Management of the Hemiplegic Shoulder
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- [Fawn] Welcome everyone to Continued and occupationaltherapy.com. Our topic today is Management of the Hemiplegic Shoulder. Our presenter today is Christine Griffin. Christine has been an OT since 2000 and has practiced in inpatient rehabilitation, skilled nursing facilities, acute care and outpatient clinics, and is currently a clinical instructor for the Ohio State University OT Department. She is AOTA board certified in physical rehabilitation, an AOTA board certification reviewer, and recipient of the 2011 Ohio OT Association Model Practice Award in Physical Rehabilitation, 2014 HITE Symposium Award, and the 2017 Ohio OT Association Continuing Education Award. She's had extensive teaching experience in the OSU Medical System including OSU's Physical Medicine and Rehabilitation Residency Education Program. Furthermore, she has presented at multiple local, state, and national conferences. Welcome Christine, so happy to have you.

- [Christine] Thank you very much, and I'm happy to be here. So welcome everybody, it's good to talk with you today. Our topic is gonna be management of the hemiplegic shoulder, so this is specifically looking at when we work with people post-central nervous injury, so someone who's had a stroke or a brain injury, and we're working with, they have that hemiplegic side, how will we be able to address that hemiplegic shoulder? So what we're going to be addressing today, we're gonna be looking at to make sure that we are able to cite current evidence for treatment techniques, and we're really looking at the treatment techniques of E-Stim, or NMES, taping and pain management. Our next learning objective is gonna be that you're going to be able to state how to increase occupational performance of patients with hemiplegia through addressing underlying performance skills and motor skills. So how do we increase those underlying impairments to be able to help with improvement in occupational performance? And then our third learning outcome is going to be you'll be able to list four educational topics to be able to address with the patient and their caregivers because education is such a key piece to be able to manage recovery for the
hemiplegic shoulder, and for education and pain management. So those will be our learning outcomes for today.

So when we start to work with a patient with a shoulder, hemiplegic shoulder issues, when we start to work with that, surprisingly enough, the first area that we do not look at is the shoulder, we actually need to start where that biomechanical chain begins, so we need to start looking at what their trunk stability and their posture is, because that's where the biomechanical chain starts with. So when we start to work with our patient post-stroke or post-brain injury, we really need to make sure that we're looking at their posture and we're looking at the alignment of their trunk, because it really is the foundation of all head, neck, and limb movement because you have to remember, the patient has to be stable in that central area for those more distal joints of the shoulders to be able to have that optimal alignment. So you really got to think of like having your patient leaning over in a wheelchair and that entire upper trunk is going in one direction towards where they lean, they're not gonna have that optimal alignment or optimal function in their shoulder if they don't have that trunk alignment that we're looking for. So what we are hoping to achieve and what our goal is is that we want everything to line up from hip up to shoulder up to ear.

So the movements that we're looking for is that with the pelvis, we need to have anterior pelvic tilt, and along with that, we have a lumbar extension, thoracic extension, and then followed by cervical extension. You're going to know if your patient has upright posture and if they are in anterior pelvic tilt when we see the strong lumbar curve right back here, we know that they are in lumbar extension. If it has that flat back space, like there's no strong lumbar curve back in there, then we know they are in lumbar flexion, and then they're sitting in posterior pelvic tilt. So what we're really searching for is to have anterior pelvic tilt, followed by lumbar extension, and then followed by thoracic extension, which leads then to cervical extension, so we have everything lined up. It’s a combined dynamic movement, so it’s not strictly that anterior
posterior plane, we’re also looking for being able to lean laterally and to not have any trunk rotation as well. So when we have that, when we’re looking for that ultimate upright posture, the pelvic position really dictates where that trunk is going to sit and how well it’s going to be able to have that optimal shoulder function later on.

What we’re hoping to get is that we’re hoping to get co-contraction of those muscles that help maintain the pelvis in the position that it needs to be in, and be able to help maintain that lumbar extension and that thoracic extension. So we’re looking for a co-contraction of muscles in between the abdominals, anterior abdominal muscles and the lumbar extension to be able to push them up into the lumbar and thoracic extension. We’re also looking for the right and left lateral abdominals to be able to hold them into upright posture so they’re not having rotation or to lean towards one direction. Now keep in mind that as someone moves through space and they move in and out of their base of support, when we do that dynamic sitting balance, that changes our base of support, and as we move, there is a higher challenge when we have an eccentric contraction as opposed to a concentric contraction. So if someone is really leaning towards that one side and has that eccentric side, that’s gonna be that higher challenge, and so that’s what’s gonna cause that dissociation so we can reach out of base of support, but keep in mind if they’re going towards that hemi side and that is at eccentric challenge, it’s gonna be very, it’s gonna be a higher challenge for them, it’s gonna put a lot more effort into it, and we’re gonna have that possibility that they could have that lean and that fall that direction, so just be aware, when we’re having that lean and having that challenge that that eccentric is gonna really force that higher muscle challenge that’s gonna be going on.

You really have to think of like the pelvic position as like where it’s going to dictate where that is going to be, so you really have to think of a pelvis as a basket, that as you change that base of support, the more tilt that you have in any direction is going to determine where that trunk is going to lean, so you have to have more stability
whenever you shift, and you have to have more stability whenever you get out of that base of support. So here we have an example of what malalignment looks like, or alignment, so right over here we have what our typical patient looks like, so we have our patient that’s gonna sit in posterior pelvic tilt, that’s gonna have a lumbar flexion and thoracic flexion. That’s gonna be followed by low cervical flexion and high cervical hyperextension. And then it’s also a common thing that we see is that we see that we have their pelvis sitting flat on the surface that they’re sitting on, but then they tend to lean towards their hemi side, so then we have these shoulders that lean down that direction, and we have a collapsed trunk on one side as compared to the other. What we’re ultimately looking for is over here on the right side, we’re looking for pelvis and that hip to be lined up with shoulder, to be lined up with ear, that’s what we’re searching for, and that we’re searching also for the pelvis to be in the same line that we have for the shoulders.

So this is an example over here of where we have that flat back space, so someone that’s not sitting in anterior pelvic tilt, they’re gonna have lumbar flexion. So we know when someone is in anterior pelvic tilt, we’re gonna have that strong lumbar curve over here that they’re sitting upright. So a lot of difficulty happens is that when we think that our patients are doing fine with their static sit, so we get them up on to the edge of the bed, or up onto the edge of the mat, and then they sit up on the edge of the bed and they’re holding static sits, and they’re up there and they’re not leaning, they’re not falling over, and we think hey, their static sitting balance is really good, so we can move on to other things, but what’s going on is that they are sitting in this position right here, and what’s going on is that they’re sitting on top of their joints and they’re really not having a lot of active muscle activity that’s really forcing them to sit upright and they’re not in that optimal alignment. So no, we’re not quite ready to move on just yet because they’re sitting in this position right over here and they’re maintaining their static sit, we have to make sure that they are in this position right over here. They’re to have this optimal alignment of sitting upright so that we can have that optimal alignment.
biomechanical lineup and that biomechanical chain that has that established for them. We also have an issue of patients sit in this position for too long, then there is a high association with pneumonia simply because they don’t have the capacity for their lungs to be able to expand or for the diaphragm to be able to go up or down.

There’s also a high association when patients sit in this position for too long that then they have at higher association with dysphagia, because once it changes the position of the jaw and of the tongue within their mouth. When they sit in that low cervical flexion and high cervical hyperextension ‘cause they go into high cervical hyperextension so they can see what’s going on, then it changes the position of the jaw and the tongue within their mouth, and they have a harder difficulty being able to manipulate food within their mouth and be able to swallow safely. And so it's really difficult just to be able to have that manipulation and have that correct chew. So not only does the sitting upright have an influence on how well someone can move their hips and their shoulders, but it also makes a difference medically on how well they’re able to have lung capacity so that they can have that decreased occurrence of pneumonia but then also increase the ability for them to be able to swallow safely, so it has a lot of effects on what happens. So upright posture makes a big difference for our patients as they’re going through neurorecovery. So why do we worry so much about upright posture and how that influences how the shoulder performs? Well what happens is that we have a chain reaction that occurs.

So if someone sits in flexed forward posture, it’s a chain of events that occurs, so what happens is that we have posterior pelvic tilt because there's slouch and they're flexed forward, that causes lumbar flexion and thoracic flexion, the scapula are going to abduct away from the spine, and the humeral heads are going to internally rotate, and that causes issues when they try to do shoulder flexion because that humeral head is not gonna be able to go past, with the greater tuberosity, it’s not gonna be able to clear that acromion, it makes it harder for shoulder elevation. If they sit into upright
posture, so then we have anterior pelvic tilt followed by lumbar extension and thoracic extension, the scapula adduct towards the spine, and the humeral heads externally rotate, and that allows for that greater tuberosity to have that clearance past the acromion when they go into shoulder flexion. So it really has a big effect on how well those shoulders can move. It also not only has an influence on the capacity to be able to move, but then also a physics thing as well. When they are flexed forward, it actually, from a physics component creates a heavier load, and then it’s harder to be able to elevate and lift up those arms. If someone sits upright, you shorten up that lever, and that’s an easier load to be able to lift and to be able to raise their arms.

So posture makes a big difference if someone’s going through their recovery and trying to be able to help with that shoulder recovery and shoulder movement. So here we have a case study, this is one of my former patients, and so we’re gonna look at his upright posture. And so what’s going on here is we’re gonna look at his back, and he is staying in posterior pelvic tilt because you can see he is in lumbar flexion right here, so he does not have lumbar extension, he is staying in lumbar flexion. So that means with that flat back space, that means he’s in posterior pelvic tilt, lumbar flexion, thoracic flexion, and then he is in low cervical flexion, high cervical hyperextension ‘cause he’s looking out to see the world. And so this is the typical patient posture that we have, and so what do we do about this, how do we be able to correct this?

So first things that we do when we’re starting to work with our patient that sits in this typical posture, we want to stretch them into the opposite direction so that they can achieve upright posture. So first thing that we do, we’re gonna stretch them into trunk extension, and to lumbar and thoracic extension. So we’re gonna bring over a wedge, a very large wedge, and we’re gonna have them lay supine on this, and we’re gonna put two towel rolls behind their back in an inverted T position. It’s easier to see the picture to be able to describe this is to actually look at the description, so this is what it is is that there are two towels rolls, one is gonna go right along lumbar curve, and the
other one is gonna go right along the spine. And the reason for that is that when they lay back, those scapula are going to wrap around it, are gonna adduct around, and that's gonna open up the chest and stretch out those pecs, and really force forward lumbar extension and thoracic extension. So once you have those towel rolls placed, you're gonna have them lean back onto the wedge to be able to stretch out their back.

Now the person in this picture, I had him bring his hands across his chest just so that you can see where those towel rolls are at, but I actually have my patients lay with their arms down to their side to be able to open up their chest more and to be able to have that really good thoracic extension stretch and to be able to open up their chest on the front side, so I have them lay their hands on either side of the mat. Patients find this stretch very, very comfortable because normally, they've sat in a hospital bed which is a soft air mattress, and so they don't really get a chance to be able to extend back, and then they sit, when they get up into a wheelchair, it typically has a sling seat and a sling back and that forces them into flexion, so they normally don't get to be able to get into that extended posture. So a majority of patients find this stretch very, very comfortable. The only patients that do not find this comfortable are patients with spinal stenosis, 'cause that spine is not gonna give, so that would be the only contraindication is that when one has some type of spinal stenosis where they're just not going to get that lumbar or that thoracic extension.

Typically when I start to work out, work with a patient and have them go into this position, I normally have them go for a very long stretch at the beginning, or session the first time that they do this, probably about 10, 15 minutes long. I'm doing other things during that session, I'm working on cognition, establishing rapport, asking them different questions about their home set up, doing range of motion, so we're doing things during that amount of time, but they're just really getting that long stretch. And then the subsequent sessions after that, usually about the first five minutes of each session, we're really working on stretching to be able to get lumbar extension. Okay,
so once we go into this stretch, so we’ve done this stretch, that is for them to be able to achieve upright posture, now we want to work on strengthening so that they can maintain that.

One of the best ways to be able to do that is to work on dynamic trunk control, and what I’ve found is that being able to shift in and out of their base of support is really one of the best strengthening activities that they can do. So what I have my patients do is that when I was starting to work on that dynamic trunk control, I was having them reach outside of their base of support, but what I’ve found is that because the body tries to find as much stability as it can whenever there is instability, my patients were almost immediately going into forward flexion as soon as they reach outside of their base of support. So what I do is I just take hands out of the picture, I have them hold their heavy hand to their chest, and I have them lean in all four directions, and what this does is this really works on that strengthening of that trunk, and so it really focuses on those specific muscles right above the pelvis that work on that posture, so it really focuses on lumbar flexion, lumbar extension and the laterals. So we really get a very good strengthening of how they’re able to perform dynamic trunk control and get really good strengthening of those muscles that really dictate their posture. So once I work on dynamic trunk control, and they’re able to maintain their upright posture for about one to two minutes, then I start to work on taping for posture.

So there are two different types of tape that are out on the market right now. There is Kinesio Tape, which is a very light and flexible tape, it has a lot of different amount of tension to the tape, it has a lot of pliability to it, and there’s also McConnell Tape or Leukotape. This type of tape is very, very rigid. It needs two layers of tape to this because the Leukotape itself or the McConnell Tape itself is very, very tough stuff. I jokingly call it duct tape for the human body because it’s just such thick tape, it has no give to it. And if you would put that tape directly onto skin, it would tear skin, so you need to make sure that you put on a protective layer first, and that protective layer is
called cover roll stretch, and what it is is that that protective layer is just a thin cotton layer tape that you place on the skin, and then you put McConnell Tape or the Leukotape on top of that. When you put that tape on, it has a very consistent amount of tension on the tape, it’s not a lot of pliability at all, it actually has no pliability to it, and so it has a lot of tension that really holds that posture into place.

For the patients that I work with for taping for posture, I tend to migrate more towards Leukotape or McConnell Tape as compared to Kinesio Tape just because it has that higher tension to it and be able to hold them into upright posture. So I have an example of how I do taping for that, so all right, so let’s go to the video that I have for that taping, and I’m gonna show you how I then tape for posture for this particular person, or for this particular case. So here we are, so we want to make sure that he's gonna sit in upright posture first, so I get them into upright posture. And you gotta remember on how tape works, it is not going to force someone into any position, it is a reminder of what position that they need to be in. So you need to be able to achieve the position first before you tape them, so that’s why they have to be able to sit upright for about one to two minutes before you tape them. So what I’m doing here is that I’m putting on the protective layer of tape, so this is the cover roll stretch, and they’re going to hook one side of the tape, right above the spine of the scapula, and you’re going to the opposite hip. It’s ultimately gonna look like a big X across their back, and you’ll see the final picture of this later on in the presentation so that you know what this will look like, but what’s gonna happen is that we’re gonna end up taping so that the pull, so it’s gonna retract their scapula, so it’s gonna force him into an upright posture and really force that lumbar extension and thoracic extension.

Now when you put on the cover roll stretch, that protective layer, you want to make sure that there is few wrinkles as possible in that tape because what's gonna happen when the Leukotape or the McConnell Tape go on, it’s actually going to cause wrinkles ‘cause it’s shortening that distance, so you don’t want wrinkle on top of wrinkle, so
that's why you want to have this as flat as you possibly can. So here comes the actual mover, the Leukotape or the McConnell Tape. What’s on is just a protective layer, it doesn't have any attention to it, it's not forcing any direction, but this one causes the position that you're looking for. So I'm gonna anchor the tape right above the spine of the scapula, and we're gonna have our person sit upright. And then we're going towards the opposite hip. And you can see how we're already starting to get some wrinkles in there, and that top layer caused those wrinkles, so that's why we don't want to have any wrinkles in that first layer, we won't have wrinkle on top of wrinkle. And you can also already see the difference in between the scapular position that this one already has a more retracted position as compared to the one that has not been taped. I tend to tape the non-hemi side first whenever I am taping for posture. There is no science behind that, what I have just found is a general trend is that there tends to be a little bit more stability for the hemi side when I tape the non-hemi side first.

Okay, here goes it for the other side, so exact same thing, you're gonna anchor right above the spine of the scapula, and then tape for upright posture. There we go, it’s really forcing him into thoracic and lumbar extension. There we go. So when I do taping for posture, I usually, this tape will last as long as the adhesive does, so normally about two to three days is how long that lasts, but you have to remember on how tape works, it's a reminder of what position that they need to be in, so it's not staples, it's not super glue, it's gonna kind of hold them in place. It's a reminder, so as that tape wears down and gets looser, they're actually gonna start to break in and out of that position, and when that tape comes off, typically after the first time that you tape them, the patient's actually pretty happy that that tape is off because then they can go back into flexion, because it's not forcing them to be in any certain direction. And so typically once you tape them, it's not gonna be very effective if you only do one round of tape, you need to tape them for about two to three rounds, so that means they're gonna be taped for about a week and a half or so to be able to really get that reinforcement of what position that they need to be in to be able to sit upright. And so
that's a really good way just to get that reinforcement so that they can be able to do that. Okay, so let's go back to our slides, and then we'll go on to talking about anatomy.

Okay, so now that we are, okay, so we talked our way through posture, so now we're actually gonna start to talk about the shoulder itself. So when we start to look at the shoulder, there are very specific key anatomy landmarks that we need to be aware of. So when we look at the shoulder and the joints and the articulation, so we have the glenohumeral joint, so this is where the humeral head comes up into the glenoid fossa, this is a very dynamic joint, it has a lot of movement to it. It's an inverse joint, the actual, if you think of like a ball-and-socket of like a socket being larger and the ball going into it, but it's actually an inverse, the ball is actually larger than the socket itself. There's only, it's an inverse joint, you have really have to think of like a golf ball with a golf tee as the concept of what is going on here, and the contact space is not very big, it's only about the size of a quarter. For the scapulothoracic joint, it is not a true joint, but we do have to watch it for biomechanical purposes because the scapula is the foundation of the biomechanics of the upper limb, so we really have to be aware of where that scapula sits, so the scapulothoracic joint is just where the scapula sits on that ribcage and where it sits on the thorax. The acromioclavicular joint, so that is right where the clavicle comes out onto the distal point right up onto the acromion out on the distal side or by the shoulder, and then the proximal end of the clavicle right up at the sternoclavicular joint, this is where it comes up and attaches to the sternum.

Now, either side of the clavicle, the AC joint and the sternoclavicular joint, both are very small joints, they're only about the size of a dime, and they're also fibrous joints. So arthritis is going to sit in there pretty quickly, and so if patients have pinpoint pain, they're gonna point right at that, and that's probably what's going on, so they have that fibrous joint pain. What's really important to understand about the sternoclavicular joint is that it's the only bony attachment for the entire upper limb to the axial skeleton, that
teeny tiny little dime-sized joint is where the entire upper limb attaches. So it’s really important to understand that because humans are bipedal, we are designed to have our arms move around up in the air and to be able to dynamically reach for things, that means that we have a lot of mobility within our shoulders, but there is very low articulation and low stability from a skeletal perspective. There’s really not a lot of contact space that really holds that axial skeleton together. So the joint really relies on muscle strength for stability to be able to have that joint be able to move in the direction that it needs to go to.

So if someone has a neurological event like a stroke or like a brain injury, that neurological message is going to change, and that muscle is not gonna be able to create the stability that it needs. So that’s why post-neurological injury, it takes so much longer for the upper limb to recover than it does for the lower limb because we’re really depending on all that soft tissue to be able to have that stability, and when you have that neurological change of message from the brain, that doesn’t allow that stability to happen, it changes the entire complex. So whenever my patients ask me, “Why is it taking so much longer for my arm to recover ” than it does for my leg?” Well, it’s just biomechanically how we’re designed and how that the stability is, it just, it’s going to take longer post-neurological injury. So when we look at our key landmarks for the shoulder, so on the scapula, we are looking for where the acromion is, and where the route of the spine and the inferior angle is, those three key points. And on the humerus, we’re looking for where the humeral head is, and these are all bony prominences that you can feel. We have to keep in mind that the scapula has a concave/convex relationship with the ribcage, so that is a curved surface sitting on top of a curved surface, so the scapula is going to tip and tilt and wing really easy just because we have that dynamic area, so that muscle balance is gonna pull it up into which direction that it needs to go into, so we have a really dynamic joint that happens there.
So when we are looking for optimal alignment, we are looking for to make sure that we have the acromion higher than the root of the spine, so that acromion is gonna sit, where'd it go? Here we are. There we go, so the acromion is gonna be higher than the root of the spine of the scapula, so the root of the spine is down here, and the inferior angle is gonna be up against the ribcage. Now a lot of times post-neurological injury, our patients are gonna struggle with actively going to be able to achieve that on their own, so the therapist is probably going to have to approximate the shoulder for them to be able to get them into alignment. So what the therapist is gonna have to do, they're gonna have to place their hands, one hand on the, one hand onto the scapula and one hand onto the humeral head to be able to glide it along the ribcage and be able to get it into position, but you want to make sure that you're doing both at the same time, you don't want to pull on the scap and shove on the humeral head, 'cause that's gonna be really uncomfortable for your patient you want to make sure that you're rotating both together within your hands. I had a colleague that called it rotate the globe, like you think like you have something round in between your hands, like a globe, a volleyball, a beach ball, and you're gonna rotate them both in the same direction at the same rate.

So I have some video of this to show, so let's go to the video, and we can show an example of what this looks like when we're doing that approximation. So we want to make sure that we're in upright posture first, and then back hand's gonna go onto the scapula and the front hand's gonna go on the humeral head, and we're just gonna glide that whole complex right along the ribcage so we have that rotation. You can see how both of my hands move in the same direction. one didn't pull first and then the second one, they both went in the same direction. And I have another video that shows when we're checking for our bony prominences. So we have our upright posture, so front hand's gonna go on humeral head, back hand is gonna go on the scapula, and we're gonna rotate that right along the ribcage and we're gonna check our bony prominences. There is the acromion, there's the root of the spine, and there is the
inferior angle, and they're up against the ribcage. So we know they’re in
approximation, and that's the position that we need to be in. Okay, so let’s go back to
the slides. Okay, so we showed how to do approximation, so the patient struggles
actively getting to do that, being able to do that on their own.

Okay, so while we're talking about the shoulders, it's a good time to talk about what a
shoulder subluxation is. So this is something that you'll probably see on
post-neurological injury, and the shoulder subluxation is a palpable gap in between the
acromion and the humeral head, there's a separation in that space. It's really, really
important to understand that a subluxation will occur within the acute hypotonic phase
of hemiplegia. So it can occur anywhere within a few hours post-stroke is how quickly
that can appear, and when I had worked in acute care and one of my colleagues had to
work, I've had to work in acute care, we've all seen or I've heard others say that we'll
see a patient within the first 24 hours post-stroke or first couple of hours post-stroke,
and that subluxation will already be there. So it usually happens in that acute early
phase, hypotonic phase. You know that they are in no longer risk for a subluxation to
occur when they are outside of that hypotonic phase. So you can do Ashworth testing
for spasticity anywhere in their upper limb, and if they are starting to show anything
above a zero, meaning that they are no longer hypotonic, they're starting to have some
spasticity, then they are no longer at risk for that subluxation to occur. Now, can a
subluxation get worse, can it have damage? Yes, but will it occur outside of that
hypotonic window? No, it won’t. There's a couple different theories on why the
subluxation occurs?

So then we've had a couple people do some science and look into this, our first theory
is that is it going to occur due to prolonged downward pull by gravity, which the
hypotonic muscles can't offer, have little resistance and can't be able to keep the
humeral head into place? And it really gives that over-stretching of the humeral
capsule, especially that superior aspect and the hypotonic supraspinatus. And that
supraspinatus is the key muscle that really holds the humeral head into place. Our second theory is that it’s a combination of flaccid muscular support that because of a downward tip, so this is kind of like a chain reaction theory, that because we have a downward rotated scapula, then that kind of spills everything out of the humeral head and then we have an inferior subluxation. There have been a series of studies that have been done that have looked at the subluxation and looked at the positioning of the scapula, and what they found is that through these studies is that they did, they measured the angle of the scapula that was in downward or upward rotation and they measured it by an inclinometer, it’s a style of goniometer that measures the angle of what tilt the scapula, the spine of the scapula is at. And what they found is that the scapular position was not an important factor and it was unrelated to the occurrence of an inferior sublux in hemiplegia, so it’s not a result of a downward tipped scapula.

So that means that, so that was proving that our second theory is not correct, so then we are left with our first theory that because of downward pull of gravity, the muscles are just not holding a humeral head in place. Now keep in mind the scapula does have an influence and active range of motion because that is the biomechanical foundation of the entire upper limb. So just because the series of studies said it was not a result of downward, the downward scapular rotation didn’t cause a subluxation, it is very much so important for active range of motion because that scapula is the foundation of the upper limb biomechanically, so keep it, it’s a really, really important joint, so please don’t disregard it, but we know that we had our first theory that is for because of downward pull by gravity. There is one of the most important things that you need to understand about a subluxation, and this is really, really important is that a subluxation is a result of weak rotator cuff muscles, and that’s a really important key thing to keep in mind for a couple different reasons. So we have to know that the primary function of the rotator cuff is to seat the humeral head into the glenoid fossa, that is its job to keep that humeral head into place. When we remember anatomy for the shoulder and for
what muscular layers that there are, there's an internal layer of muscle and an external layer of muscle. The internal layer of muscle to the shoulder is the rotator cuff, and the external layer of muscle is like the deltoid and the upper trap and the muscles that go around the scapula.

When we start to talk about intervention and treatment for the subluxation, we really have to make sure that we're getting down to the key thing that causes that subluxation, which is the rotator cuff because some treatment methods focus on the rotator cuff and some really focus on that external layer of the deltoid or the upper trap, so we want to make sure when we're doing intervention that we're getting to the root of the cause of the issue and we're strengthening that internal layer of muscle, that rotator cuff. And we'll talk more about that pretty soon, but I really wanted to make sure that you understood that the subluxation, the cause of that is weak rotator cuff muscles, that's what causes that humeral head to come out of place. There are different subluxation patterns, so there are different directions that this goes. So there is the inferior subluxation, that is when the humeral head comes directly straight down. This one is not painful on its own, but it's set up for high pain, just because there's a lot of laxity and flexibility that happens within that and there's a lot of movement, and so we can have a high set up of pain when it goes directly inferior. There's also when the humeral head goes directly anterior, and so it slides forward. This one is very painful because what happens is that the biceps tendon goes right across the front of the humeral head and this one gets pretty painful pretty quickly because biceps tendonitis is going to occur just because we're right up against that humeral head there.

So if the patient ever points directly right at the front of their humeral head and says, "It hurts right there," they've got an anterior subluxation and they have biceps tendonitis that has occurred. There is also a superior subluxation, and that is when someone starts to get a return motion in their arm, but the deltoid kicks in first before the rotator cuff muscles do, and so when they start to have that deltoid coming first, then that
shoulder starts to go into abduction and they’re bringing their arm out every time. So then what happens is that every time that they’re abducting and that deltoid kicks in first is every time that they abduct, that humeral head slides out, and then it impinges up against that supraspinatus every time that that humeral head rams into the acromion, so this one is really painful. The first couple of times that the patient’s gonna abduct and do that direction and have that ram, it might not necessarily hurt the first one or two times, and maybe not the first three or four times, but once we start to get into five, six, 10 times, then they’ve got a lot of impingement and then they’re gonna start to have pain that forms in there, and so that's gonna cause a lot of irritation and a lot of pain.

So this is when they just start to reach overhead too early and it starts to, it's that jamming up into the acromion through that humeral head. The best way to be able to assess for subluxation clinically is to palpate the subacromial space with your fingers, to be able to measure it with finger width. There’s been a lot of studies that have looked into ways to be able to measure of that subluxation space. They've looked into just using a measuring tape, using calipers to be able to measure the distance in ultrasound, but what they found the most reliable way amongst clinicians is surprisingly enough to be able to do with finger width, and they did a very well-designed study and they looked at many people's different sized hands, and what they found is that clinicians very accurately know exactly where to place their fingers on top of the, that first finger on top of the acromion, and then be able to measure that distance with finger width, so we can use it as a clinical methods to be able to measure finger width for that separation of subluxation, and it has excellent inter-rater reliability, doesn’t matter if it's very large hands or dainty fingers, you’re gonna get the same accuracy and inter-rater reliability, so it's a very accurate method. So feel confident in knowing that you’re measuring a subluxation correctly with a finger width.
Okay, so now we're gonna start to talk about the shoulder itself and prevention of pain and complications so when we do that, we have to look at normal biomechanics first. So when we elevate our arm up into the air, we have scapulohumeral rhythm, meaning that every time we elevate our arm up into the air, we have the scapula and the humerus are gonna move together in a two-to-one ratio. So every time we elevate up our arm, so every time it goes up into the air, every time we move our arm up through the air, then we're gonna have that scapula that follows along with it, and we have two parts of humeral movement to one part of scapular movement. Now that's not consistent all the way through the full arc, but if we want to generalize, we're gonna say two-to-one ratio. And so we have higher motion in the humerus than we do within the scapula, and that's how we move normally.

Now what happens if we have abnormal scapulohumeral rhythm, meaning the two are not acting together? Well then what happens then is that we have a lot of set up for issues that happen if we're not actively moving very clearly, so what happens, and I have a video that shows what's going on, so I'm gonna, let's go to the video, and it's gonna be hand demonstration of what goes on when we don't have normal scapulohumeral rhythm. So I have my cheesy hand example going on here. So what it is is that, so that hand that I'm pulling out right there, that's gonna be the humerus, and then my opposite hand, that's gonna be the glenoid fossa, that's a part of the scapula. So normal biomechanics is that we're gonna have the humerus and the scapula, they're gonna glide together in a two-to-one ratio, just like that. Now if someone comes along and tries to passively move an arm without having active range of motion, what's gonna happen is that if someone passively ranges an arm, they're gonna grab ahold of that humerus, but that scapula is not gonna go anywhere, and then what's gonna happen is that we're gonna have impingement in between the humeral head and the acromion of that supraspinatus muscle, that key rotator cuff muscle, and then we're gonna have that impingement that occurs within the shoulder. And that's gonna cause
a lot of pain and irritation just because scapula is not following along, we have abnormal scapulohumeral rhythm, and so we have that impingement that occurs.

Okay, so let's go back to our slides. So what happens with scapulohumeral rhythm when it's, so when we have a non-moving scapula and a passively moving humerus? So this means, this is a patient that they cannot elevate their arm, they can't raise it up into space, and someone comes along and passively ranges their arm for them. When someone passively ranges their arm, that acromion is gonna impinge up onto that, that humeral head is gonna impinge up into that acromion, and then right at 90 degrees is when we have subacromial trauma. Subacromial trauma causes a lot of issues that's going to then cause other orthopedic neurological issues that go along with it, so subacromial trauma is something that we really want to avoid. What happens with subacromial trauma is that we have impingement of the supraspinatus underneath the coracoacromial arch, and then we're gonna have that rotator cuff injury because we're impinging supraspinatus, and we have a lot of impingement syndromes that happen. You have increased pressure on the subdeltoid bursa, not too big of a deal, but it does cause a lot of irritation that happens within that shoulder. We have impingement of the brachial plexus, and so then we had a peripheral nervous injury on top of the central nervous injury. We have impingement of arterial and venous supply, and we have overstretching of the glenohumeral capsule. So this causes a lot of issues when you have that subacromial trauma that occurs within that, when you do passive range of motion above 90 degrees for someone who cannot actively move their arm.

So when we have that subacromial trauma, it causes orthopedic injuries, it causes peripheral nervous injuries, and then we're having overstretching and we're changing that blood supply to the entire limb by changing that arterial and venous supply. So the subacromial trauma, when we passively range someone's shoulder above 90 degrees when they cannot actively go above 90 causes lots of problems. So we really want to reinforce that if you have a patient who cannot actively move their arm above 90
degrees, do not perform overhead raises, do not teach your patient to interlace their fingers and to raise their arms above their shoulders and do range of motion above 90 degrees, and we teach our patients do not perform passive range of motion greater than 90 degrees to the shoulder without regard to the scapula because you're going to have subacromial trauma that occurs along with that. So we want to make sure our patients really understand if they cannot actively go above 90, you do not want to passively go above 90, 'cause that's gonna cause subacromial trauma. There's also not only orthopedic issues happen, but then we also have neuropathic pain that occurs as well. So neuropathic pain, this was a really interesting study done by Braus, Krauss and Strobel, they were looking at patients who had neuropathic pain as a secondary complication after a stroke.

So they had this hypothesis, if they thought that the neuropathic pain was occurring because of peripheral injury, so they did an autopsy studies and they looked at patients who had confirmed neuropathic pain in their shoulder, and what they found in the autopsy studies is that these patients had confirmed micro-bleeding in the subhumeral state, so they did have confirmed subacromial trauma. So what they did is they put together a prevention protocol, and with this prevention protocol, what they did is that they educated everybody to prevent the injury, so no passive range of motion greater than 90 degrees. Any position or activity that caused pain, that was changed immediately, they mobilized the scapula before movement of the shoulders and we'll talk through a set of mobilizations so you know what those are, and also no infusions into the hemiplegic hand, I thought that was a rather interesting one. When they looked at their outcomes, there was a significant decrease of neuropathic pain from 27% to 8%. So not only does subacromial trauma cause an orthopedic injury, but it also causes neuropathic pain as well, so we have to be very, very careful of what's going on with a patient's shoulder. So what we know is that subacromial trauma is very much so preventable, and education is key. We need to train the patient, the therapist, staff, family member, everybody that's gonna have contact with that patient that you
do not passively range their shoulder above 90 degrees if they cannot actively go above 90 degrees. I have on here a link to an education handout that is very beneficial that helps explain to family members and to patient how to be able to protect their shoulders, that you don’t have that subacromial trauma.

You want to make sure that you’re doing proper handling, so no pulling, no twisting on the arm, so make sure that it’s not being caught in anything. During ADLs and transfers, you don’t want to be lifting that arm up above their head to be able to put deodorant on or to get that shirt straightened out, during transfers, you don’t want it caught on anything, and you also want to make sure that you avoid inappropriate treatment choices, like you don’t want to put that arm into a pulley and then be able to stretch it out, that is then supported, that that is going to cause subacromial trauma. So no overhead pulleys and no stretching that arm above 90 degrees. When we work on positioning, we want to make sure sure that that arm is supported, so we’re looking at lap trays, or half lap trays while they’re sitting in a wheelchair, or making sure that that arm is supported while they’re laying in bed just so they have no awareness of where that arm is.

Really important thing to understand is that you let active range of motion determine a patient’s passive range of motion limitations. So if they can actively go above 90 degrees, so when they hit like that 90, 120 degree area, that scapula is starting to move along with it and it’s doing, and scapulohumeral rhythm is doing exactly what it needs to do, then they don’t need to follow this rule anymore, they don’t have to have that 90 degree limitation, but if they do not have that active range of motion, they need to follow the 90 degree rule, meaning no passive range of motion of the shoulder greater than 90 degrees if they cannot actively go above that. So you also want to make sure that you are doing biomechanically safe passive range of motion. What is biomechanically safe passive range of motion? I am so glad that you asked that question. So let me show you a series of mobilizations that we can do to be able to
help with biomechanically safe passive range of motion. So when we do biomechanically safe passive range of motion, there's two sets that we can do, so there's one set that's either done by the therapist or the caregiver, and there's another set that's done by the patient. The first set of scheduling mobilizations I'm gonna show, they are done with approximation of the scapular joint, and then there's another one that's going to be put in there and that's range of motion of the shoulder with regard to the scapula.

So let go ahead and we're gonna talk through these and we'll go ahead and talk through them. So these are a series of mobilizations that you can do with your patient, so the first one that we're gonna learn is for scapular elevation. So what happens is that you have to make sure that your patient is in upward posture, because remember, we're building on top of everything, so we're in upright posture first, and then you approximate the scapula. So earlier in this presentation, I showed you how you approximate the scapula, rotate the globe, get that scapula and humeral head gliding together along the ribcage, and that's your start position, and then you're going to stretch them into scapular elevation. So all right, so we will go to the video and we'll take a look at the video on how to be able to do this mobilization. So we're gonna have our patient sit upright, and here we are, we're gonna approximate. So you're gonna take that back hand 'cause we're on the scapula, and you're gonna put the interior angle of the scap in between the hypothenar and the thenar eminence on your hand, and then you you're gonna ask your patient to shrug their shoulders, and then I bring my knee up to be able with this push, and then you're gonna ask your patient to slouch, there we go, and this is the only time I ever allow my patient to have bad posture, so I tell them to live it up in this moment, and what we're doing here is that we are stretching for latissimus dorsi.

Okay, so let's go back to the PowerPoint. So that is the stretch for scapular elevation, stretching latissimus dorsi. The next one is going to be stretching for scapular
depression, so same thing, we start in upright posture and then we approximate, and then what we're gonna do is that we're gonna stabilize the scap, and then we're gonna have them move, so we're gonna stretch for scapular depression, so moving in that inferior direction. All right, so let's go to the video, we're gonna take a look at this one. So we're gonna have our patient sit upright, and we're going to approximate that scapula. You're gonna take your fingertips so you're gonna put it right on the spine of the scapula, and you're gonna ask your patient to move their head in the opposite direction, so bring their opposite ear to their opposite shoulder, and this is stretching upper trap. And when you do this stretch, you're gonna stabilize and they're gonna move, so as far as they move is as much stretch as they get. And then when you're done with the stretch, you have them come back up. Okay, so let's go back to the PowerPoint. And that particular stretch is stretching for upper trap.

Okay, next one is for scapular adduction, so let's go to the video and we'll show this one. So same thing, we need our patient sitting upright, and then we're going to approximate the scapula. You're gonna take your thumb and you're gonna put it right into their armpit, right in that axillary space, and you're gonna ask your patient to squeeze their shoulder blades together, and I reposition my fingertips a little bit just to get a better hold. And you ask them to turn their head in the opposite direction, and what we're doing here is that we are stretching pecs. And this is another stretch that the patient controls, you stabilize, they move, as far as they turn their head is as much stretch as they get. Now if your patient does not feel this, you have them bring their head back to center, then you have them put their opposite hand on their opposite hip with their thumb pointing down, and then they turn their head and they twist their trunk, and twisting is far as they can, and same thing, you stabilize, they move, so as much as they rotate is as much stretch as they get. And so this one is gonna be stretching for pecs. Okay, so let's go back to the PowerPoint. Okay, our next one is gonna be for
scapular abduction, so this one is when we’re gonna be moving that scapula away from the spine.

All right, so let's go to another video. So same as before, upright posture, and then we're going to approximate the scap. You’re gonna take your fingertips and you're gonna put it right on the medial border of the scapula and you're gonna lean back, and you're gonna ask your patient to reach for your shoulder with their unaffected hand just like that, and you want to make sure that your patient reaches out for your shoulder, you want to get all the way out there. And what we’re doing is this stretch is we are stretching for mid trap and rhomboid. Okay, so let's go back to the PowerPoint. Okay. Next one is stretching for upward rotation, so this one is getting the entire complex, and so we've done before true directions and now we're gonna do some upward rotation. All right, so let's go to the video, we're gonna show how to do this one. Okay, so you're gonna have your patient lay on their side, you're gonna have them lay on their non-hemi side, hemi side on top, you're gonna be facing anterior to anterior, so you're gonna be looking at your patient. One arm is going to support their arm, and so you're gonna have, be able to fully support their arm and the other hand is gonna come back on the medial border of the scapula. And the hand that is on the scapula is the powerhouse of this stretch, so right where that hand is on the scap, that is what’s causing the stretch. The other hand that's over here that's just supporting their arm, that's all it’s doing is supporting their arm, it's not doing anything more. All the power of the stretch is happening back here with the hand on the scapula. And so when you put that hand, your fingertips right on the medial border, you're gonna pull that shoulder into upward rotation, and you're still gonna recognize the 90 degree rule on this because you don't want that shoulder to go past 90 degrees. Okay, so let's go back to our PowerPoint.

Okay, so the last stretch that I'm gonna show, oh, I almost forgot, this stretch is getting the entire complex, so this one we’re getting mid trap, low trap, upper trap, or sorry,
mid trap, rhomboids, and lower trap, and latissimus dorsi, that’s what we’re getting. Okay, now you can range the shoulder above 90 degrees, but you have to be very, very specific on how you do this. It has to be done with regard to the scapula, so you have to include the scapula when you do this stretch. You have to make sure that when you’re doing this that you are supporting the scapula with one hand, so this hand right back here, it is on the scapula, and it’s causing that scapula to go into upward rotation. You are also having that elbow crease facing up because you want that humerus to be in external rotation, so that thumb needs to be pointing up towards the ceiling. When you do this stretch, you have to make sure that majority of the power is happening back here on the scapula because what you’re doing is that you are simulating scapulohumeral rhythm, and then you are going to range up to 140 degrees, and that’s where you’re gonna stop. And if you don’t know where 140 degrees is, then pull out your goniometer and know where that limitation is. So you can go above 90, but you have to be very, very careful with this because if you do any of these components incorrectly, you will cause harm, you will cause subacromial damage, and you’ll cause trauma within that shoulder. So you have to make sure that you are doing all of these components correctly.

You also want to be careful who you are doing this with because you have to be very conscious of, many of our patients have cognitive limitations or not able to understand exactly what’s going on or their family members might not understand why you’re telling them no passive range of motion above 90 degrees, but then in your therapy session, you come in and you go above 90, so you have to be very clear who you're doing this with 'cause you can cause a lot of confusion and a lot of uncertainty on what's going on. So you do not have to do this stretch, you can do the five previous that I showed and you will be very confident in knowing that you were doing good range of motion to that scapula, so you don't have to do this stretch if you are concerned about confusion, or if you’re concerned about subacromial trauma happening if you're not doing this correctly. So let’s go ahead and take a look at the
video on how to be able to do this stretch. So you want to make sure that that hand comes back onto the scapula, you’re gonna cause that scapula to go into upward rotation. You’re gonna have the other hand onto the, make sure that that humerus goes into external rotation, and that elbow crease is gonna be up, and you’re gonna stop at 140 degrees, that’s gonna be your limitation, that’s how high you go up. So make sure that you do all of these components together correctly. If you don’t, you will cause harm, so make sure that you have all of them set up correctly. Okay, so let’s go back to our PowerPoint.

All right, so what scapular mobilizations are appropriate at the time, because I showed a bunch of different mobilizations that are available, but you got to do a little bit of problem solving to know which ones are going to be appropriate. So you have to look at your patient and do a postural assessment and look at their scapular position to know what is gonna be the best stretches to be able to do. So we’re looking at our guy here, and we’re looking at his right scapula. This scapula is in more of an inferior position compared to his non-hemi side, so he needs to do the stretch for scapular elevation to be able to match the non-hemi side over here. He does not need a stretch for depression ‘cause he’s already in that position, so he needs a stretch for scapular elevation. When we look at the space in between the root of the spine of the scapula and the spinal column, it is wider than it is over on the non-hemi side, so he’s going to need a stretch for scapular adduction to match the non-hemi side. He does not need a stretch for scapular abduction ‘cause he’s already there. When we look at the position of his, of the spine of the scapula, he’s in more of a downward pitched direction, so he is in a downward pitched direction, so that means that he’s going to need a stretch for upward rotation. So for this guy right here, we would do the stretches for elevation, adduction, and upward rotation, and that tends to be the trend for lower-level patients. For higher-level patients who have a little bit more spasticity, when that shoulder sits in a more elevated position, then they’re going to need that stretch for scapular depression. And nearly all patients who have problems with their movement of their
upper limb are gonna need a stretch for upward rotation, that tends to be the trend. So there are also, we talked through all of the stretches for what you can do as a caregiver, as a therapist or a caregiver and what they can do as a part of their mobilization for their shoulder.

Now what about biomechanically safe passive range of motion that a patient can do on their own? So what we can have our patients do is that we can have them support their arm, so have them support their non, have them for their hemi arm with their non-hemi arm, and what they’re doing is what they are doing trunk rotation and they’re going in different directions, and what we’re looking for is scapular adduction while they do trunk rotation, and they have them go back and forth, so we’re trying to get them to stretch for scapular adduction. What I also have my patients do is work on active scapular stability. So I have my patients work on bilateral shoulder elevation or scapular elevation, so I tell them to shrug their shoulders. Also work on bilateral scapular adduction or retraction, so I ask them to squeeze their shoulder blades together, and then I have them do posterior shoulder rolls, so roll your shoulders backwards. I don’t have them do anterior shoulder rolls because the anterior side is already plenty strong and they’re already seated in that flexed forward position, so we want to strengthen everything on the back side. So I have my patients do these four exercises, I have them do that scapular adduction, shoulder shrugs, shoulder blade squeezes, and posterior rolls 10 times every hour. Now, I know that sounds like a lot. Now you are guaranteed at least three times a day when you do that, when you have the standard home exercise program, but there is a significant difference with patients who exercises every hour and the ones that don’t, and it really takes less than five minutes to be able to do those four exercises it usually takes about two to three minutes, and then more repetition and the more activity that we have, the higher neuroplastic effect, and the more recovery that they’re gonna get.
So I tell my patients every time it hits an o’clock, I want you to do your exercises, so eight o’clock, do your exercises, nine o’clock, do your exercises, 10 o’clock, do your exercises, you’re kind of catching on the drift here, so every hour, just do those exercises. And when I explain to my patients, if you really want to get some good recovery, just make sure that you do these every hour and when they figure out that the repeated activity in their shoulder gets them better recovery, they’re onboard, they’re ready to do that. So I have a lot of patients that once they understand the more that they strengthen, then the more that their shoulder’s going to have better recovery, they’re on board and they do it right away. So there’s really good exercises to do throughout the day. I did have one patient ask me if she should wake up hour throughout the night and do those exercises and I told her, "No, no, no, no, no, "make sure you get your sleep at night time." So only do those during waking hours, so every hour during waking hours, make sure that you get your nap so you sleep at night time. This last exercise that I have my patient do is I have them do the stretch for external rotation, because there’s a high association between the lack of glenohumeral external rotation with association of pain, so we really want to increase that external rotation 'cause that is going to decrease pain.

So I instruct my patients to, so lay supine, bring that arm out to about 45 degrees, and then rotate that arm back and lay that back on a pillow to be able to get to that external rotation. And you want to have them stay for about 20 minutes, 30 minutes is the maximum that you have them do that. Now this is also the position that you want them to be able to achieve, so if you start to work with your patient and they’re not performing full external rotation, then that’s a part of your therapy program to be able to increase that, so then when they are able to do this, they’re able to bring that shoulder out to be able to go to 45 degrees and be able to rotate back and lay and be able to get that external rotation, 'cause if you have external rotation, that increased external rotation is going to decrease the occurrence of pain, so that’s gonna be really, really beneficial to our patients. And this is a stretch that you want to start out right
away to make sure that they have that decreased occurrence of pain, it’s really, really beneficial. So if you work in acute care, inpatient rehab, or in SNFs, and you see those patients right away, for stretch, you need to work on when you start to address the shoulder is start to work on external rotation. Okay, so we’re gonna start to talk a little bit about interventions now for the shoulder. So you can do E-Stim, NMES for the shoulder, but when you put the E-Stim pads on, you want to make sure that you’re putting those on to the supraspinatus and the posterior delt.

There's a common misperception that you want to put the electrodes on posterior delt and upper trap, and you don't want to do that, you want to put that onto supraspinatus, reason being why is earlier I had talked about how there's an internal layer of muscle and an external layer of muscle. The internal layer of muscle is the rotator cuff, and the external layer of muscle is the upper trap and the delt, so you want to make sure that we’re getting to that rotator cuff muscle, so we’re hitting it right on the supraspinatus. This approach has been proven to prevent and reduce the subluxation, but you need to make sure that you follow the protocol. The protocol is six hours a day, five days a week for six weeks, that's the protocol. So it’s not like 30 minutes every one of two times a week when you think of it when you have a unit available, this is for when a patient has their own unit, they’re wearing it for the full six hours, they’re following that full protocol, and that’s when we have that full benefit of when we have that protocol. So keep in mind, that’s a very long protocol, this is a patient that has their own units, they’re able to keep it throughout the day and be able to have that five days a week for six weeks, that’s what the protocol is. The rationale is that we are very much re-educating the glenohumeral joint muscles and repositioning that humeral head, and there is also really good evidence this is very successful, that it does help to prevent and reduce the subluxation. Now keep in mind, it does not reduce hemiplegic shoulder pain following stroke, so if your patient has pain, this is not gonna be the approach that’s gonna be able to help address that, there’s different interventions that we need to look at for managing pain, but E-Stim is very good for
reducing that subluxation if you follow the protocol. Last thing that we’re gonna talk about today is taping for the shoulder. There is conflicting evidence that taping reduces pain.

One of the main reasons is because these studies really didn’t separate out the difference in between if it was neuropathic pain or if was that orthopedic alignment that was causing pain, so you really got to keep in mind that if we’re talking about orthopedic alignment, it’s gonna help create that shoulder stability. It really comes back to that whole concept I talked about earlier, that inner layer versus outer layer. The inner layer is that rotator cuff muscle and the outer layer is the delt and the upper trap, and what happens is that tape is going to mimic that outer layer because it’s on top of skin, so it’s gonna mimic that outer layer of delt. So it really is good at helping to be able to get that realignment in there, and it is good at reducing pain, but we’re not very sure it may improve spasticity, disability, range of motion or motor function, but it’s really good at that alignment and being able to decrease pain. So when we do taping, we got to make sure that we do postural training tape first, and then we’re gonna make sure that they have active range of motion before we tape their shoulder because you gotta remember how tape works, it’s a reminder of what position that they need to be in and what direction that they need to be in, it’s not going to force any muscle group to activate or to move, so you need to have active muscle movement around the joint for this to be able to be effective.

So here’s a final picture of the tape that I had shown earlier on how to tape for posture, and then I’m gonna show how to be able to tape for the shoulder. So let’s go take a look at the video, and first I’m gonna show is gonna be tape for anterior hyperlaxity. So this is when that humeral head is slid forward and that’s when it’s that anterior subluxation. So we already have tape on for posture and the back here, so that’s what we had going on back here, and what’s gonna happen is that I’m gonna put on the protective layer first, and it’s gonna come a couple inches below the humeral head,
'cause we’re gonna search for having that humeral head glide backwards. Same thing as before, this is the protective layer, you want to have as few wrinkles as possible in that tape, and then we’re gonna put on the mover on top of that, the Leukotape or the McConnell Tape, and it’s gonna slide that humeral head posterior. And the same thing with this tape as with when we were looking at posture, this tape is going to last as long as the adhesive does, so usually about two to three days. You can shower with this tape on, you just don’t want to saturate it, ’cause that’s gonna break down the tape quicker. So here we go, we’re gonna anchor right below the humeral head, and we’re pulling that humeral head posterior and we’ll get that glide, so that we have that posterior glide that that anterior hyperlaxity. So that’s how you tape if they have an anterior subluxation or an anterior hyperlaxity.

Let’s look at our second video that we have for this, and this one is gonna be for an inferior subluxation or an inferior hyperlaxity, and this one is gonna mimic delt. So the key point for this one, it’s gonna be a couple inches right below the humeral head, we gotta make sure we have our posture. And so this is gonna look like a V, so one side of the tape is gonna go on one side of the humeral head, and then one is gonna go on the other side. So when we do this kind of, this style taping, one side is gonna be longer than the other, so the posterior side is gonna be longer than the anterior side, and reason being is because the neck and the clavicle are gonna get in the way, so there’s gonna be a longer contact on the back than there is gonna be on the front. So here’s the protective layer, and same thing, we really don’t want too many wrinkles in there, we want to try to get as flat as we can. Okay, so now we’re starting to put on the Leukotape, so before it was the protective layer, now what you don’t want to do is that you don’t want to tape one side and then the other ’cause you’re gonna have an uneven pull. So what you want to do is you want to go halfway and then stop, then you want to let that tape hang down until you get ready to do the other side. Reason being is that if you tape one side and then the other, you’re gonna have an uneven pull, so whichever one that you tape first is gonna have that higher dominance in that pull.
direction. So, you want to tape, get one side on, stop, let it hang down, and then you come to the second side and you do the exact same thing, you go halfway and you stop, and then one side in one hand, one in the other, and then you pull up, and then in symmetrically so that humeral head has the same amount of pull for both sides. 'Cause if you don’t, you'll have that uneven pull, so that's how you get the symmetrical pull. Okay, so let's go back to the PowerPoint.

Okay, so here is the, I went the wrong way, here we go, here is the final picture for what I had just shown in the video, so here is the taping for the anterior hyperlaxity and this one is for the inferior hyperlaxity, and you can have both at the same time. Oh, here we go, I almost forgot, so here's the tape for the anterior hyperlaxity, and then here is the one for inferior. And then you can have both at the same time, it’s just that I show this one on the other one so we can have just clarity on which one it is, but you can have both at the same time that they have an anterior subluxation and an inferior subluxation at the same time. Last exercise that I'm gonna show is this is a really good one for being able to make sure that we have scapular stability, and I do this exercise a lot. I have my patients, because it's so hard to be able to fight gravity and we have such a difficulty with them being able to move through that scapulohumeral rhythm, I get a lot of my patients into gravity minimized or gravity eliminated so they lay on their side, and I do active assistive range of motion. And what the purpose of this is we’re really trying to get stability of the scapula on the thoracic wall, really emphasizing upward rotation. And why? Because that is exactly what scapulohumeral rhythm is, that's why we’re trying to get that stability, that’s gonna increase their shoulder movement, and ultimately the goal is to decrease that subluxation and to increase the strength of the rotator cuff, and be able to increase that scapulohumeral rhythm.

So what we do is that I have my patient lay on side lying, and they're doing chest press, they're just reaching that arm forward and then bringing it back and making sure that we get really good retraction of that scap and then pressing forward. Okay, so we
have made it all the way through, so this is everything that I've got for today talking about that hemiplegic shoulder. So I hope you enjoyed this webinar for today, and I hope you guys have a great rest of the day.

- [Fawn] Thank you Christine for a great talk. I hope everyone has a great rest of the day, you join us again on continued in occupationaltherapy.com. Thanks everyone.