Aquatic Interventions for the Upper Quadrant
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- [Calista] Our course title today is Aquatic Interventions for the Upper Quadrant, and it is my pleasure again to welcome back Dr. Beth Scalone physicaltherapy.com. Beth is the owner of North County Water and Sports Therapy Center in San Diego, California, specializing in aquatic and orthopedic physical therapy since 1997. Beth is an orthopedic cstiertified specialist, Certified STOTT Pilates instructor, and an Aquatic Therapy Rehabilitation Institute Certified therapist. in 2010, Beth was honored with the Aquatic Therapy Rehab Institute's Tsunami Spirit Award, for her contribution to the aquatic therapy education. And in 2012, she was named aquatic therapy professional of the year. And in 2015, the aquatic section of the APTA presented Beth with the Judy Cirullo Ward, in recognition of her promotion to aquatic therapy. Additional aquatic therapy certifications that Beth have include a master instructor for the viDingo method, and a trainer for Aqua stretch, which is a myofascial release technique performed in the water. And so we are so pleased to have Beth once again presenting for us, and at this time I'm gonna turn the microphone over to you.

- [Beth] Thanks Calista, good morning everyone. I hope everyone is staying warm, and am happy today, and happy Friday. And here you can see on this slide, my contact information is beth@waterpt.com. So if you have any questions, you can always reach out to me, just put something in the subject line, you know take your course on physicaltherapy.com, or something like that, so that I don't get to delete happy, since we all get so much junk mails these days. So we chose this subject in part because one of the biggest questions I get sometimes from therapist is, how do you deal with patients with upper quadrant issues in the pool, because we are so used to dealing with things, but let's before we get started, I've gotta read these objectives, So let's get that out of the way. So at the end of this course, the participants will be able to write at least two medical justification statements supporting aquatic therapy interventions in the treatment of upper quadrant dysfunction. Identify at least five basic rehabilitation goals for upper quadrant impairments, with decreased pain, reduce muscle tension,

increase mobility, improve muscle balance, and restore partial awareness, with the appropriate aquatic therapy interventions. Based on research, participants will be able to describe at least two important factors of the thoracic spine mobility in relationship to shoulder neck dysfunction, and pain. And progress a client through water exercise to improve posture, increase upper quadrant strength, and decrease stress and tension in the cervical muscles. So, one of the things is how do you utilize the aquatic environment to achieve these rehabilitation goals with upper quadrant impairments? We're so used to low back, and arthritis, and hip and knee, but I think sometimes the water isn't utilized to it's full potential for the upper quadrant impairments. So thinking about that, we're gonna to try to talk about how the water really helps address some of these issues.

So, it's a clinical decision when do we use aquatic therapy, and we wanna look at the properties of water to help us make that decision and apply it to the correct patients. Excuse me, first let's talk about some research that we know and we're gonna start with buoyancy. So in this study here, Kelly at all kind of looked at the rotator cuff muscle activation, and as well as the anterior and posterior middle deltoid, during shoulder elevation in scaption, to the plane of the scapula, and they've compared land to water movements.

Now this picture here shows a weight in the study, no one was holding a weight on land. So it was just a picture I found. So basically, if they were moving at slow speeds between 30 degrees per second and 45 degrees per second, there was significantly less activation of those muscles in the water compared to land. However, when they sped up the movement to 90 degrees per second or greater, because of drag force, the water cause greater activation of the muscles. So, kind of the moral of the story is slow movement. We're gonna get that active assist, you speed it up and we're starting to get resistance to the water. And that will come into play, especially when you're dealing with like a rotator cuff repair, and they're still in that active assistive phase of rehab. You

wanna make sure you're keeping them moving slowly versus having them go too fast. So, but remember, buoyancy provides this environment that allows that active assistive shoulder elevation. And really, what does that do for our patients? It reduces pain and compensation of the upper traps. So, you think about it, everybody kind of uses that shoulder shrug to start that arm movement when they're in pain or weakness, and you can really help correct that movement pattern, by using buoyancy to support the arm. It also supports the weight of the upper extremities, allowing us to strengthen those thoracic muscles along with the scapula thoracic muscles. So the mid and lower trap without that over trap, the upper trap trying to kick in.

So we'll talk about that today. But those are some of the things you can think about when you're seeing those movement impairments on land, and doing your assessment. How the water might help those individuals improve their movements. So, one of the questions I get well is, how does water help the cervical spine? And a little trivia here, just because I was fortunate enough to go to Africa last year, and most of you probably know this, but how many vertebrae do giraffes have? And they actually have seven, just like us, they're just much bigger, and they have this big long neck. So, that's why that picture is here.

But, we don't dunk people underwater, usually in water therapy, and we might want to but we don't. Usually they keep their head above water. So how does this help the cervical spine, if you're not completely submerged in the water? Because the head is out, and so we still have the weight of the head. And what I'm gonna have you do here, is I want you to, sitting in your chair, see if you can just turn your head to the right and left. Okay, just kind of get a feel for how far you can go, and what kind of strain, pain or restrictions you might have. For those of you that are young, you might not have any, if you're my age, you're gonna feel it. And then what I'm gonna have you do is support the weight of your arms. So either on the chair, arms, or on your desk, or some way where you're, the weight of your arms is no longer pulling down against gravity. It's

supported by some surface, and the muscles in your neck are nice and relaxed, and then turn again. And what you'll find is, oh, hey, you've probably moved a little further, or with less discomfort. And this is one of those kind of clinical screening tests I do with my cervical spine patients, when I'm doing it about, I'll support the weight of their arms, and if they get increased movement, or decrease pain with that, that's a good indication that maybe the buoyancy of the water supporting the the weight of the arms, will help reduce, will allow better range, and decrease compression forces on those joints. So, we wanna think about potentially using that, since it's just a little screen that I use, it also gets a little bouyand the patient says, "Oh, wow, I can really move further, "when the weight of my arms is not pulling down." So, you can build up their scapular strength, move there.

Now, the other thing we have in the pool is the hydrostatic pressure, right? So we use that to reduce edema and lymphedema, it provides input for tactile defensiveness. So I know this is a picture of lower extremity, because it reminds us that the deeper you go, the more the pressure is. So the pressure gradient is going at the ankles, the highest amount of pressure, and then the closer to the surface, it's less. So when you're doing that, if you have a demon hand, if it's under the water, it's gonna be a greater amount of pressure, but it's actually great for lymphedema management for after post mastectomy and other things like that.

So just remember that the high discharge pressure helps that, it also increases blood flow to the muscles. So even if you're just sitting in the water and not doing anything, So great for people with small vessel disease, like diabetics, and that kind of thing to kind of increase that blood flow to the muscles, and help with healing. So, drag force. So we've got buoyancy, hydrostatic pressure, and drag force are the unique properties that we're usually dealing with in water compared to land. And so, backwards walking will change the muscle activation, and I wanna point out the Paris finals here because most of the time in the upper quadrant, we're trying to strengthen those mid back and

thoracic spine extensors, right, 'cause they've got that rounded shoulders and kyphotic posture. And so if walking backwards can help improve the strength of that, now keep in mind you need to have them stand up tall while they're doing it. You can't let them just fall backwards, like many people kind of just sort of go backwards. So, thinking about that as a way to work on posture control is getting them to walk backwards. And then of course, if you're dealing with lower extremity as well, the quads in the anterior tip are also increased compared to walking forward in the pool.

So remember, surface area and speed will influence the level of resistance for drag force. So usually, especially in upper extremity, I know that on land, I'm always like, do i give them a weight, how much weight do I give them, one pound, two pounds, five pounds? And I always start very conservatively and then if they tolerate it i move up. But in the pool, if they don't physically have the strength to move against the drag force faster, they won't. It's sort of self-limiting. So that's kind of a nice feature. And one of the things I always wanna encourage people is try to increase the speed of an exercise, as they're tolerating it. If their symptoms are low, and their form is good, add the speed first before throwing the equipment in there.

We all like to get our toys out, I know I'm guilty, I go to a conference and find a new toy, and I'm like, whoo, I'm gonna use it with everybody, but think about increasing the speed first is the safest way. And then as they can tolerate, you can add the drag force equipment to increase the challenge even more. So another nice benefit to the drag force is the study. They were looking at the consistency of the resistance, if you kept the cadence the same, and of course, because the drag force equation is a physics equation, yes, if you stay consistent, then the resistance stays there. But what they found was, as a side note, that as they did more, faster movements, the pair spinals, and core contraction of the core muscles occurred. And that's great, because one of the things when we're working on upper quadrant in the pool, we're also getting some of those core muscles and promoting that strength. And we know everybody could

really use some balance and stability in their lives, especially some of the population that maybe we have in the pool. So, realize that's an added benefit. Another medical justification for the pool might be the person that has fallen, and has both an upper quadrant and a lower quadrant issue, right? Because so often we have more than one body part these days, and the pool is nice ,' 'cause you can kind of do exercises for both, and address both areas. Alright, so this was an interesting little systematic review, looking at the effectiveness of aquatic therapy. And they concluded that there is strong preliminary evidence 'cause we don't have a huge amount of studies that is an adjunct, it'll increase range of motion, and decrease pain in patients with shoulder impingement, and rotator cuff repair.

That's the studies that they looked at. So, it also found that they improve sleep quality and overall function. And we know today that with chronic pain, sleep is an important factor in recovery for that as well. So I think that this is a nice study and it can help you justify it to your docs about using the pool in adjunct to your land-based programs. This study was nice because what it did, was it took a rotator cuff repair clients, and they did either water and land combined, or just traditional land-based protocol. And what they found was that in the water-based program, the range of motion was greater in the first three weeks and at six weeks compared to land.

Now I will tell you the long-term outcomes, there were no difference in the groups. So ,if the person isn't really appropriate for the water, then it's not going to be a detriment in the long run. I think it proves that the water can be safe for these individuals. And of course, they also stated there's no difference in attendance rate or the patient's perception of the therapy. So something to think about. Okay, so what are our rehab goals? We usually have to get some more motion or mobility in that upper quadrant, because it's a functional thing. We got to be able to turn and look behind us when we're driving. We gota be able to reach up, get dressed, all of that kind of thing. Reduce or eliminate pain, because so often that's what brings them in the door, or

they've had surgery and they've got some of that post-op pain. Increased strength and endurance, of course, and establish or reestablish some partial awareness in position sense. So many of our clients have no idea where they are in space. I come in and they're slouched over and I say, "I think we need to, one of the things I want to do "is we wanna work on your posture." And you would think if you said that the person would attempt to sit up straight and be like," Oh, yeah, you're right, I'm slouching." But so often they don't, because they have no idea that they're actually in a bad posture. And of course, the real thing that we do as physical therapists is we get your back to function doing the things you love. That's really what we do, so as occupational therapists as well. I'm sure we have some of you here 'cause of the upper quadrant. So that's our role. We do help with pain and range of motion and strength, but truly, we're here to return to function.

Okay, so you can all grow now, because this is something that I'm pretty sure you learned in school, and it actually applies . But we learned that we had to get mobility in a joint in an area, and then it had to be stable. And then we had to have stability with mobility. So we had to be able to move a joint, but have it not be all over the place. And then finally move to that high level skill.

So when you're planning your rehab program, pool or land, you can think about, do I need to work on mobility? Are we now in that trying to keep it stable? or now we trying to do a little more functional stability with mobility? And then what are we moving towards? Do they have to be able to throw a baseball, or we just need to be able to carry our groceries into the house? So, thinking about that as you're planning. Now, this is just a general treatment approach again to kinda guide the thought process. So, mobility, we need the glenohumeral joint, the thoracic spine is gonna be vague, and we're gonna talk about that. The AC and SC joints, and then muscle flexibility. And then we need scapular motor control and postural correction exercises, that's really where some of that stability comes in. We might be doing some isometrics around the

shoulder, and getting the rotator cuff active. And then we're finally moving into rotator cuff strengthening, and that PICR is path of instantaneous center of rotation. What that really means, is we're keeping the ball in the socket, and so it's not a sloppy joint. So that it's actually rotating what we're doing, and spinning in the joint, instead of it having it slide forward and back. You know that person that does the rotator cuff thing, where you see their whole shoulder go forward and back. We don't want that, we want the whole shoulder girdle. It's, we want that focused motion. And then progression of functional integrative strengthening.

So, thinking about not just isolated strengthening, but moving forward into more combined movements. All right, so when I was a student, I remember as I seat my last rotation, orthopedic rotation, I went to my CI and I said, "I'm doing really well with your valves. "I can figure out what to measure. "I'm pretty sure I can come up with the goals. "I'm really good, I think I'm doing good with that. "But I'm having a hard time coming up with a treatment plan. "What do I you know, how do I reach those goals?" And he said to me, "Well, you know, "you stretch what's tight and you strengthen what's weak." And it was such a simple statement, and I know it's a little more complex than that. But, it really just put the light bulb on, so whenever you're overwhelmed with a complex case, I always just sit back and say, "Okay, what's tight and what's weak?

"And this is how I'm gonna start." So I just had to laugh 'cause when he told me that I went to four years of school for this. So let's talk about the upper quadrant connections. We can't really treat in isolation, the cervical spine, we gotta address the thoracic spine and often the shoulder area 'cause, and the upper extremity, cause there's a bunch of muscles that are shared between all of these areas, right? So we're gonna talk about this, this picture is a woman and she had a stroke, and you can see that her left arm is not yet fully functional, as far as reaching and being active, and that kind of thing. So just realize if we want our hand to be where we need to be, to grasp

and reach and pick something up, we have to have the whole upper extremity, the shoulder growling, usually the thoracic spine, and neck all moving pretty normally to do that efficiently without pain. So we're gonna kind of talk about that. So first, how do you think muscle length relates to posture and mobility? Thinking about that, what's tight kind of thing? Well, here is the upper cross syndrome, yanda. And it's one of those if you look at the muscles that are typically weak in individuals, it's along the line of that darker gray line in this picture. We've got our forward head posture, and our thoracic kyphosis. So, we've got weakness in those deep cervical flexors, and lower middle trap, sratus anterior, thoracic paraspinal, so those are often weak.

But, if you look over at the orange list here, or tangerine, I guess, tight in packs, levator scap, upper traps, suboccipitals, SCM, scalenes. You could see this all the time every day, right? Those are the muscles that are tight. They're the ones that have the trigger points and that kind of thing. Well, it's gonna be impossible for us to strengthen the weak muscles if they're constantly fighting the tight muscles.

So in order of treatment plan, we got to stretch and improve mobility, or relax, or release the muscles that are tight. So that sort of, so that the weak muscles have a chance to get stronger. So usually, that's how I'm looking at it. It's like, okay, I gotta stretch what's tight, and then we'll work on strengthening what's weak. So, going from there. So let's talk a little bit about your mobility. So we can do joint mobilizations, we can do myofascial release techniques. I'm gonna talk a little bit about Aqua stretch, instrument-assisted soft tissue mobilization, if you do that on land, if you have the stainless steel tools, you can do it in the pool. If you wanna do that quickly, before you're doing that, if that's a technique you're doing, and of course, muscle stretching, and that kind of thing. So we're gonna go through a few things, try to give you some tips here. But before I go into that pecs, they're the evil villain of the upper quadrant, right? They're tight on many people, just because of what we do in our postures. They create imbalance, and you'll see it in subacromial impingement syndrome. You'll see

that this study kind of concluded that if you add a gross pec minor stretch in conjunction with your traditional treatments for Adhesive Capsulitis, you had better outcomes. And I think that most of us would do that regardless, but just as a, put it in the back of your mind, don't forget the packs. I will also kind of make a little comment here, that it does contribute to the cervical spine. So cervical spine compression, because if those are tight, it attaches to the rib cage. So if they're tight, it's pulling the ribcage down. Well guess what is also attached to the the rib cage, it's your scalings. And so if you're constantly trying to get in good posture with your neck, your scalings are pulling up against the tight packs, and so it can draw them down.

So don't forget the pec releases in, and stretches for your neck patients as well. So pec stretches. So this is just a picture, the one on the left here, let's see, is a pec minor stretch. And this is, on land we often have them on the plant, then we lean into them. But here what I'm doing is and I'm not, I'm standing kind of out of the way, so that the picture can be taken. My body would actually be right in here for better mechanics for my arm. But basically, you're gonna put the heel of your hand on the inferior border of the scapula, on the backhand. And then the front hand, the heel of your hand is gonna start kind of over here on the pec muscle 'cause it tends to slide and we do wanna avoid being on the humerus, right?

We don't wanna stretch the anterior capsule, we wanna get the pack. And basically we're going to retract with the front hands, we're gonna be pushing the shoulder back this way. This hand is pushing in to tip the scapula. So we know that a tight pec will tip the scapular forward, so we wanna tip it back. So we're gonna apply more pressure right down here. And then retract, there's a little hint here, is once you get them in that position, and you can hold it, you can have them slightly turn their whole body, not just their head, their whole body away from you and that will deepen the stretch. That's sometimes a little trick that gets it. You can also have them take a deep breath in and exhale, and as they exhale, hopefully their abdominals are being engaged that'll bring

the ribcage down and in, and again stretch a little bit more because it's pulling the ribcage down. Over here, we're doing the pec major, we're against the wall, the palms are forward, we're leaning in and pressing. Obviously, we only go to the surface of the water here, so we're not gonna be getting the sternal fibers as much. Human sternal fibers need to be at about 120 degrees of abduction, and I can do that supine, if the person goes supine, but I tend not to have the arm out of the water. Okay, this is a little clinical pearl, and it's funny ;cause it took me I don't know how long to come up with this. I use the foam roller a lot on land, and I really liked that it gives the scapula ability to move a little bit around and stuff, and I'm like, "How do I do this in the pool?" And for years I've tried to just, I'm like, "Well, you can't the pool keeps pop, "the noodle keeps popping up." If you Lean back into it. And one day my brain actually was working, and I learned, oh wait, you just sit on it like a horse, and that keeps it from popping up. And then here you go.

Now you can stretch back a little bit and get a little more stretch. So there's that little clinical pearl. I would say, if you have a patient that's still it's a little squirrely, the buoyancy is too much to control, or maybe they're a little frailer, the person that's just a little too unstable. You can take a bath blanket or big beach towel, roll it up and kind of fold it over the edge of the pool.

So you have a little bit of space. It's a little squishy, for that Princess and the Pea with a really bony spine, that doesn't like to have the pressure on the vertebral, the spinous processes, so things like that. One of my favorite things, and I think it's really comfortable. So the next time you guys are in the pool, give it a try on yourself. Okay, so we're gonna play this video because this is sort of the... Well, we've done the manual stretches, the passive stretching. And now we're gonna try to integrate that a little bit. So I'm holding the noodle down behind me. I'm keeping my collarbones wide. I'm using my lower traps to keep the shoulders away from the ears. And then I'm here, and then I'm walking forward and backwards, backwards. I'm gonna use my pair of

spinals a little bit more forward. I'm gonna try not to lean in around. Now keep in mind if I had a shoulder instability in the front of the shoulder, or didn't have this ability, this would not be the appropriate exercise. So you have to choose who this would be appropriate for, but it's a great exercise 'cause you get scapular depression, retraction, postural alignment. Okay, we can go back to the PowerPoint. Okay, so, when we're doing manual therapy techniques, for those of you that do a lot of stuff on land, if you don't do very much in the pool manually, you'll soon learn that it's a whole different world out there. The person isn't nailed to the plants by gravity, and you don't use your body mechanics quite the same. I tend to use my body weight sometimes, and the pool, they're not in the same position.

So, they have a buoyancy supported patient. And you kind of have to think about your position, your contacts, the stabilization. And it's doable for many things. It's just the consideration of when you're doing something, if you push on somebody, they're gonna move away from you in the pool, unless you've got that stabilized. Also, if you're in a pool, you share space, I share space with the public. So in the summer, every once in a while, there'll be a kid that decides to cannonball right next to us, and if I don't get to them before and say, "Wait, hold on" before he does it, then we get this big wave.

So if I'm in the middle of a manual technique, especially like cervical traction, I don't wanna have that unexpected turbulence. So depending on your situation, you may or may not have as much control over that, and you may choose when or when not to use some of those manual techniques. Collar, cervical collars, these are things there's a lot of different choices out there. And what I would say is, I love this one, it's the kind that is like your collar for the airplane, not your sleeping collar, because it puts the neck usually in the best position. Patients don't like it 'cause their ears are in the water, and their hair is wet. So we have different choices. This one is we're doing some Aqua stretch here, so it's kind of resting on here. It's one that doesn't keep the hair dry, but does keep the ears out of the water. So patients that need to hear you, and that kind of

thing, that might be an appropriate choice. This is not my favorite in most cases, but you can alter the amount of air in it. So, and I get no money for any of these collars, I'm just basically what I would recommend, is if you're gonna do this kind of stuff, have a couple different collar choices because everyone is different. This here, the neck doodle, it's nice. As we get moving and things are going around, sometimes it'll tend to scooch out if you're doing a lot of movement up here. So just things to think of, but you can get in there you can do your pec releases, and some of your your manual skills in the supine position. So challenges with supine activity. So, well again, getting that tolerance to the neck collar if people can't get comfortable, then they're just gonna be trying to hold their head up.

And that also goes down to fear. Many people that are fearful of the water, don't relax and supine, and so they're gonna be trying to hold their head up, and that's just gonna make things worse. So you may choose not to do supine activities, if you can't get them to relax, or it might take a few sessions. People with ear problems, hearing aids, a lot of people are deaf, even with their hearing aids, and then you take them out to put them in the pool and then you put your ears in the water, you gotta come up with some sign language, or tell them what you're gonna do before they they get down into the water.

So thinking about that, your problems, people that are prone to to ear infections, they can wear earplugs. I don't like water going in and out of my ears, if I'm gonna be supine. i like my ears either kept out of the water, or completely submerged, but for me, I don't like the water going in and out. So if it is gonna happen, I'll wear ear plugs. Vertigo, you know somebody that has BPPV, or a vestibular hypo function, lying them supine and spinning them around in the pool, doesn't usually work, so you wannabe caught cautious, and when you come out of the supine position and you're getting them vertical again, just remember kind of standby, people might be a little dizzy or lightheaded, so it's something to be ready to just get them reorient. Sensitivity to light.

My pool is outside, because I'm fortunate enough to live in San Diego, but so the sun can be pretty bright. But also many of you have lights above the pool that patients may or may not like the lights. So they can they can close their eyes. We talked about fear and of course, wet hair and I have to tell you, you can't touch this, right? If they get their hair set, washed and set every week, you're gonna set that up therapy appointment to be right before the hair appointment. Otherwise, there'll be no getting that hair wet. So just sometimes we have to work around our patients as far as that goes. And for those of you in the cold climates, many people probably don't wanna get their hair wet, and then have to dry their hair to go outside and everything again. Alright, so let's look at the scalene muscles and remember that the neurovascular bundle goes through this area, and it's attaching to rib cages, the rib cage and the cervical spine.

And the way to stretch it appropriately, is to stabilize that first rib, which is right here, okay, under the collarbone. And so here is a little technique that I use for self stretching. So if we're gonna stretch the right side, I mean her left side, we're gonna put the towel under her right arm and it's gonna go around the back of her right hand, it's gonna kind of press downward to give that pull and hold. And she can turn and change the angle to get those scalings, but if you're manually doing it, you wanna try to make sure that you're keeping those ribs down because if not, as you stretch the head, that's just gonna pull and pull that first rib up.

Levator scap, okay, so here's another muscle that sort of the bane of our existence for both neck and shoulder, because it attaches to the cervical spine and down into that scapula here, and on it. To stretch it, you have to keep the scapular stabilized so often I manually holding the spine of the scapula down. You've probably all seen the VHI exercise cards, if you're older like me. Now I think it's all computerized, and we all have these video home exercise programs, but you'll see that often, the arm is raised up to do the levator scap stretch, and that's because when you raise your arm, your scapula

or shoulder blade upwardly rotates, which brings the medial superior border downward and kind of stabilizes the shoulder blade, while you turn your head and stretch. So that's why that's there, but that's hard for some patients, especially if they already have shoulder issues. So we wanna make sure that we try and keep that stable. So if you're doing some manual work, just remember you gotta kind of nail down what you're doing. And then the upper trap of course, same thing gotta stabilize that shoulder and many of us have done this stretch. If you're making doing it I like to again hold that spine of the scapula down, so that I can get a little more stretch. And what happens is if you stabilize the more distal area, this the scapula, the first rib, that kind of thing, you're not going to have as much jamming on the cervical spine joints. And the head might not go as far but you're still getting an effective stretching, you're not risking or compromising those joints.

And whether you're doing this vertical and teaching them to do some self stretching in the pool, or whether they're supine, and you're doing it manually. So we're gonna talk a little bit about cervical traction in the pool, you don't get the same amount of traction that you do on land, because the person does float through the water. So just realize it's more of a light decompression, maybe a stretch of the muscles, but we have different grips and the neck grip is just the hands are cradling the head and neck, and you're just gently pulling.

The occipital grip is like an occipital release. The fingers, it's hard to see in this picture, but my fingers are facing down towards her shoulder blades, and then are kind of just on the occiput. And kind of giving that little distraction in that area. And then we can do the mastoid grip. And that's just where your hands, your fingertips are off the neck, and you're a little bit more behind the occiput and the mastoid. Don't push into the mastoid process. It's not that we're gripping the mastoid process, it's just that that's where the fingers kind of lie. And often the, you're probably wondering, why is there a snake on this photo, I don't get it. A lot of times we'll take people in the supine and gently

support the head and kind of snake them along in the water, meaning side to side. And that just lets things relax and flow. And this snake is a perfect, I had never seen a snake sneaking and just to distract you, the story is my husband went to Home Depot, and he came home and I knew I was in trouble when he said, "Oh, honey come in the backyard, "I wanna show you something." I'm like, he just went to Home Depot, I don't need to see whatever you got, but I went out there and I guess at Home Depot, this is a California king-snake, So it's not a poisonous snake. And it was curled up in the wood stacks, and people were freaking out and they wanted to kill it. And he's like, it's a good snake, don't kill it. And he's like, I'll take it.

So they threw a few orange buckets at him and he brought it home, and he released it, and this is my deck, and the snake sneaked by under my deck never to be seen from again. So hopefully, he was hitting anything that I didn't want under my deck . I never saw it again. So, but that is kind of what we mean by snaking through the water. Okay, now that I've distracted all of you. Thinking about supine work we can do passive range of motion. This is where you can do a little bit better shoulder, ab and adduction above 90 degrees.

That type of thing you can get your hands on and kind of feel what the joint is doing. So again, if the person can be relaxed and comfortable in the supine position, you can work on that and do some of your manual work. This is just an example of how can we do passive external rotation stretching with the pool. So putting the arm in the side pool now, my pool water is, the deck is nice, because the return valve is same as the surface level. So I don't have this big dip in the water or big lip on the pool. Now if you did that might not be appropriate. You can always use a kick board and you could stabilize it and have the patient bend forward to do that passive range of motion. So this is just some ideas on mobility exercises, for the upper quadrant. Pendulums, let's talk about pendulums. It's a common exercise that we give a patient early on after shoulder surgery. But realize that once you add drag force to the water, it doesn't

become this passive pendulum moving that there's too much drag. So it often will end up encouraging active motion, so it changes the exercise. So just remember that if you're trying to get them to relax and do it in the water, you have to be really careful that they are staying relaxed in the pool and they're not working. I mean, even on land, people have a hard time with pendulums sometimes, so understanding that the concept. All right, so we kind of talked about the pec muscles already. I'm showing these here on land just for ease of seeing the lats so you can stretch, you can use the side of the pool, a kickboard or a noodle and get that position.

You wanna make sure the clinical pearl here is you're making sure that the rib cages connected her shirts kind of hanging down, it's hard to see, but so that she's not arching her back, and that she's really getting a stretch in through those slats. And then of course, posterior cap, I mean posterior capsule, kind of bring in that arm across, and we need that for people that have the tight posterior capsule. But not everybody has that, so you gotta kind of pick and choose, again stretch what's tight, strengthen what's weak.

Okay, Aqua stretch. So Aqua stretch is a myofascial technique performed in shallow water, where we apply as a therapist, or what's called a facilitator pressure to areas that are tight restricted, in theory, have adhesions. And we have the person move as they want to move, or kind of intuitively, to release them. So if you're familiar with active release technique, where you apply pressure and then you tell them where to go, you can do those in the pool, those techniques in the pool by the way. But also, Aqua stretch instead of you telling the patient, or client where to move the body part, you have them move intuitively. So you say just move where you feel like it's gonna stretch. And so you get to some indications that you don't always know where they are, because you're trusting the body or the person's body to go there. And the benefits of it are often decreased pain, it's like a deep tissue massage. So it's improved sleep and relaxation. The true Aqua stretch is a wellness program, you start at the feet, you move

all the way up, because in theory, Aqua stretch believes in the factual adhesion theory. So meaning that it's a whole body thing, and if I have an adhesion somewhere else that could be affecting my neck, so technically we do the whole body, but in rehab we're often doing focused trigger point and adhesion releases. So it increases mobility. And what I would say about Aqua stretches, it's it can be very effective. I'm gonna show you a case study in a second, but that it's a manual technique. So that's why you don't see very many online classes just talking about it, 'cause you really do need to get your hands on. So if anybody has an interest, I am potentially teaching a class in September in San Diego, on that you can contact me directly at beth@waterpt.com.

If you're watching this after that, you can always contact me if we have other hands on classes to learn this technique, but it's one of those things, that great little tool in the toolbox, that we've added into into aquatic therapy. So here's a case study. This is not my patient, it's another colleagues of mine, and you can see here definitely you would, that looks like a frozen shoulder of somebody that's not moving well, right? And has that adhesive capsulitis, and lots of compensation, and she had worked for months in painful therapy and it wasn't being successful.

And then her therapist worked on, and to full disclosure she did Aqua stretch, 'cause she's also a Gary Gray trained therapist. So she also did some clearing of some Taylor joint, did a few thoracic rotations, things like that. So it wasn't on land before they got in a pool. So not strictly Aqua stretch, but in one session, this is what she looked like. So she decided, oh, I'm not gonna go for that manipulation under anesthesia. Now, does she still have quality of movement problems? Is that joint still limited? Yes, and now here's the disclaimer like the weight loss ad's, these results are not typical. So all of us, for those of us that teach Aqua stretch and stuff, many of us have had examples of the AHA and really big results. But that's not everybody, we get the same kind of steady progression results that you get with other manual techniques. So, just so I'm not trying to sound like a snake oil salesman here, and give us one case that turned out

really well in one session, I find it beneficial for many people. And it's really fun when you get that person like this, because they look at you and think, "Why didn't somebody else do this?" And you just say, "I got lucky", right? Okay, so let's see, Victoria has a question. How is Aqua stretch equivalent to a deep tissue massage? So basically, because if you do the full program, where you do the whole body in one session, you are releasing adhesions and restrictions throughout the whole body. So when I guess, sorry, I wasn't clear about that with the deep tissue massage. At the end you always encourage people to drink water, they might be sore cause you've released adhesions, that kind of thing.

So it adds like whole body relaxation, especially when you're doing all of that. Now, when you're doing focused areas around the shoulder and neck, it can still be like you did a focused deep tissue massage, but instead of passively just doing the massage to break up adhesions, increase blood flow, you're doing that manual hold and the person is moving. So you're still releasing and getting increased blood flow. It's just slightly different. So hopefully that answered your question. Let me know if I can expound on that, okay. So, thoracic spine, it's the link, it's one of those areas that is kind of hard to get to. It's stiff on a lot of people, but it's so important when it comes to shoulder, neck and low back pain.

So, we wanna kind of talk about this a little bit. So, we know that research has shown that if and this is not to say you have to do an HVLA. So HVLA is high velocity low amplitude manipulation, or basically a thrust technique of it, but it said, this study found that they had reduction in shoulder pain and increased range of motion immediately following that manipulation in the thoracic spine or ribs. So, hey if that's stiffing you can get an immediate response, great. Now in the pool, I'm not talented enough to do a manipulation of the thoracic spine in the water. There's a DO i know in Canada that I'm pretty sure can, but for me, I might do that on land. This is really just to reinforce you, get the thoracic spine moving. And we'll show you some exercises that

can be very helpful and beneficial in reducing shoulder pain and increasing emotion. The second study looked at shoulder pain, and it was kind of a clinical guideline saying, if somebody walked in, and they had three of the following things, so if they had, if their flexion was less than 127 degrees, if their internal rotation was less than 53, if the neer's impingement test was negative, if they're not taking medications, or the symptoms have been present for less than 90 days, they had three of these things, they were more likely to benefit from manual therapy of the thoracic spine compared to those that did not show up with this. So if you're not sure, and the person fits these, you might say, "Oh, I probably should really look at some manual techniques "for the thoracic spine." And if it was, oh, no, they don't have any of these, you may say, "Oh, I don't know."

So that was just kind of again, connecting the link between our shoulder pain and the thoracic spine. So, how does posture and alignment affect your mobility? We talked about how it affected muscle length earlier, we had the tight packs and the scalenes and the suboccipital muscles and the weak muscles, right? So now how does it affect your mobility? Well, let's ask Quasimodo, if you slouch, okay? And I'm gonna have you slouch and sit in your desk, or wherever you're sitting and reach overhead, okay? And then sit up nice and tall, good posture and reach your head.

Now I don't think I really needed a study to tell me that I'm gonna get 23.6 more degrees in arm elevation with good posture, but there it is, they did it. And they they told us that yes, they had that and also if they were slouch, they had a lot less posterior tilting, which is necessary as you reach overhead. So, just reinforcing why posture is important. And then these other studies on the right are just other studies that linked shoulder function and thoracic spine, and shoulder blade position, and that kind of thing. So we know that it's important to address. Okay, so effects of respiratory muscles and exercise on spinal curvature. So, teaching I taught a whole day class on thoracic spine for aquatics. And so looking up research on breathing and the effects of

the thoracic spine, and we found this study. Now these were healthy swimmers and they performed exercises 10 minutes a day, three times a week for four weeks. Now these respiratory muscle exercises were done on a piece of equipment that provided resistance for inhalation and exhalation. So it was definitely a piece of equipment that many of us don't have. But, regardless they found that it reduced thoracic spine kyphosis, and lumbar spine lordosis. So it improved those angles, and increased trunk flexion strength because forced exhalation you use your abs, right? Improved the pulmonary function. Of course, you would expect the vital capacity to be improved and forced expiration volume. So this kind of reinforced that, hey, this deep breathing can change the alignment just by improving the mobility.

Now, if you don't have that equipment, I thought, well, are there other studies out there that we could go on, since most of us don't have that resistive equipment. And this was a study that looked at and fixer trips, he is just deep breathing. And they found that repetitive deep breathing resolves stiffness in the ribcage, and straighten the thoracic kyphosis. So, for your frail individuals, though, people with osteoporosis and that kind of thing and you wanna move them and work on, but you're not gonna be doing mobilizations to that spine, because of the frailty of it.

You can try to work on that deep breathing, the diaphragmatic breathing, getting that ribcage moving can be very beneficial in helping with that. So you still have some techniques you can do, even if you can't put your hands on, or maybe you're not doing the hands on stuff, you're the pool therapist, or your PT assistant, and you're not doing spinal mobilizations, whatever the case may be, go to deep breathing, kind of use that in your toolbox. So we're gonna, I think we have the videos from this program, this home exercise program, and so thank you. So you can see that you can use manual feedback. Now, if your patient can't do the hands in that position, you can always put your hands there. I tend to do that, so I get an idea of where they're breathing, but to have them, press into the hands and breathe out into the sides. So really nice way to

get them to feel, get a little feedback to expand the rib cages out to the side and back. So again, you can, and we can go to the next one. You can put your hands there when necessary. And here's one that we might do on land to get the ribcage on one side, especially with that patient that had paralysis, or maybe a rib fracture history or something. And they're tighter on one side when you feel them. If you have them lay on their side on land, they can breathe in, and we're gonna show you how you might do it in the pool. But again, you can have them just put your hand on one side and say, okay, breathe into that. Alright, let's have you go back to the PowerPoint. Thank you for pulling those up, that was great.

And that is a program from a company called PhysioTech, and that's what we use in our clinic, and these guys have an agreement so we were able to show those videos, so that's great. So we use that feedback. Now I have a pair, I sometimes use a quick stretch so that in that top one, the costal breathing, if my hands are there, sometimes at the end of their exhale, I'll do a little very light little pressure inward and say and breathe in kind of like a PNF quick stretch. Of course, I don't do that with anybody with osteoporosis, pregnant because of hypermobility, and or any kind of root fracture. Here's a home program in that, sometimes we want, they can't get their hands on their sides just because their shoulders, their range of motion.

That's not that easy, actually. So we can take theraBand, or towel like theraBand 'cause of its stretchiness, put it around, they hold it and then they breathe into the band, and they can feel it. So you can use that as kind of a carryover for Home program. And teaching them to use that to keep going if they need that feedback to present, okay. So keeping the mobility. So there's a statement in manual therapy, at least in my world, move it move on, right. We don't need to manipulate and mobilize to death. Once we've got it moving, we want them to actively move and keep it moving. And so how do we do that? Now this is one of my favorite exercises on land as well, because it's sitting. So people can do it intermittently at their desk. I like to give it as

homework, every so often, especially for a computer worker who sit for a long time. But what you're gonna do and I'm gonna have you try it if you want, sit up nice and tall. Put your knees together and this is key, the knees have to stay together. So use those inner thighs, because that's gonna stabilize your pelvis and not allow your pelvis to twist and rotate and cheat. Then we're not really praying here we're just the palms are together, and the thumbs are on the sternum because you want the nose, and the the hands, and the sternum to stay lined up as you twist your body. So it's not the head turning, it's the trunk twisting. And really they should feel it in between the shoulder blades.

So I'm kind of twisting and you wanna stay tall as you twist. And you probably you can't see me, but I'm doing it now. So, a great little exercise to kind of keep that going. And the hands don't have to be palm to palm, they can be across the chest. It's just sort of a feedback to keep everything lined up and avoid the shoulders, them pulling their arms around to get more rotation. And you wanna make sure the feeling it in the right spot, if they're feeling in their lower back, they're probably not keeping their knees together. And if they're filling in their neck, they're probably trying to turn their head and they're not taking their whole body with them, or their trunk with them. Okay, so exercise for thoracic mobility.

We wanna get rid of this picture, oops. Okay, so things that we can do, and these are basically thoracic mobility exercises that I've modified are typical land exercises to the pool. So if you give yourself a hug you know that that brings those shoulder blades around and then you can stretch your neck down, and often that gets between those shoulder blades, right? We can do lateral and forward, side roll noodle on the deck, or push down through the water. So basically, if you think about it, modified prayer stretch. You've got your arms out in front of you, you're rounding forward to using the side you're getting that stretch, through the into thoracic flexion. And then if you wanna get one side or the other, you move your hands more to the right or to the left, right?

And that can be done again on the side of the pool, and that should not say side roll it should say, probably side of the pool my bad or the noodle. And self mobilization side bend. I'm gonna show you a picture of that in a second. Cat cow again, modified on the pool wall using those exercises as you already know, but you're in the water you can keep that going. Book opening side of the wall. So the leg that's closest to the pool wall is in the back, and your arm that's closest to the pool wall is along that side and you're just opening up into like a book opening, and that other arms opening up and stretching. So if you use that it's usually done in sideline on land, on a mat, but you can do that. Another really easy one is standing next to the pool wall, and the leg that's closest to the pool wall is now in front and you just turn and touch the wall with both hands, and that's just a nice trunk rotation.

Whenever you're trying to stretch the thoracic spine, you're always turning the body towards the side of the front leg. I guess that's kind of the rule. Because if you turn towards the leg that's behind, the pelvis tends to cheat and open up, and you don't get that stretch up into the thoracic spine. So that's kind of the rule when you're doing that, if you really wanna work on their balance, put them in tandem, and have them do rotations, trunk rotations in tandem and you get thoracic mobility along with balance work. You can do modified thread the needle. So if you know what that is, that's taking one arm and reaching under the other, and getting that twist and flexion stretch. You can do that on the pool.

Again, if somebody has osteoporosis, you're not doing flexion and rotation combined. We wanna work more on extension mobility, right? So hopefully that made sense, especially if you do those on a regular basis, on land, the reason I put these in here, is not because I've invented anything new. It's to remind you, you have a lot of tools in your toolbox. You just have to think, oh yeah, that can be done in the water, they're getting the support of the buoyancy, but I can still get that mobility. Alright, so the side bend. When people side flex, and I apologize, I should have had him take his shirt off.

But when people side bend, you should have a nice reversal of curvature here. You really wanna see thoracic spine flexing. So often people will hinge at their lower back, they might even have pain. So how do we get it to bend up here? Well, we can stabilize in the mid thoracic spine, either have the patient do it, or you can put your hand there and have them bend, kind of up, and over to kind of get that stretch in that mobility. You can add deep breathing so that as they inhale, this kind of, the air goes into that upper, and it's gonna mobilize this side of the ribcage, and thoracic spine a little bit more. So lots of ways to to get that mobility going. So, we're gonna show this video, and now you're gonna say, well, what if those people they can't stand, you've got that person. This is a kid that is incomplete quadriplegic. So he has a little bit more tone on his left side, which you can kind of see by his arm.

But yeah, very stiff spine, because of some paralysis as far as his diaphragm and things, but you can do that snaking through the water. And kind of think about how that works. And I will tell you that this video quality is my fault, 'cause it's an older video, so it's not your screen, it just tends to be, it's an old video, so it slows down. I'm working on getting some updated ones that work a little better. But this is just, he's really somebody that I can kind of demonstrate that tone and somebody that wouldn't be able to do the standing one.

So remember those supine techniques of side, side to side. I will try to point out if you do supine work, the thing you wanna remember is when you're snaking somebody, your head and chest, you wanna try to stay lined up with them. Because so you can see that I'm pivoting through the water turning my body. If I right there, I lose it, and be if I don't keep this lined up, the drag force isn't as effective. So and and the drag force is what we're using here, to stretch the side, right? We're using that to stretch the sides. If I stand lined up here, and it's a core workout for me as a therapist, but here, oh, I lost it. And now there's not as much drag force, he's sort of swaying in the water, and I catch up and I get to get the stretch. But something to think about because that's

probably the biggest mistake I see people do, when they're doing the supine snacking. They lose that connection. Okay, let's go back to the PowerPoint. Okay, now, let's see we've got stability. So we've been talking about mobility, and if there questions so far on mobility and then we'll move into our stability stuff. Thinking about postural stabilizers and co-contractions, we're really trying to get scapular motor control and the deep rotator cuffed stabilization, being able to keep this shoulder blade in place or down and not elevating too much. And of course, those thoracic spine, spinal extensors as well as your mid and lower traps, stratus interior, but think motor control versus stillness.

We are meant to move. And so really when we say stability, I don't want you to think rigidity, we really need to be able to move around. And that's very important when it comes to the shoulder blade. If, for years, I would write, shoulder stabilization, or shoulder blade stability exercises, and I'm like, well, really, it's motor control. I don't want that, I don't want the shoulder blade moving all over the place, or in the wrong direction, but it has to move for normal motion of the upper quadrant, right? So thinking about that, that you're like, oh, okay, maybe I need to think about it. Is it stable in the right direction versus totally stable or not moving, right? So let's start with the neck flexors, the deep intrinsic neck flexors.

So you've got the longest capitis, the longest cool lie and that kind of thing. But basically, what do these deep neck flexors doing, and why we call them deep or we call them intrinsic muscles? They're local, they're close to the spine. Here's a muscle that's not your SEM that is not an intrinsic muscle, and it tends to shear and pull the head all over the place. But how do we counteract that? It's these deep muscles that go along the spine. They control what's called cervical flexion with sagittal rotation, and that's a fancy way of saying segmental flexion, the sagittal plane flexion is we have cervical flexion, in where we bend our whole head, we have like that global flexion. But if you think about it at each individual segment, you don't have that one vertebrae at a

time. And that's where these deep muscles come into play. And it's important for the stability and the inherent control of our neck, and so that we don't have shearing and compressive forces. We know that research has linked the, significant decrease in strength and endurance, and these muscles are linked with chronic headache, and neck pain, So it's something we should be working. Now, here's a sort of a picture of it, and it's something that you can think of, as here is our spine vertebrae straight up and down. Now here is our spine without using those deep intrinsic muscles, and here it is with. So if we flex our neck without it, oh, we've got a lot of shearing compression, those blocks are moving all over the place here, if not, it's staying nice and evenly spaced. So how do I describe this to patients? because it's hard for them sometimes to understand, why would we have to do these simple baby exercises? Why is it important?

I need to do heavy lifting and really work out, right? Well, I describe it as these muscles are your internal duct tape. And I say and if I take this spine model, and I show him the spine model, I say I just flip this around. Well, it's gonna stay together, ' cause there's a wire going up the middle of this fake spine. But you can see what's happening to all the vertebrae. They're moving around and the joints are not as stable. But if I take duct tape and put it along this spine model they can see and most people know what duct tape is.

They can see how, oh, yeah, that keeps it lined up, and a little bit more in control. So that's one of the things I used to describe it is our internal duct tape. So hopefully, you guys have ways to describe that as well. So how do we strengthen them? So we're gonna do a virtual exercise here. What I want you to do is try to sit up nice and tall, if you can get to a wall and still hear me and listen, and get your back against the wall, your shoulder blades back against the wall, and if your head can go against the wall and keep your spine in neutral, great, if not, don't force the head back. But if you're just sitting or if you're lying down and listening to me, this is great. You can have your head

in a neutral position with a towel under your neck. But I want you to put the tip of your tongue on the roof of your mouth and you're gonna keep your mouth closed. You don't have to show anybody the back of your tongue, but that's where it's gonna be. And then what I want you to do, is just do a simple head nod, where your chin is coming down and you're lengthening the back of your neck, you're not looking down, you're just lengthening. So it's Upper Cervical flexion or axial extension, right? And just watch for substitutions, kind of feel the scalenes, and the SEM, and the big global muscles in the front of your neck, and see oh, are they firing?

Are they activating? And if so, try to mentally get them to relax and feel the deeper neck flexors. If you're doing it right, you'll feel as if there's some light pressure around your Adam's apple. So that's what I tell people, if they can feel it in there, they're doing it right, it's not a big movement, right? So thinking about that now, how do we use this in the pool, we might just do this exercise until they learn the head position and that kind of thing, but we also, we'll have them kind of hold that gentle nod with other exercises, while we're doing core stability, and arm movements, and things. I have a slide a little later to talk about that. But just kind of thinking about that's how you can integrate that into your pool program, is just making sure that they're activating those and keeping their head in alignment.

What happens, you tell people to stand up straight and they jack their chin out and arch and extend their neck. And you're like, no, no chin down, eyes level is a good way to do it. Ears over shoulders, you don't want that severe chin talk. But keeping that nice and long, I like the term long in the back of the neck. So thinking about how you can do that, okay. And there are ways to measure this. You can just do a test with a person supine, and they they do that nod, and then lift their forehead. So they lift the weight of their head up and you time them for how long they can do it. And then there's also, if any of you use the pressure feedback mechanism, the feedback device, either a blood pressure cuff, or the the name brand item, the stabilizer, you can

document how long, how many repetitions they can hold at a certain poundage. So if you have that, then you're probably already using that. That's a land based thing. So just getting that head done. Okay, so now we've got the shoulder blade. Getting those deep neck flexors activated, we gotta do the shoulder blade. Well, it elevates, depresses it forwards and backwards, upward rotation, downward rotation, internal rotation, external rotation, tipping. It goes all over the place, right? So that's one of those things that, like I said, it's supposed to move so we wanna allow it, we just have to control it. But let's talk about that how many muscles attach to the shoulder blade, right? Surprisingly 17, okay.

So that's a lot of muscles flip, pulling and influencing the shoulder blade position. Now I will tell you that I'm one of them is the homoioide, and so we probably don't think about that very often. But there's you've got a few fibers of the lats the Terry's minor and major the Emperor spin Addison, supers finatus, the deltoid, the traps, the levator, the rhomboids, the subscapularis, the biceps, the triceps the Rattus interior, that coracle brachialis and the packs. So there's a lot of things going on there, and the term that we use often in therapy when the movement isn't quite right is scapula dyskinesia symbol, we'll have a slide in a second, but shoulder blade control. How do we get that? Because we want it to move, but we want it to stay moving in a controlled pattern.

So getting them starting in the right position is one of the first things. So get, I call it setting the shoulder blade, and what happens, you tell them to squeeze their shoulder blades back and they squeeze really hard and their head comes forward and the tension goes into their neck, right? So, or they'd have no idea how to retract their shoulder blades, so they deduct their arms and squeeze and nothing happens at the shoulder blades. So I think setting the shoulder blades before. So I usually get started always with good posture. So correct the posture and then say okay, I want you to gently bring the shoulders up, and then move them back and then finally relax down.

And that's where it's a good place to start where the shoulder blades should kind of stay, especially in the pool when you're doing upper extremity work. Because we're doing it mostly 90 degrees of elevation and below, we're not reaching out of the water, if we're vertical. So I remind them constantly, that's where they should start up, back and down. Also the relax down instead of pressed down. People tend to over depress their scapula and really reach too much for that shoulder blade to calm down. So we wanna make sure that they're just relaxing down and not driving down, because if you're over depressing, they're gonna say, hey, my neck hurts, because now the upper trap is being pulled down and compressing the vasek joints. So thinking about how that plays a role. So scapular dyskinesis is that fancy word for basically shoulder blade isn't upwardly rotating or moving quite like we want to, it's going up too much or it's not going up enough. All of those things.

So you can say,"Oh, well this is happening." But then you have to figure out what muscles are gonna work to correct that? How are we going to fix it? So and that's often a lot of queueing and working our lower and mid traps, the serratus anterior, and then stretching out the levator, because of where the levator scapulae in the neck is attached to the scapula tends to downwardly rotate the shoulder blade, so that has to be stretched out. So that the stratus anterior can upwardly rotate the shoulder blade, okay. So what does the rotator cuff do? Well, it rotates the humerus in throwing activities, but really what does it do? It is the stabilizer of our humeral head in the glenoid. It keeps the ball in the center of the socket, and it's essential in impingement, in that if that person has it, there's two types of impingement, right? We've got the primary where it's a tight joint, and maybe they've got a bone spur, and it got on there, they have a stiff joint and it's not moving very well. We've got to mobilize it and stretch it and that kind of thing. And then there's secondary impingement, where they have a sloppy joint, they're loosey goosey, but the rotator cuff is not stabilizing that humeral head and it's going all over the place. And then the ball is just sliding up in the socket and pinching the structures in the subacromial space, and so for there's two different

treatments, the treatment for the secondary impingement is obviously going to be that we've gotta get that motor control, and teaching that rotator cuff, and keeping the the stability first, we're not gonna be trying to stretch out in already loose joints. So that's something that we wanna think about. And we have to kind of queue and teach that person to maintain the correct movement patterns that I alluded to earlier, the PICR, are basically keeping the ball spinning in the socket and not letting it move all over the place. Now in the pool, what happens buoyancy pushes the arm up a little, so they actually have to use a little bit of active scapular and humeral depression to keep that the shoulder in the right place.

So just realize that's nice, but then if they get really fatigued, or if they have a really bouyant arm, it may actually be really hard for them to do that in the water. So just kind of keep an eye out for that. So here we're gonna show this video, and it's, basically elevation and depression. And this noodle is one of this, so the dense white noodles that's really hard to hold down. It's a lot of buoyancy. So if you're somebody that has used this, you know that this is a pretty buoyant of noodle. We, this is a healthy therapist that has good control. So she's demonstrating how you can use buoyancy to practice resisted depression. Our patients, we might take one of those noodles that's thinner, has a hole in the middle.

Maybe it's my waterlogged noodle, that's not as buoyant to start, or we cut them up in smaller pieces. So remember, you gotta kind of have some things of different levels of buoyancy depending on your clients. He or she's trying to do a functional kind of switch over, keeping the shoulder blade down, and in the right position. So thinking about this, these are great little techniques. She's gonna do some forward and back end circles. And keeping that humeral head down away from the chromium and doing this. Now, before we get to this point, what do we have to do? Most of the time in impingement they have that tight shoulder, anterior shoulder, right, and pack so we're gonna be stretching the front. And then we're gonna be here she's gonna be working

her lower in mid traps, it's actually her lower trap, and the depressors to keep the shoulder down as she moves the humerus around a little in different motion. So thinking about that now, there's the cheat. We don't want people if we're working on... Okay, I think we're back. That was a nice little interlude. So hopefully you guys heard me up until the point where I said, the cheat where she kind of side bent into the noodle instead of keeping her spine level. So, thinking about that when you're looking at someone, don't let them kind of lean down, if you're focusing on that scapular depression, make them do it from there. One of the cues I use is that you are pretending that you have your favorite beverage on your shoulders, and you don't want to spill them.

Okay, see can I, there we go. So, other things we can do on the pool and rhythmic stabilization, basically isometric holds using the drag forces to be your resistance. So, let's see here. So for those of you that use the i's and t's and y's over the ball or on your stomach on land, for this shoulder blade stuff, guess what? Do this in the pool. So here I've got myself in a low y, or an upside down y, right, or a low t?. My thumbs are up. I've got my shoulder blades down and back and I'm gonna walk backwards.

And I'm gonna keep my arms right here, drag force is gonna try to push them forward. And voila, I'm gonna get some some activation of those posterior muscles, and the lower and maybe some mid trap, while I do it. So remember, the pool is your tool, the drag force, you can use that to help you. Now if you don't, I have a 25 yard length pool. So I can have somebody walk pretty far and get up to speed. But if you don't have a pool that's that long, or you have a small space, or the person's fairly short, and they're almost neck deep in water, and they really can't get enough traction on the bottom of the pool to move fast. You can stand there and push the water at them, so that you're creating drag force and have them hold it or if you have a pool of jets, you can turn on the jets. Just be careful how heavy those jets are. So and then these ones here, I am kind of trying to demonstrate, basically I'm keeping my shoulders in a flexion to 90

degrees, and I'm moving my body side to side here. And keeping my arms still just like that isometric rhythmic stabilization that you might do on land manually, with somebody. So, you can also do turbulence. Push the water around their arm, if you're in the pool with them. So lots of different ways to get the same thing done. Alright, so, closed chain and kinetic chain stability. We know that closed chain helps get... What do you call it? Encourages rotator cuff and scapular muscles to fire simultaneously. So we get that kind of stability. It integrates core muscles, which are important in controlling forces, especially through the upper extremity with sports and overhead swinging, but just think about the things that we do functionally, push pull, we got to use our core toO. So it promotes that joint proprioception, and that in turn will decrease hearing and translation, and distraction forces at the shoulder.

So we don't wanna forget the clothes chain activities, the poster glide that it provides for the humeral head, especially against the pool wall, can be nice if somebody has a tight posterior capsule. So you're getting kind of a little bit of a posterior glide this way of the shoulder, while you're doing it. Be careful, watch out for that elbow hyperextension that I'm demonstrating here. And also watch the back of the neck. If you're standing on deck up here, they're gonna wanna look up at you. So make sure you tell them, keep your eyes right between your hands, so that they keep that neck long and they don't compromise that. So that's just, okay. So now, stability with mobility. Well, we can do just holds and plank kind of things. And then we can do some, starting to do some lift one arm, but now we've gotta get into being able to keep those shoulder blades out of our ears, right? And moving correctly while we do things like push pull, push ups, this is a picture of a noodle press down, so you're just holding the noodle and pressing it down. And I think we're gonna have some videos in a second. We wanna start doing, we did that head nod with the tongue on the roof of the mouth earlier. So you can keep that head nod, keep the axial extension, kinda hold it and then do various movements. So these are pictures demonstrating some different movements and kind of, on land we might do, what do you call it? Sitting on the ball

posture and arm reaches, here supine, doing the arm reaches overhead and making sure you can't see your head hiding behind your arm, but keeping that chin nod, but here against the pool wall, really being aware that they keep that position, the shoulder blades, are back the ears over the shoulder. The eyes are level, and you're doing different arm movements. So flexion extension, this is a windshield wiper exercise. A lot of different things that you can do, all this basic arm movements. And don't forget, they gotta have their abdominals engaged and not have a big arch, or their hips away from the wall. So this is a great spine stability exercise. And one of the things I wanna, we're not talking about lumbar spine stabilization.

But I gotta tell you, if you don't know what to do with the neck patient, I would start in the pool with these basic against the wall spine stabilization exercises with the arm movements, because if the pelvis isn't in the right position, then the head and neck are never gonna get in the right position either. So a lot of people need that whole core strengthening especially with chronic neck pain and positioning, and if they're real, acute and aggravated and irritated in the neck or shoulder, and you wanna be like okay, I don't wanna aggravate that, I want this to be successful, go down, work on some spine stabilization in core really lightly, and that that can pay off.

For those of you that do manual therapy, and you've ever done some manual therapy, and every time you even lightly touch them at their neck, they come back worse, that's a back off with the hands, and work on these head nods, and the spinal stabilization. Because that's what they need, their body is craving some stability, not more manual work. Okay, so we're gonna show these videos and these are newer videos. So they should play a little smoother for you guys are done on the mp4. So here I've used my noodle is my foam roller, and I'm doing my isolated scapular protraction, retraction, right. Not easy to do for people, they tend to bend their elbows and flex back or they tend to push their head forward. Now I've got my shoulder blades pinching or squeezing into that noodle, and I'm gonna do my flexion and extension. I'm gonna

pause this here for a second. And I want you to notice what my arms are doing when we do this, that thumb up is slicing, and so less work, or when we're going back, now I'm getting more drag force. When I was going up and down, I was slicing up and pressing down. So just kind of remember, if you're trying to strengthen one thing more than the other, that's what we wanna do. And of course, the pecs are always usually stronger. So I usually try to minimize the pressing forward. And I'm thinking about turning my thumbs up and back. So play that one more time. So, thumb up and then just kind of protraction retraction, getting that position sense, and then learning to squeeze that shoulder blade back. And then once I keep it there, I'm gonna go into my flexion and extension.

I'm pressing down with wide hands, and then slicing up that keeps it, so I don't overwork my... I don't give too much resistance to the flexion, I'm really focusing on the pressing down. And now the horizontal AB and AD deduction, you'll see I slice forward to keep the chest out of it. I'm really working those retraction kind of muscles, making sure that I'm actually using my scapular muscles and not just humeral head or humeral extensors, or horizontal AB doctors, okay. Now we'll go back on, go on, let's see. I think it goes to another video, yeah.

So like that one. And this is now using the noodle and you'll see that I'm kind of setting my shoulder blades first, but then I'm doing isolated protraction and retraction first just supported by the noodle. And then second, now I'm pushing the noodle down a little, so that's a little bit more work. I gotta hold my depressors down and the scapula down, as I do that, so I've set my shoulder blades. And now I'm just practicing protraction and retraction. I'm gonna keep that retraction. And then I'm gonna do a little pressing down. And then holding that retraction, I might do elbow flexion and extension, and really work that. You notice I'm not pushing that noodle way down, and again you might use a lighter buoyancy noodle for this type of activity. And let's see, what we're gonna do is skip the next video 'cause that's a repeat of one we did before and go to

slide 74's video, if we can. I didn't catch that, I got that in there twice . Okay, so here you can see, now I'm doing a full noodle press down and this is a core workout 'cause I'm keeping my spine stable, by using my abdominals and obliques. And then, but I'm also keeping my shoulder blades down. You notice my shoulders aren't popping up towards my ears, I have to work hard not to let that happen or to keep this form. So recognize that you wanna preemptively strike with the cueing and let people know, oh, wait, don't be doing that, because we don't want that to pop up. So again, changing the noodle buoyancy level, it may be appropriate, okay? Okay, let's see, let's go back to the PowerPoint. Perfect, let's see, we'll go along here.

And voila, okay. So, I think it's important with shoulder work that we really do get our hands on that joint and feel that it's moving correctly and in alignment, whether it's in like this position when they're doing a wall push up position, especially if you're working with neurologically impaired patients with strokes, with subluxed shoulders, you want that shoulder to be in a good position. Now the nice thing is, if they have a inferior subluxation because of spasticity, then the buoyancy of the water actually helps push the arm back up into the socket a little bit, and could be very supportive. If it's because of spasticity and it's going superior and that kind of thing. It's a little bit more challenging, but getting that on feeling that the shoulder joint is moving that correctly and stable, that you're not getting too much motion of the humeral head and not enough of the of the scapular motion, that kind of thing.

So, kept those hands on and feel it once in a while. So you really know, you know what's going on there. Okay, so skill in integration. It's the whole body, right? So we don't just use our arms and isolation and function, we use the whole body together. So how can we implement some of this progression? We've done our mobility, we've done our stability. We've done some stability with mobility just now, and now we're gonna kind of talk about that integration. And so one of the things I'm gonna point out is a term called regional interdependence. And we see this often we tend to, I tend to look

for it more, I guess, when I see an athlete, a throwing athlete, that kind of thing. We know that pitchers, or throwing athletes that have a sick scapula, they have... the scapular mobility is off, their rotator cuff is weak, they might have some impingement. They often have a weak hip on the other side, so we can't forget the rest of the body, but what we can do in the pool is really integrate some things. So here he's doing a lunge forward. But as he does, he's pushing that kickboard forward, protracting the scapula, and then when he comes back, I'm having him retract, reaching, turning his trunk and standing back up. So this is where we were starting with kind of getting that whole body movement, and not just isolating one thing at a time.

And so I think it's as important with our general population, it doesn't have to be athletes, they have whole bodies. And the person that doesn't have good core strength, and can translate the power that they need to push or pull from their legs through their core, to their arms, they overwork their arms, right? And then they have these upper quadrant problems. So it's not like we're treating a body part that's not part of the diagnosis, right? Because it's the whole body, and it's going to influence it. So kind of remembering that.

Yep, sorry Holly, I missed that question. Our pool rails are underwater, through most of it, and where there are no rails, there's a lip that comes out over the water, so there's no flat wall space. Do you have a stick suggestion on how to do these exercises? So Holly, I'm assuming you're talking about back where you're leaning against the pool wall. This is common in a lot of places. So if you have a lip and the head can, then the lip is not too deep or too pointy, you can sometimes let that go right where the curve of the neck is. Otherwise, you might have to be creative, if you have a horizontal bar, like some people have parallel bars in their pool, you can kind of use that. You might just have to have the person's it, what we call mid pool, where they're not supported by the back and maybe you're supporting them, or have them sit if you've got a bench, have them sit down and kind of, you're gonna have to give them some feedback, if you don't

have that pool wall ability. I suppose you could always do back to back, you could put your back against them, and they could lean on you as the wall, but then it's gonna be hard for you to see them. So, if you got a group, maybe that would work. Hopefully that gave you some ideas to think about, how to get those in, and if I'm misunderstood, let me know. Okay, sorry, I was delayed in answering that question Holly. Okay, so stir the pot. Well, what is he doing? He's holding a dumbbell down underneath the water, so he's got to depress, and then he's gonna make circular motions like he's stirring the pot, or making grool in a big pot. And you can do it clockwise, counterclockwise. You can do it stable. Here, this is also a core workout, or you can have him... The patient can stir the pot by lunging side to side and using more of a dynamic movement and control. So coming up with a variety of different things can be helpful. Alright, so some deep water ideas.

Let's see, well, let me get my little cursor here. Dips, so here I'm doing dips in the deep water, while I gotta make sure my shoulder doesn't come up towards my ear. So both, this is a consideration if you're working with somebody in deep suspended water exercise, and they've come in for a back problem, the last thing you want is them to leave with a shoulder issue, or impingement because we didn't keep an eye on this. Okay, so you know, you got to be careful how heavy the dumbbells are. And if that exercise, if they can control it. Whether they're deep water or shallow water, but especially in that deep water, and one of the key things in deep water is to make sure that their shoulders are just above the water, you have enough flotation. If they're sinking, then they're gonna be automatically in an impingement position. This exercise is called a pendulum. The person reaches one way and the blades go here. That's a lot of shoulder abduction. So great if that's what you're working on, but again, caution with that. This is a nice little exercise. You can do it in shallow or deep. I'm sitting on a wonder board I think here, and I'm doing a hurdler stretch. So basically, I'm reaching out, turning my body, reaching my arm, nice integration, thoracic mobility, arm reaching, trunk stability, hamstring stretch, all of that, so you can put some pieces

together, and advance somebody instead of just kind of the same old, So we talked about push pull. We've gotta work push pull, right? It's functional, here's a one of my colleagues, her grandson is helping out grocery shopping. But what do we do? That's something functional, we push things, we pull our, we push our grocery carts. Here, I'm pulling luggage along the train station, and how often do we do a good job of keeping our arm aligned and not to mention I got a heavy backpack on there. So thinking about things that we have to train, and we have to be able to use our core for this as well. So you can, one of the things I've done is use a PVC pipe from Home Depot. And you can they can push and pull that through the water.

You can add manual resistance to it. And have that you know be the the resistance, or there's some other pieces of equipment now that are these longer dumbbells that aren't made of foam but are drag force. So there's some options out there for push pull, but you can just have them push into you and push you across the pool. So thinking about about that, okay. And we're gonna show this video, again, this is just another integrative exercise that's really nice.

And basically what she's gonna be doing is scapular depression, so she's sitting on the barbell, and now she's done scapular depression, so her butts no longer touching the dumbbell. She's bicycling forward, and she's got to keep her trunk upright. So she's trying not to tip forward. And she's keeping that scapular depression and dynamically moving her leg. So this is a pretty hard exercise to keep everything up right now. The belt that's on her is a floatation belt. And because of its location, the foam does wrap around her a little bit. So it's not too bad. But if it was one where the foam was mostly in the back, she'd really have to work hard, because the buoyancy would be tipping her forward. So recognize you can take some of your higher level people and work some things, get some cardio and get some other activities going at the same time. Okay, let's go back to the PowerPoint. I apologize, I think the next slides are videos, so if we can skip to that, that would be great. So here's me doing stir the pot with a little

lighter foam, so keeping that stable and going in different directions. And then I can then start to move my body, and really get sort of that dynamic. So now I got to do two things or three things at once, which can be a little more complicated, but it's certainly a lot more functional. We usually don't tend to stand in one position, while we use our arms. So I think that's a nice thing. Now here, I can do both hands, right? So getting a combined thing, I can now add balance into single leg stance. So now it's gonna be harder for me to keep my shoulder blades stable 'cause I'm trying to think about staying upright. So get creative and add more body parts in there as they gain control of things.

Okay, we go back to the PowerPoint. And we going to talk a little case study, just to kind of reinforce, and I've kind of talked about this as we were going along, but I realized you weren't seeing the slide, so let's talk about. Okay, we've got this patient with secondary shoulder impingement. So remember that's the person with the sloppy joint, their humeral head is moving around, they don't really meet end range stretching, we wanna avoid over stretching, right?

So if they've got a tight pec, we can stretch it, but wanna make sure we're not stretching the joint capsule, because that's gonna be something we wanna avoid. And then we wanna use active range of motion with the humeral head stability focus. So we wanna make sure that keeping that ball in the socket, so even if it's just simple internal and external rotation in the water using light drag force, right, lower and mid trap isometrics. So we talked a little bit about that, but you could have them with their hands at their side and walking backwards. Remember, if they walk forwards, they're now gonna be getting resistance and to hold their arms they're gonna be using their pecs. So if that's already tight, put the arms down at the side for walking forwards and when you're going backwards, that's gonna be working those posterior muscles that were so often trying to work on. Using the buoyancy equipment when able to control that upward movement so that they can use that scapular depression and also kind of

ease centrically control the upward motion, not letting it just pop up to the surface of the water that they're really kind of controlling it. So that's kind of how you can work some of those on impingement, you can then say they've got the rotator cuff, you're strengthening that you're doing internal and external rotation, and they finally can do a little bit more without pain and good motion. Remember to add that what do you call it speed first, try to speed it up first. See if they can do it a little faster rate, still have the control and with the increased resistance not have symptoms return. Then adding drag force type of equipment. So remembering to kinda go and use the water first and then you can start adding some equipment.

Okay, so questions? What's still vague in your mind? Or are there some specifics? Did I miss anybody's questions that were posted. Give me a second. I think the biggest thing when we're thinking about upper quadrant, and what you guys are thinking of questions is that people tend to, they have bad posture anyway, no matter what we're working on. Somebody that's had a total knee, they've been using a walker for a long time or cane, they're rounded forward.

So all of these techniques are actually great for no matter who you're working with, because we wanna try to, yeah, we can't get your walk in again, if you're rounded forward either. So don't think of it as just the person with the upper quadrant diagnosis, but also the whole body approach. And then hopefully you guys have been able to find some ways to bring this in to your own ideas and say, oh yeah, this person would be really good for the pool, I can address some of the shoulder, or maybe there are multiple body parts and you're like, oh, I can address the shoulder a little bit in the pool and speed along their process and get some good outcomes. So I will say if you want you can go to my website, and you can click on either the Instagram or Facebook link. I do a water workout Wednesday, post every Wednesday, I'm not selling anything. You guys are welcome to look at it. It's just sharing ideas of water exercises. Sometimes it's a little bit of, hey, this is what it's good for. Sometimes it's very much a specific

exercise. So I just tell people, feel free to check that out if you want to get some ideas, and if you have some, share them, that kind of thing. No questions, I was that clear? I feel like there should be...

- Just a reminder how to use that question answer pod, go ahead and place those questions in, and then hit the send button. And also if you have any questions about the quiz or anything cleared up if you want Beth to repeat anything, go ahead and place those in there as well.

- [Beth] So hopefully I reinforced that thoracic mobility is important in the upper quadrant. Both for reducing neck pain and improving range of motion both to the shoulder and neck, and that we don't wanna leave that out in our plan. And that quality of movement is important. Just doing the exercises is not gonna be as helpful for a patient especially in the pool. You can use that buoyancy, but you also have to make sure they're controlling the motion up and down.

- [Calista] Okay, I do have one question. And it is sort of related a bit, if you have somebody that's fearful of water bath, and then so then automatically, you don't try to hold on constantly, and you want them to work their arms or what not. How do you go through of trying to quiet that down? Or is there any techniques or anything that you know, that you've talked to them about, or how do you go through that so you can ultimately work on their upper quadrant and not have them trying to hold on for dear life.

- Right, yeah, it's one of the things that people don't always tell you, they're afraid of the water. And of course, sometimes patients are sent to us for pool therapy by their doctor and their doctor says, oh, I'm gonna send you for water therapy. And the patient doesn't tell the doctor, well, I hate the pool, I'm afraid of the water, right? And so you get them in the pool. And you bet and we always ask, Are you afraid of the water and if

they say no, we're like, okay. And we did have a patient once that was death gripping the side of the pool, couldn't relax. And I kept saying, are you sure you're not afraid of the water? And eventually, we discovered that because she said no, No, I'm not afraid of the water. She eventually said, oh, well, she was afraid of drowning. I didn't ask the question correctly, right? She wasn't afraid of water. It's like a glass of water. But to us, so you do you get those outward signs. You get the big eyes. You get the, they don't wanna move further, or deeper into the water, and I think the biggest thing that has to happen is you need to be in the pool with them. So if you're in a small pool or you've got several patients going and that kind of thing, it's gonna be hard to get that person to relax if you are not physically right there for them. And then I think giving them, getting them away from the side of the pool, you can have them lean against the wall, if you've got the right wall to do it, but giving them maybe a noodle or something to support the arm so they still have something to hold on to. Getting them to learn that they can control their body and upright, you're not gonna put this person necessarily supine, but just getting them to feel the water and feel that they can control the motion. So more weight shifting.

Even if they have to hold on to you or the the wall. Be careful that you're not in deep water and they're holding on to cause if they panic, they'll grab onto you, but more you know lightly touching your shoulders, that kind of thing. And just having them breathe and saying, okay, let's see how we do, and then maybe put one arm in the water and let them hold on with the other arm and then slowly getting them to where they feel comfortable. If you're working on upper quadrant and you're in the pool, you can always stabilize at their hips to kinda help them stay stable, so that they don't, if they're feeling like they're tipping over, and that's panicking them kind of you can provide that extra stability. Another perk if somebody is really tippy and all over the place. Another trick is if you put a weight belt on them, or around their waist, that can anchor them a little bit too to kind of help with that. So that sometimes can help but I think sometimes it depends and if you can't get past that, sometimes we have to make

that clinical decision, okay, we're not being effective in what we need to do. Maybe we need to do more land based treatments, but again, just that slow reassuring convincing them. They don't have to put their face in the water. We're not trying to teach them to swim. So ideally, if you want, if that's the goal, then you know you're gonna work towards that. But I think first just saying, we're not going under, you're standing above water, we're gonna stay right here. Or maybe just have them sit, if you've got a bench, you can have them sit down. And maybe that'll make them feel more stable, relaxed, and in control, so kind of thinking about it. Hopefully, I gave you some some ideas of how to help that person, that's really fearful.

- [Calista] Definitely, all right. Well, I believe we're gonna wrap it up, today's class. Have a great day, everyone and thanks again, Beth, for sharing your expertise with us.

- [Beth] No worries. Thank you.

- [Calista] Have a great day, everyone.