have developed this protocol and for me, it makes perfect sense. So what I basically do is I stand behind the patient. When I stand behind the patient, I could see, from my passive range of motion, most importantly, how they are using the glenohumeral joint and how that scapula thoracic motion is-is working. What is really important with the shoulder, is that you are looking at the scapulothoracic motion. I want you to first look at this patient with her range of motion, active range of motion here, arms. I have stood behind him. I just say, "Slowly bring your arms forward and up over your head and slowly bring your arms down."

Now, we talked about the symmetry differences in the front of her, and then we watch her raise her arms to the front and to the side. You are going to look at how does she use this glenohumeral joint differently from one side to the other. Right? We said that she was rolled forward on that right side, which we can still see here, but then watch how that affects how she uses her range of motion on her left shoulder. Right? Now, when your shoulders roll forward, there is a different range of motion. So, can you appreciate that this angle is different than that angle? All right.

So the other thing, too with a range of motion, we watched, Dr. Tim Ray talked a little bit about, you know, soft tissue and, adjustment of the extremities and motion palpation. He talks that the body will always treat quantity for quality. It always cheats that system. So the body is going to want a full range of motion. It will figure out how to get there. It is important for us to understand the quality of the motion, not only the degrees. In other words, do not only care that they get to 180 degrees. Did they get there well? Or did they get there like this? You know that does not count as 180 degrees for the shoulder. This is 180 degrees.

The order of events in what muscles are contracting to gain that motion, and how the glenohumeral joint is moving, and how the scapula thoracic joint is moving is very important when you are assessing a range of motion. It is just not the number that you get on the goniometer. I want to make sure we are really clear on that because that is really important.

So then, I stand behind the patient and I do abduction. Bring your arms side and touch your thumbs together over your head, just like this. Here, it is very important that we notice the scapulothoracic motion. Now, the scapular angle. Here. That scapula should not be rolling out to the side with abduction until a minimum of 30 to 60 degrees. So, until I get that arm to this angle, my scapula should still be in place, then it starts moving with my arm. That is why I stand behind the patient and look at that abduction because you will catch a lot of shoulder issues by just looking at that scapulothoracic motion. So let us just look at it one more time. When you are ready. So, we are just looking there. scapula's good. Now, the left comes off faster than the right. So this is not a scapulothoracic dyskinesia. This is pretty decent.

So let us move forward. Now, we are going to look at an abnormal so that we can, knowing what normal is, is what we learn in chiro school, but let us look at abnormal. So this is, you can see the medial border of the scapula is exposed as compared to here. The left is the abnormal side. The right is the normal side. This patient had, his, status post-surgical. He actually had a very large bony tumor on the inferior aspect of his humerus pre-surgery. That was removed, so for a very long time in his life, he was not able to have normal glenohumeral motion.

When I say normal motion, that says, you abduct your arm, the glenohumeral joint, the humerus drops and rolls. It needs to be able to drop. If it does this, this is when you get shoulder elevation. It is got a drop and roll. He was not able to get that and therefore, he had a lifetime of this scapulothoracic dyskinesia, which we see here. So, when we see this we are trained to think, you know, serratus anterior weakness. However, this could also be dorsal scapular nerve entrapment. That is in front of the Scalenus Medius, and that causes the levator scap and rhomboid weakness. So do not always just jump to the serratus, but what we do know is that they are scapulothoracic dyskinesia.

Let us watch and I want you to pay attention to how quickly his left scapula rolls with his arm as he raises his arm in abduction versus the right. We are going to see 2 ranges of motion on this one. Let us look at both. Your arms forward and bring it up over your head. So, already we can see a big difference from right to left. This is for, he is missing some flexion. He is missing about 20 degrees of flexion and the scapula just has no idea what to do. Then, in abduction, look at that scapula rolling off. There are no scapular stabilizers functioning, he cannot even have control of that scapula. It is just 0 control.

So we take somebody like that, we think about, you know, here it is again, rolling off and his glenohumeral joint. You see how he lifts this way. He does not drop that humerus inside the glenoid labrum. That is important to notice because that tells us there is a glenohumeral joint restriction there. When we get together in our Hands-on modules, we are going to be working on this type of shoulder raise and how we fix that, how we adjust that in our extremity lab. So that will be part of our Hands-on stuff.

So let us think outside the box, sometimes. We have these patients that he is been to through physical therapies, then through surgery, and he still is this way. He came to me after physical therapy was completed. He was not happy with how his shoulder was performing. He had a lot of weakness. More difficult patient, doctor. I like to work on tough cases. So, you have to think outside the box, you know. You have got to think different, you know. We cannot just keep doing the same treatment that failed on somebody over and over again. We want to think about is some muscle re-education.

This is Russian stim. I use Russian stim to re-educate the muscles, to gain that brain-to-body connection on how to move your arm. I want to start first with this one here. We put him in front of a mirror and I have a mirror in my office. I put a lot of patients in front of the mirror so that they can stare and reteach their brains how to go through that motion. I am trying, I have the Russian stim on contracting my lower scapular stabilizers while He is watching for normal glenohumeral motion. I have the mechanics, the stim doing the work. I just want normal motion first.

Your first step with treatment is gaining normal motion. That is number one. We have that bring-to-body connection at first and then we move forward. Once I get the brain-to-body connection, then I will move forward with more resistance. We have him on a wall with his hand up against the towel. This is a great lower scapular stabilizer serratus anterior activation exercise. When you see somebody with that wing of scapula, this is great. They push into the wall with their arm and their elbow all the way up, and then they push into the wall with their arm and the wrist all the way down. Then, so what we would do is we would have whenever the stim would come on, he would be raising his arm up. When the stim would shut off, he could lower his arm.

I have the stim on a cyclic process going on every 20 or 30 seconds and going off every 10 seconds. So again, each time it came on, they would contract the stabilizers and then he can just get that motion back and get that brain to body of that serratus anterior contracting. So just thinking about how we are going to think outside the box sometimes.

Then we think of our progression. We look at how are we going to, make a change. Here, he is several months later after working on him. That looks very different than the one I showed you previously. So let us watch his motion today. Let us watch his forward flexion first. Better. Still

needs a little more scapular stabilization, but He is better. He is got lower trap activating there. He is not using all upper traps to raise his shoulder, which is a huge factor with shoulders. We do not want all upper trap action.

Let us look at abduction which is the hardest one to get back from these times. They are good stabilization. Good stabilization. Good stabilization. And he just starts to lose it there. He is doing better. It is still not perfectly symmetrical. He is not all the way there yet, but he has definitely made some great forward motion in the time that we are having together in treatment. So here is his before and after. I thought I would put it side-by-side for you of where he is today. This was taken last week actually, and where he was the first day I treated him, so big difference.

I call that scapular repositioning and retraining. That is pretty easy to do in the clinic. I feel like nobody better than us. We know joints and that scapulothoracic junction is huge. Lots of scar tissue built up underneath the scapula for scapular mobilization. I do a lecture every year in the Cadaver Lab at the Chiropractic College in the area and I always go in and look under the scapula of the cadavers and just see that amount of fascial adhesions that stop that normal motion. So the mobility of that scapula is important as long as we do not get too much mobility.

So then, we are going to move forward with our shoulder assessment. We are going to be looking at a range of motion called Apley's test. Apley's test is how you can quickly assess a range of motion in all planes for the shoulder. So let us run this patient through Apley's test. So you touch your opposite shoulder. You put your hand over your head and you touch your opposite superior angle of the scapula. You bring your arm behind your back and touch the opposite inferior angle of the scapula. That is called Apley's test of the shoulder, and then we do that.

Here is her comparison side to side. So can you see how her right side was really missing? If you remember when we did our first inspection, we picked out that right side as being the problem side. We noticed the contour difference. We noticed her shoulder was coming forward. We talked about instability in the area. Now, we are seeing it prove itself on this Apley's test. We are seeing that she is a missing range of motion. She cannot get her hand back behind her back to touch the opposite side of her inferior board of the scapula. Positive Apley's test.

So then, we are going to move into manual muscle testing. Manual muscle testing. We have to really understand what we are testing. I want to run through all these, all these muscles here on our list. This is your tick-off box. We should be able to hit each of these muscles as we are evaluating them. I think that that way, we really have a great assessment of all the rotator cuff muscles, all the primary movers in the shoulder, all the secondary movers in the shoulder, and anything that could subsequently be injured with an upper extremity. We are going to go through that today and we are going to go through this whole evaluation.

First, we are going to talk about special tests of the shoulder. These special tests and how do we run through and assess our shoulders for rotator cuff injury versus tendonitis, old tear versus new, partial tear versus full tear. All very easy to do. Let us just jump right into it. We are going to first talk about our major kingpin of the shoulder, which most of your patients will be coming in with, and that is biceps tendinopathy. Biceps tendinopathy is, just inflammation of the tendon. Now, this is the biceps long head here.

Remember that it begins at the superior aspect of the glenoid labrum and travels down. This starting at the coracoid process coming down is the short head of the biceps. So, we have 2, 2 biceps tendons right here. Now, understand that, you know, this is more commonly the tendon that we see, tendinopathy in. We have to think about, how the patient presents, with that anterior shoulder pain, they are going to tell you, "It hurts here in the front." I choose there are most patients tell you where the pain is, how did it happen, you know, What is the occurrence.

We have to think about, the thing about tendinopathy is it loves to hide when you stop doing the activity, but comes right back again once you start. If you have the patient that says, "Listen, I took some time off, it felt great, and then as soon as I started, it came back again." Your warning bells should immediately be going off saying, "I think this is a tendon problem." So then, we need to go back in and assess the tendon. We need to think about, you know, this whole tendinopathy. How it occurs is by increasing load and intensity of an activity too fast, and that is why when we introduce an activity, it should be a slow, systematic increase of load and intensity so that the tendon can also hypertrophy and get used to that load.

So this is the patient. Let us talk about the Football Quarterback that goes out and throws a hundred throws the first day. The tendons going to be inflamed. As opposed to starting with 20 throws short, and then 30 throws short and 10 long, and then gradually getting the length of the throw longer, that way it is a harder throw and the frequency, how many throws per day. It is a very systematic and incremental increase on the tendon in order to let it respond and adapt, to the load.

We talked about tendinopathy in the shoulder and that is, you know, the biceps tendon is the most prone tendon in the shoulder. But, why is that? Why do you think it is most prone? I am going to ask and anybody jump into the chat, feel free to jump in and see if you have an answer for me as to why that is the most prone tendon in the shoulder to have tendinopathy. Anybody have any ideas? Anybody brave enough to answer? Impingement. Lack of stability. Oooh, I like that. Very nice. Very good. Anybody else? That is a good idea. It is involving very common motions. Okay, very good. All right. You do use the biceps tendon most times. We cannot think of getting through a day without using it. I think that is a great comment. All right.

So I want you to think about something. I want you to think about the structure of the bicep tendon and I want you to think about how it looks. I want you to-I want to jump forward here to this next screen. You know what? Let us just jump back 2 screens. I want you to think about something, and this goes with what both of you are saying. If you think about injuries in the shoulder, which is most commonly this area, this bicep, this subacromial area.

This supraspinatus is the most common, injured rotator cuff muscle in the shoulder. But what happens with everyday activity, lack of vessel? Okay, very good. Well, you guys were doing some reading on tendinopathy. But what happens if you can appreciate the shoulder and appreciate the glenohumeral joint which we are going to go back to.

We can appreciate that glenohumeral joint. I want you to really appreciate this bicipital groove here. We are going to come back to that in a little while. I want you to think about that. So I am going to leave you with that little bit of a cliff-hanger as we come back to this whole biceps tendon question.

We are going to jump in, and I want to ask you about this. Tell me what is going on with this one. Anybody have any ideas? Same patient. Right arm versus left arm. Let us start with this. Which one do you think is the injured arm?

Anybody want to say which one they think is the injured arm? Left. Good guess.

Anybody else? Armando's the only brave one to go out there. One left answer. Left. Left. Okay, everybody is agreeing on the left. I am going to tell you. It is the right, and that is why I have this up here. This is a proximal bicep tendon rupture.

This is what we call the Popeye sign. Popeye is a cartoon here in the States. I do not know if it is anywhere else. But what actually happens is the bicep tendon ruptures up here at the top, the tendon rolls down and makes it look like you have a bigger muscle than you have. That is what this is. So he really has his muscles rolled up to look like He is got a fake, big muscle when really this is the one that is normal. He had a previous shoulder surgery here from a different rotator cuff injury, but this is-this is chronic. This is chronic. So, this is about the year and a half after the injury. So That is going to be his permanent state. So He is always going to look like he has this great bicep on one side and not on the other side. Yeah. So That is called the positive Popeye Sign,

Now, if somebody ruptures the distal part of the bicep. It ruptures from down for the radial head. They are going to have a reverse Popeyes. In other words, the bicep is going to seem like it is super high and peaked very high. Notice how this is peaked lower. So there is Popeye Sign and reverse Popeyes. And how you look for a distal bicep tendon rupture is doing just the Hook Test. And you'll have the patient's arm bent here and you'll just hook your finger under the bicep tendon. If you can hook your finger on that bicep tendon, it is attached. When it is not attached,

there will be nothing to hook your finger under. These are all repay-real patients of mine in my office, by the way. All the ones I show in all my lectures.

So let us move into our rotator cuff assessment, I do not want to run out of time today. So let us look at the supraspinatus, infraspinatus, subscapularis, and teres. What we call the SITS muscles. And those SITS muscles are the ones most involved with internal-external rotation of the shoulder.

If we think about supraspinatus. Supraspinatus is the first 15 degrees of abduction. Right here. Most commonly injured rotator cuff muscle. The infraspinatus is an external rotator. Here. If you notice it on the inferior border of the scapula, the posterior aspect, underneath the scapular spine. I also want to mention with that, the teres minor as the other rotator cuff. A lot of times, the infraspinatus and teres minor are kinds of almost meld together on cadavers. So imagine that they are melded together. So they both are external rotators.

But the thing That is a little different about that teres minor, its job is holding that glenohumeral joint, the humerus, into the glenoid labrum. So, whereas the infraspinatus is more external rotation, the teres minor is a little external rotation, but being able to pull the shoulder joint approximated. So, the humerus into the glenoid labrum. So that is come up important, and then, the subscapularis is our great internal rotator. Just really understanding the difference between these muscles that way we can tease them. apart.

We are going to talk about that supraspinatus. The mechanism of injury, most commonly, is anything. A lot of times it is more repetitive stress. You can also have your acromion up here because that supraspinatus comes out right underneath. The acromion process. I am going to show you. So if you are looking at the acromion process here and we could see the supraspinatus coming out from underneath the acromion attaching to the superior aspect of the humerus. Most times, the tears, either evolves from here or tear here. Sometimes, they occur under the acromion. If someone has what we call a Type 3 acromion.

There are 3 types of the acromion. Acromion that sits straight. Here. Or a hook comes down a little bit at Type 2. Or a Type 3, comes down even more. Understand that Type 3, how it is going to scrape into that supraspinatus. We get a scraping sensation until it ruptures, and then very frequently people have spurs on that aspect of the acromion 2. That just keeps scraping the muscle on, until, over time, it ruptures. So it is like sometimes, I am not surprised by the patient that tells me, I had a patient that said, "I just picked up a bag of Chinese food, and all of a sudden I cannot lift my arm anymore." That is a supraspinatus. That is something over time. It just one more thing that breaks down the shoulder. That is the patient that cannot lift their arm away from their side. Right? There doing this to lift their arm? Think supraspinatus.

That is that first 15 degrees of abduction. We are going to test them. We are going to muscle test them in the abduction and we are going to do something called a full can and empty can strengthening, uh, manual muscle test. Here is the full can. 45 degrees forward into the side. And That is for our supraspinatus, and then we are going to then move on forward to full can to empty cans. So we just did the full-can, and then we are going to do the empty can. So again, here she is, full can. That is good and strong. That is a normal supraspinatus.

Then, we are going to have to do an empty can. We rotate the thumb towards the floor, hold again. So the difference in that. That is important to think about is when I do the empty can, when I roll my arm in, I am actually checking for a little bit of impingement in there as well. So how much inflammation is in there That is associated with the weakness or if they are strong in a full can and weak in an empty can, I probably have more impingement than a tear. We are starting to tease apart the differences in the shoulder and then how we really look at them.

We move on to the infraspinatus muscle. We talked about that before, and again, that is an external rotator. If we think about, the throwing athlete being able to get the arm back there, that is when they are using that infraspinatus muscle. So, again something over time, they are going to have more pain in the backside of this shoulder. That is what they are going to tell you their pain is here and it radiates down the arm. They are going to have a weakness as we manual muscle test external rotation. So, here is, let us go here. Let us test it. I always, want to say, start with the least invasive muscle test first before you go to the most invasive, and that is what this is showing.

When we test muscles first, particularly for the shoulder, I test them at their side first, and that is this left picture. Then, what I will do if that is normal and negative, then I am going to go ahead and tester in an, in an unstable position here. And the reason we are doing that is I can pick up a more normal injury that way. So start with a stable position and moving into an unstable position. So here is our stable position for external rotation. Then, here is our unstable position for external rotation. So again, down at her side and then up here. I usually bring it in a little bit and say "Meet my resistance. Push your wrist into my hand." Pretty simple.

The subscapularis as we talked about was our internal rotator. That is, you are releasing the muscle. You are throwing muscle, and by the way, as we are talking about the rotator cuff, it is really important for us to think about the throwing action. When we are talking about the shoulder, particularly. Understand that most injuries occurred in the rotator cuff from the release of the ball or when you are releasing. And the reason why that is because as you are releasing a ball, the eccentric force that holds that humerus into the glenoid labrthe brake system so to speak, to slow down your shoulder is working really hard. So, those breaks that are working hard to slow down your shoulder are What is frequently get injured. That is why we start seeing the infraspinatus injuries, the teres minors injuries. It is like slowing down the arm stuff.

The subscapularis different than that is our throwing one. That is where we get our internal rotation from a very large muscle here that comes out and attaches to the anterior aspect of the humerus and invests right prior to that biceps tendon. So when someone says they dent to your shoulder plane, also know, it might be a subscapularis tear too. We have to think about that. So melding your manual muscle test with your complaint area. So again, we are going to test internal rotation in a stable position. Then we are going to test internal rotation in an unstable position, Good.

We are going to go to that subscapularis, and that subscapularis, I am going to teach you some tricks now for the shoulder. This test here is a scapular lift off test. So the patient should be able to put their hand in their opposite back pocket and lift their hand away from their back. So try it as you are sitting here watching the class, I want you to take your arm and put it behind your back. I want you to lift your hand away from your back,

So let us watch this test. Let us see. Notice if you can do it from side to side on your shoulder. Notice how much she can lift it. She can lift it, but it is not as much. Now, look at the other side. Big difference. So going back to her on that regular static history and-and assessment of just musculoskeletal, we saw forward shoulder. We saw asymmetry. Now, we are starting to figure out What is going on. She probably had a partial subscapularis tear that was not healed well. As you can see, she could not lift, do that scapular lift off, on the one hand, a little bit. If she can do it a little bit, it tells me it is not completely ruptured. It tells me it is probably partially torn from an old injury. Let us look again. That compared to that, big difference.

look at the cheat on how to check our teres minor. This is that middle-aged female that has pain in their shoulder or maybe they had a repair and it re-ruptured, which is not uncommon. They are always , like, trying to lift and do things. Like do their hair like this or the shoulder lifts up. You can check the integrity of the teres minor by just having them sit like this. Let us do it with it as we are watching.

We talked about the teres minor. Its role in holding that humerus into the glenoid labrum with external rotation. When we cannot get the humerus into that glenoid labrum with external rotation, we have a teres minor problem. So let us look at how we are going to assess that. Here it is. There. She can so nicely keep her arm pinned against their side and externally rotate. Try it on both of your arms and you'll be able to see "Geez. Why? That is a little funky." You might have a teres minor problem on one side. these little cheats are nice to do in practice. Where you can quickly get to the answer.

We are going to move on to talk about the labrum, and I want to mention that the function of the glenoid labrum is the cartilage inside the glenohumeral joint. So, here it is right here in this

picture. This thin line. Lots to talk about labrum injuries with throwing athletes, they tend to tear. Why is that so significant? It is significant because the bicep tendon comes up here through the, into the glomerular group and attaches right onto the superior aspect of that labrum. So then, if there is a labral tear, every time you are using your bicep, you are pulling on that tear and potentially making that tear larger. We need to really think about that, and think about, "How do I circumvent that,?" "How do I get rid of that problem?" "What do I do about that?" So, we think about, making sure that we can, remove the bicep tendon.

Sometimes, surgically, they remove the bicep tendon from the subscapularis with the labrum and they reattach it down here. That was that surgical scar we saw on that patient earlier with the Popeye sign on his opposite arm. He had biceps tendinopathy where it was just disconnected here and reattached back down. But the function here is that this helps make that cup a little bit deeper into the glenoid labrum. Except for that humerus just has a little more stability to it. Not much, but a little more.

But we want to think about this labrum as a function of rotation, an interesting fact is that for like high-level pictures, we almost want them to have a labral tear when we assess them and send them off to the major leagues because with the labral tear there, as long as it is not painful or symptomatic, they have more external rotation. If they have more external rotation, what do they have as throwing athletes? They have more, more motion, more velocity. A bigger range of motion equals a bigger velocity. So if they have a labral tear that is not symptomatic, they will have more external rotation, therefore, they have like that trapeze where they have more motion, more time to get motion, and velocity on their throat. So interesting little factoid about labral tears there.

There are a couple of different types of labral tears. There is what we call a SLAP tear which means the labrum is torn. If we are looking straight at the glenoid labrum here, we are looking straight ahead. We took the humerus away and I am looking straight at it. Just like if you are looking at me like this. Right here. If it is between 10 o'clock and 2 o'clock, if the tear is up here, it is called the SLAP tear. Those SLAP tears are important because what is in this area. My bicep tendon is right here. So with a SLAP tear, we chance that bicep tendon pulling on it.

The second type of tear is a Bankart tear. Right here. The Bankart tears between 3 and 6 o'clock. It is more forward. Not as much affecting the biceps tendon, but still something that needs to be repaired. There are many different types of labral tears, but the SLAP tear and the Bankart tear are what we consider, you know, are major players there.

So, to test the labrum we do something called the Grind test. What we are going to think about doing is we are going to take that humerus and push it into the glenoid labrum as we are circumduction of the arm. So, here is how I do that test in the office. Right there. So we are just checking. They

are just going to say, you know, if it is a mild tear, they are going to be like, you know, "That feels weird. It bothers me," or if it is a big tear going to be like, "Wow, that really hurts." Again, it does not tell us if it is a SLAP tear or a Bankart tear unless you can really say when I am up here, it hurts, or when I am down here, it hurts. You can really tease that apart if you want to, but again, that compression just irritates that labrum. That is called your Grind test.

We go back and talk about subacromial impingement. It is a favourite thing of mine. You are going to see that it is in the literature, one of the two most common injuries in the whole human body along with all athletes, all age groups, athletes, and non-athletes. If there is any condition that you should know in the upper body at all, it should be a subacromial impingement or impingement syndrome of the shoulder. It is so common. The reason is there is many etiology. There are many reasons. We talked about impingement. I am really just using a generic term, meaning, that there is inflammation in the subacromial region that it-that are impinging on the structures underneath. So, they can be impinging on the supraspinatus which is here, on the biceps tendon which is here, on the subscapularis which is here, and then here is your infraspinatus and then you are teres.

If we are looking at the side view of the shoulder, we work from the front, and I always say, look it as a clock, from front to back. When you are looking at your MRIs, you learn the same way. Here is your rotator cuff. Subscapularis. Here is your biceps tendon. This is a side note. Supraspinatus. Infraspinatus. Teres. There are your SITS muscles. You can really appreciate from this view how they work, but you also can appreciate the inflammation that can accumulate in this very small, tunnel area that needs to provide a group of muscles in an area, particularly as people have a little inflammation there or, little tendon overload, or maybe a little osteoarthritis, there is just no room for inflammation.

So, the inflammation accumulates in the subacromial region and trickles like a waterfall down, you are ready? in inter- intertubercular groove creating biceps tendinopathy. Because we have to understand they are inflammatory molecules, which will then bathe inside that tendon sheath of the biceps tendon and it creates pseudo tendinopathy. The patient's going to have that front pain.

So answering the question, the cliff-hanger question we talked about earlier is a lot of biceps tendinopathy, you should be thinking about What is really going on with the shoulder. It is very rarely that biceps tendinopathy is not accompanied by something else. The newer research tells us that 90% of the cases have a rotator cuff tear. Ninety percent of the people with the biceps tendon-tendinopathy have a rotator cuff tear somewhere in their shoulder. When I see biceps tendinitis and say, "Oh, something else is going on. Let us go back and look." And again, think of the inflammation accumulating in the subacromial region and falling down this waterfall That is called the intertubercular groove, getting inside of that biceps tendon sheath, and just bathing

that tendon with inflammatory molecules creating that fake tendinopathy. So just something to tease your brain a little bit and understand that there is more going on.

So how do we test for subacromial impingement? How do we see What is going on with that shoulder? You know, how do I tease that part? And we are going to, this test here is a great test for subacromial impingement. We just take the arm and they are passive. They are relaxed. I am just going through internal rotation in 3 different planes. I am internally rotating them out here first because my most severe impingement is going to be positive for pain here. Right? And That is the subacromial impingement. Then, I am going to bring them here a little bit and go internal because I am starting to look to see is it just subacromial? You know, some closing down the subacromial region, so more mild inflammation. But then, I am going to bring her all the way here. When I bring her all the way here, I am looking at a cortical acromial impingement. Because you can have impingement in the subacromial area or the cortical acromial area. We need to treat those differently.

So, here is the eval right here. Internal rotation. Subacromial. More subacromial. Cortical acromial. You are going to treat things very differently. Because if she is sore here, I would go back and check that pec tendon and see if she has a hyper abduction syndrome or pet-pec tendinopathy which she does have also. Here is a nice close look at those structures of the shoulder. I love anatomy. I am an anatomy fiend, but I want you just again to appreciate how inflammation can just trickle down this waterfall right here bathing that tendon and inflammatory modulator.

We need to talk a minute about bursitis as we are getting ready to get towards the end of this lecture. Bursitis is usually something that occurs from too much friction in the area. We have inflammation, we have irritation, the function of the bursa is to decrease friction between a tendon and the bone most times. If the Bursa is inflamed, it means it is gotten larger from too much friction. So now, the Bursa itself causes more friction. It is like, it feeds the monster, so to speak. So, we should not have that much. It should prevent it and it should calm down, but it gets larger, now, it is the creator for more inflammation. The Bursa can either sit in the subacromial area here, they can extend down to the front area, this way. We can also get them extending under the AC joint as well.

Again, that cortical impingement we talked about before. How we did the rotation in front of the arm. I want you to appreciate the 3 structures attached to that coracoid process. Remember from your anatomy way back in early chiro school, we have your pec minor, your coracobrachialis, and your biceps short head. So, any tendinopathy, anything of those 3 areas, you are a throwing athlete or an athlete That is practicing a curveball That is coming across their body that pec tendon is going to cause that cortical acromial impingement. We are going to treat that very

differently than an impingement from maybe a supraspinatus tear. Two different ways to treat it.

This called the Dawbarn's Test. It is just basically where we palpate the front of the shoulder and we look for, you feel like this gel-filled sac. You'll feel it when it is inflamed. I stand behind the patient. I palpate both shoulders at the same time and that way I can really get a difference between What is normal and What is abnormal in the patient. But you are going to feel it right here in the front of the shoulder. That is called the Dawbarn's Test.

I want to talk for a minute about the acromioclavicular joint sprain. There are 3 grades. Great 1 through 3, We are going to look at the amount of separation. Here is your AC joint here. The junction between the clavicle and the acromion. I want you to appreciate how tiny that joint is. It is a pissed-off joint when it gets injured. Its causes a lot of pinks. There is not a lot of room for inflammation in there. So, we have to think about this is a patient that got hit on the clavicle or maybe they fell on an outstretched arm or somebody hid them from the front. That joint is going to be a sprain.

So let us just look a little bit further into it. There are 3 states' joint separation grades. Type 1, 2, and 3, or grade 1, 2, and 3, 3 being the worst. Understand that when we have an acromioclavicular injury, that is a shoulder separation, that is not a shoulder dislocation. A shoulder separation is when your AC joint is sprained.

We can have Type 1. It is just a stretch of the cortical clavicular ligament. That is this ligament up here. Type 2 is a tear of the cortical clavicular ligament. Type 3 is tears of the cortical clavicular ligament and the-the cortical clavicular ligament, the conoid and trapezoid portion, and the ligament up here as well. We have 3 ligaments that are torn. So, understand that acromioclavicular, cortical clavicular are very different.

Here is our cortical clavicular conoid portion, trapezoid portion, acromioclavicular joint. When you look at the patient with a sprain, What is going to happen is they are going to look like that. Acromion's sticking up. They will look like this, and you are going to be able to push down on the clavicle and they go about like, "Ooh that hurt." So, you just going to palpate their AC joint and you are going to push down. It'll feel springy. The further it is sticking up, tells you the grade. So we can appreciate the Grade 3 is going to stick up higher here. Then the Grade 1 is just going to be a little bump with some swelling on it.

Shoulder dislocation is where we actually lose the integrity of the glenohumeral joint. So, again, separation is the AC joint. Dislocation is the glenohumeral joint. So this if you can appreciate a shoulder dislocation, the greatest thing you are going to notice is this sharp drop-off. Where you are going to notice this acromion process sticking out because the humerus is drop-down.

Most common dislocation is an anterior dislocation where the humeral head comes forward. I have seen anterior. I have seen inferior. I have seen posterior, all on the field. But this is going to be the sharp drop-off is going to be what? You notice. Here is how it looks on X-ray. Here is the glenoid labrum here. We are going to have that just drop right down and out.

We will look at those a little bit more as we get into our, into our Hands-on module. We are going to be practicing on each other and looking for these discrepancies and looking for instability. We are going to have a lot of fun in class and looking forward to it.

Do not forget about your rehabilitation considerations because you might be the only person that this patient sees. And how are we going to get this patient better so that they can do obviously what they love, you can tell this patient loves what she does and That is working out in a gym. We need to be able to get them back to that place. That is our ultimate goal. Have them achieve optimal performance.

You know, we need to think about our process, which is to start with decreasing inflammation always. Then, making sure you achieve a passive range of motion with good quality. And then, an active range of motion with good quality. Then you begin your strength. You should not begin strength if they do not have a good range of motion. Because you are actually going to cement in the problem or cause the problem to last longer. What we need to think about is getting motion first, getting the glenohumeral joint to move, then strengthen. That is a super important concept before we start loading.

Again, we think about hands-on performance, and we need to tick off all these boxes, but we have to first start in a systematic process. Thinking about gradually increasing load and intensity of the tendon and the muscles in the area so that when they get better, they are not going to get injured again. That is the biggest thing, we want them to get better without getting injured again.

Talking about increasing sport-specific drills. We want to do this as early as you can. This is Jill Cook's work right here on tendon injury. She is, if you look at some of her research, it is really quite magnificent as far as tendon load and injury. So thinking about, starting with isometric work and working on strength, functional strength, speed, and like Plyo and stuff like that. Like Plyo push-ups and whatnot. That would be last.

Again, thinking intensity, volume, frequency. Gradually, building these things up. Gradually going up the stairs with each subsequent visit and making sure that we have a well-thought-out treatment plan and we are not just having them do Plyo push-ups the first day. They will just get re-injured again.

If it is an athlete, we need to cross-train with sports-specific drills. Thinking about what that athlete needs to do. So, if I have a baseball player throwing athlete, there is no sense, you know, me doing running, running drills. I have got to make sure that I incorporate internal-external rotation in the motion that they are going to need. So, I have to really think about what type of activities I can do to make sure that I over-develop those muscles. And understand to pass injuries change function. You might not always be able to fix that change of a function. You know, those past injuries might cause mechanical changes, or strength changes, or range of motion changes. So, when thinking about that, we need to think about is that now, the new normal? Can I correct that or should I not correct it? Sometimes, their new normal is What is working for them. So, making sure we are looking at What is functional and what is, making them great, and we do not want to unpeel that.

lastly, we want to make the functional change. We do not want just a static change in just have the joint, adjust the joint. We need a functional change. We need to strengthen the inhibited muscles and facilitate the inhibited chain. We need to think about lengthening the required muscles. Maybe we need to think about more stability. We talked at the beginning about our patient that was rotated this way. What do we need to do to get her back here to get that shoulder in the glenohumeral joint to protect it from getting re-injured because she will continue to get re-injured in this position. We have no muscles helping us here. So we have got to get her back, set that rotator cuff, can be more efficient.

This is the functional assessment. Think about looking at that whole kinetic chain. That is why I wanted to put this up because the shoulder and the upper extremity have a huge role in playing with glute contraction. Gluteal utilization. We do not see inferior scapular stabilizers working. Know for sure that you are going to have the lumbar posterior sling, the lumbosacral region and that whole posterior sling down to your glute max not functioning well, as well. So, you will need to take a look at that.

Thank you so much, everybody. I appreciate. Let me go back one. I appreciate you being here. I look forward to seeing you at the live sessions. I will be in Lausanne, and I will be in Madrid. I look forward to seeing both, all of you. I am going through some of these assessments and getting you all set on the upper extremity.

[END]