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The Three Rotator Cuffs of the Body

Most of the general population is familiar with the rotator cuff of the shoulder and its importance to shoulder function and stability. What most people do not realize is that there are actually three rotator cuffs in the body. The first is the aforementioned rotator cuff of the shoulder made up of four primary muscles. The second is the rotator cuff of the hip made up of 8 primary muscles. The third rotator cuff is that of the spine made up of three primary muscles. All three of the rotator cuffs serve to stabilize the respective region and body part while larger muscles move the joint. These "rotator cuff" muscles are the foundation of the body's stability system.

The rotator cuff of the shoulder tends to get a great deal of press primarily through sports news outlets such as ESPN. When a famous professional athlete has an injury to the shoulder's rotator cuff, it is reported in a nanosecond and millions of people are informed instantaneously how that injury will affect their favorite team or – worse yet – their fantasy team. The four rotator cuff muscles of the shoulder include the supraspinatus muscle, which is the topmost muscle and helps with lifting the arm to the side of the body. The infraspinatus and teres minor muscles rotate the shoulder out to the side, and finally the subscapularis muscle rotates the shoulder inward towards the belly. The most commonly torn rotator cuff tendon of the shoulder is the supraspinatus. Over the age of 60, the frequency of subscapularis tendon tears increase.

While the shoulder and hip are both ball-and-socket joints, the shoulder joint is quite shallow and subsequently has more mobility, but it also relies on the rotator cuff more for its stability. The hip, on the other hand, has a deeper socket and therefore does not need to rely on its muscles as much for its stability. Because of this deep-seated structure, the hip is also limited in its mobility.

The rotator cuff of the hip is made up of 6 external (lateral) rotators: piriformis, superior gemellus, obturator internus, inferior gemellus, obturator externus, and quadratus femoris. There are also two main muscles that lift the leg to the side of the body: the gluteus minimus and the gluteus medius. These two muscles are analogous to the supraspinatus in the shoulder. The strength of these muscles is important not only in athletics but also in daily life. The rotator cuff of the hip provides stability when we walk since, at any given moment when we walk, we are standing on one foot. When these muscles are strong, they also help prevent falls, improve balance, and prevent fractures of the hip. They are also important for basic movements such as lifting the foot to put on socks or tie a shoelace.

While the spine is not a ball-and-socket joint like the shoulder and hip joints, it still has the ability to "rotate". Rotation in the spine is much more complicated than the hip or the shoulder joint. Since the architecture of the bones is not round and is multi-segmental, each segment only moves a few degrees. However, when we add up the motion for each segment, it allows us to do things like touch our toes. All of this mobility must be balanced with dynamic stability provided by the "rotator cuff" muscles of the spine. There are three primary muscles that traverse the length of the spine in some form. The multifidus, semispinalis, and rotatore muscles are in pairs at each segment of the spine. The larger muscles of the core (abdominal obliques, transverse abdominus, quadratus lumborum, etc.) actually perform the movement of the spine. The rotator cuff muscles are contracting underneath the larger muscles acting as guide wires to control and direct the motion. The rotator cuff of the spine has the largest influence over our basic movement patterns. For example, when you reach for your cup of coffee in the morning, your brain is telling the spinal rotator cuff that it has to contract prior to moving the arm in the direction of the cup. This segmental contraction provides a stable foundation from which the arm can work. When someone experiences sudden back pain picking up something trivial such as a pen or pillow, it is usually because the spinal rotator cuff did not contract until the motion had already begun.

It is an important injury prevention strategy to strengthen all three rotator cuffs of the body. The spinal rotator cuff first, then the shoulder rotator cuff, and finally the rotator cuff of the hip. In the end, we need a healthy balance of strength, stability, and flexibility to maintain the overall health of the body's joints and adjacent structures.

Article by Dale Buchberger, DC, PT, CSCS

Exercise of the Month: Prone Bilateral BB1

Ball Table start and end position (top), exercise position (bottom)

Ball tables are a great exercise for improving posture and for strengthening your glutes and core muscles. When added to your daily exercise routine, ball tables will help to prevent lower back and lower extremity injury.

Start by sitting tall on the ball with good posture and with your feet on the ground (as shown in the top photograph). Walk your feet forward (not shown) and lower your body onto the ball *without* using your hands, all while rolling the ball up your back toward your head. Stop when you feel the ball between your shoulder blades and you are able to rest your head on the ball (as shown in the bottom photograph). Squeeze your glutes and draw your navel toward your spine without arching your back. Hold that position for 3-5 seconds. Then walk your feet backward and raise your body back to a completely seated position. All of the above constitutes one repetition of this exercise! Perform 10 repetitions every day, never progressing to more than 20 repetitions.

Use caution if you don't feel stable on the ball. Have someone spot you, or perform close to a piece of furniture you can hold onto if needed until you can perform the exercise on your own.

Don't have an exercise ball to use? We sell various sizes here at APTS—just ask!

All three of the rotator cuffs serve to stabilize the respective region and body part while larger muscles move the joint. These "rotator cuff" muscles are the foundation of the body's stability system.

What's Going on at APTS?

Ronak Patel is a Physical Therapist Assistant student from the newly-accredited Bryant and Stratton College. He is joining us here at Active PT Solutions for his first clinical internship every Friday morning for 12 weeks this summer. Shannon Donohoe is a Doctor of Physical Therapy student from Ithaca College who will be joining us for her first clinical internship for 8 weeks from June 4 until July 27. She will primarily be working with Tom and Carolyn, but you will see her around the clinic. Please make both Ronak and Shannon feel welcome and help us help them learn about the wonderful world of physical therapy!

Tom Zirilli, PT, finished his ergonomic certification.

Dr. Buchberger has been chosen to be a member of the USA Triathlon medical staff for the MultiSport World Championship Festival in Odense, Denmark. He will be in Denmark from July 3-July 10. Having worked previously with USA Swimming (California), USA Bobsled (Germany), and multiple Summer World University Games (South Korea & Taiwan), he will now add Triathlon to his international experiences!

Active PT Solutions is also once again sponsoring the Downtown Auburn Mile on Friday, August 24.

APTS Night at the Doubledays

Active PT Solutions is sponsoring another Doubledays Community Night on Thursday, July 19. We have vouchers for free tickets available at the office for the game that night, which starts at 6:30 PM against the Mahoning Valley Scrappers. Vouchers will also be available at various retailers around Auburn. We will also have a booth with ponchos and koozies to give away at the game. If you're able to attend, stop by and say hi!

Thoracic Outlet Syndrome

Numbness and tingling are perhaps some of the most common symptoms people will experience in the hand. In most cases, the first thought related to numbness and tingling in the hand is that it must be carpal tunnel syndrome (CTS). Thoracic outlet syndrome or TOS is another condition that affects the arm and hand by producing numbness and tingling. Fortunately symptoms of these conditions follow a road map of sorts making it easier to distinguish one from the other. For example, the most common symptom pattern for carpal tunnel syndrome is to have numbness and tingling in the palm side of the first three fingers of the hand. Thoracic outlet syndrome, however, will present with numbness and tingling in either the ring finger and pinky or the entire hand depending on the subtype of thoracic outlet syndrome that is present.

There are three different types of thoracic outlet syndrome: neurogenic, vascular, and secondary. Neurogenic TOS involves compression of the main bundle of nerves that exits the neck and travels into the arm. The compression usually occurs as the nerves course between the scalene muscles in the front of the neck or as the nerves travel under the collarbone. Vascular TOS can take two forms: arterial or venous. Compression of either the subclavian artery or subclavian vein under the collarbone can happen if the area is narrowed or can occur secondary to repetitive movements of the shoulder and arm (such as throwing). Secondary TOS occurs when the shoulder joint becomes unstable. Since the shoulder joint is a ball and socket joint, the ball part of the joint fails to stay centered in the socket during movement and puts chronic traction on the nerves, arteries, and veins passing by it. Over time this instability will begin to cause symptoms similar to TOS.

Symptoms of thoracic outlet syndrome vary based on the type and location of the compression. The most common type of thoracic outlet syndrome occurring in 95% of cases is referred to as neurogenic thoracic outlet syndrome. Neurogenic TOS usually presents with pain, grip strength weakness, numbness and tingling in the hand and arm, as well as neck and upper back pain. Arterial TOS presents with coldness, numbness, tingling, pain, and white discoloration in the fourth and fifth digits or the entire hand. Cramping of the forearm and hand during activity is common. This is known as claudication. Patients usually experience pain traveling down the arm and into the hand, but symptoms are generally absent from the neck and shoulder. Venous TOS presents much differently than arterial or neurogenic TOS in that there is a clear visual sign. The patient's arm and hand will swell and display a blue discoloration and will have a feeling of fullness or aching in the arm. In overhand athletes such as baseball players it will be most pronounced during throwing activities.

Secondary TOS occurs when the ligaments of the shoulder (glenohumeral) joint are too loose to maintain stability and the joint becomes unstable during movement. If the shoulder joint slips forward it will traction the neurovascular sleeve (a bundle of a nerve, artery, and vein) as it passes in front of the shoulder. When this happens repeatedly as in throwing or lifting, the patient will begin to experience TOS symptoms such as numbness, tingling, and weakness in the arm and hand, especially with the activity that brought on the symptoms in the first place.

Neurogenic and Secondary TOS are best treated with conservative physical therapy and/or chiropractic treatments. When a patient has been diagnosed with neurogenic TOS, the initial goal is to reduce the nerve compression between the neck and the shoulder. Soft tissue techniques such as Active Release Techniques (ART) are very effective at reducing nerve compression. Posture should be addressed with manual therapies to the neck and upper back. Patients should be instructed on specific exercises to improve strength and endurance in their postural muscles. If the patient is diagnosed with secondary TOS, the focus of treatment is slightly different in that the shoulder joint instability must be corrected with a comprehensive rotator cuff and postural strengthening program. Improving posture and strengthening the rotator cuff will prevent the shoulder joint from slipping forward and tractioning the neurovascular sleeve.

If you are displaying symptoms consistent with arterial or venous TOS you should see a vascular or orthopedic surgeon. Venous TOS may be initially treated with a variety of medications aimed at reducing clot formation. Decompressive surgery may be necessary if pharmaceutical treatment does not resolve the symptoms. Arterial TOS will require a surgical solution. If an extra rib (known as a cervical rib) is present, it may need to be removed. Then the aneurysm will need to be repaired. Keep in mind that carpal tunnel syndrome is not the only condition that causes numbness and tingling in the hands.

Article by Dale Buchberger, DC, PT, CSCS

"CrossFit is the principal strength and conditioning program for many police academies and tactical operations teams, military special operations units, champion martial artists, and hundreds of other elite and professional athletes worldwide."

APTS Recipe Box:

These grain-free, fluffy hamburger buns are yeast-free and only take 5 minutes to prepare!

Ingredients

Dough: 3/4 cup cassava flour, 3 tbsp psyllium husk powder, 4 large eggs, 1/2 cup applesauce, 1 tsp baking powder, 1/2 teaspoon sea salt.

Toppings: egg wash (whip one egg), black sesame seeds (for sprinkling on top)

Instructions

1. Preheat oven to 400F. Line a baking sheet with parchment paper.
2. In a food processor, combine all the ingredients for the hamburger buns. Puree until the dough is smooth.
3. Divide the dough into four equal parts and shape into a round ball. If the dough is sticking, coat your hands in water and then shape the dough. Pat the round buns down into a dome shape. Brush the buns with egg wash and then sprinkle with sesame seeds.
4. Bake for about 22-25 minutes until golden brown.

Pair this bun with your favorite burger, sandwich meat, or even just butter or jam!

Source: https://paleoglutenfree.com/recipes/5-minute-fluffy-flourless-paleo-hamburger-buns/

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Get Well...Get Active...Be Active

Newsletter Edited by Carolyn B. Collier, PTA

At Active Physical Therapy Solutions, we utilize the most cutting edge treatment and management techniques available. Our goal is to deliver the best possible healthcare in a friendly, caring, and well-organized environment. Our staff is here to provide active solutions to achieving your personal goals!

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Nutrition 101: Eat Your Veggies!

Testing for celiac disease can be tricky. First, there's different blood tests to pick from. Then there's the question of whether or not to undergo an intestinal biopsy, which was once considered the gold standard of celiac diagnosis. Even many healthcare providers are confused. Here are the three most common pitfalls and myths related to testing.

Step 1: Blood Tests Experts strongly recommend that you get tested for celiac disease before going gluten-free. There are 5 main blood tests. They all look for antibodies (some to yourself, some to gluten) in your blood that shouldn't be there if you don't have celiac. Because no single test is perfect, they're usually bundled into panels of 3 or more tests.

Step 2: Biopsy Celiac disease causes damage to the small intestine. This is best detected via biopsy, a tiny sample of tissue taken during an endoscopy. All US medical association guidelines mandate the biopsy in adults and children as part of the diagnostic process, even though some feel that today's blood tests are good enough. "Not only are blood tests imperfect, having any uncertainty about the celiac diagnosis may lead to doubt about strictly following the gluten-free diet over the long term," says Benjamin Lebwohl, MD, MS, a leading celiac researcher and gastroenterologist at the Celiac Disease Center at Columbia University. During the endoscopy, a biopsy should always be taken in at least 4 areas of the duodenum, including the bulb. This is critically important to ensure a proper diagnosis. Intestinal damage due to celiac disease can be patchy and therefore easily missed without multiple samples.

Optional Step 3: Genetic Test When the blood tests and the biopsy are inconclusive, or when a person is already on a gluten-free diet, the genetic test can be useful. This blood test (or cheek swab) looks for the genetic markers DQ2 and DQ8. If you don't have these markers, you can be almost certain you don't have celiac disease. Yet a positive result does not mean you have celiac disease, since the markers are very common in the general population.

Optional Step 4: Skin Biopsy About 1 in 5 people with celiac disease have a blistering, intensely itchy skin rash known as dermatitis herpetiformis (DH). These celiac intividuals may not have any gastrointestinal symptoms and up to 20% will have normal celiac blood tests and intestinal biopsy results. A skin biopsy by a knowledgeable dermatologist is the key tool in confirming DH. The biopsy must be taken from an area next to a lesion— not directly on a lesion—to look for the hallmark IgA deposits.

Common Pitfall 1: Going Gluten-Free Too Soon This is huge. When you go gluten-free, the number of celiac antibodies in your blood starts to decline and your intestinal tissue begins to heal. Depending on how long you've been gluten-free (the amount of time varies from person to person), testing will come back inconclusive or normal, even when you actually have celiac disease. If you're already gluten-free, a few weeks of steady gluten consumption may be enough for you to undergo a blood test. A recent study showed that after a 2-week gluten challenge (participants consumed 2 slices of bread a day for 2 weeks), lab abnormalities reappeared in the majority of celiacs.

Common Pitfall 2: False Negatives The results of celiac blood tests come back as false negatives in up to 10% of people who have celiac disease. Often this is due to a harmless condition called IgA deficiency, where the body doesn't make enough of the IgA antibody for IgA-based tests to be accurate, says Ritu Verma, MBChB, a pediatric gastroenterologist and director of theCenter for Celiac Disease at the The Children's Hospital of Philadelphia. The solution is to be sure a total serum IgA test is part of your celiac panel. If you're low on IgA, other blood tests can be used to help determine if you have celiac disease. In some cases, doctors will go straight to the biopsy.

Common Pitfall 3: Unproven Tests Direct-to-customer tests for celiac disease, such as stool kits and saliva tests, are now widely available but these test aren't proven, validated, or FDA-approved. Celiac experts say that it's risky to rely on results from these tests since they can falsely show that you don't have celiac disease. Untreated celiac is associated with a number of serious health problems, including osteoporosis and even cancer. (There is not yet a validated test for non-celiac gluten sensitivity available to doctors or direct-to-consumers.)

Celiac Disease Myth 1: Celiac disease isn't very common, so testing is a waste of time. Celiac disease used to be considered rare, affecting less than one in 1,000 people. Now we know its incidence is on the rise and it affects about one in 100. Recent data shows 4 out of 5 Americans with celiac disease still don't know they have it.

Celiac Disease Myth 2: I've been tested once, so I don't need to be tested again. This misconception is common among family members of celiacs. They assume they're in the clear after one negative test result. The fact is that relatives need to periodically repeat testing while eating a gluten-containing diet. Research shows that celiac disease can develop at any age, even in people in their 80s and 90s.

Celiac Disease Myth 3: I feel better on the gluten-free diet, so there's no point in testing for celiac disease. You'll thank yourself down the road if you know whether or not you're dealing with celiac disease. The treatment for celiac disease is total gluten avoidance for life. That's not the case for everyone who feels better on a gluten-free diet. If you have celiac disease, it will also impact how your doctor monitors your health. You'll want to have family members tested too.

Article by Carolyn Collier, PTA

Source: https://www.glutenfreeandmore.com/issues/4_39/Testing-for-Celiac-Disease-4320-1.html