WEEK 2

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
Your assignment consists of two parts. First, make a list of all the muscles that perform hip abduction and external rotation. Pay attention to any muscles that perform both actions since it will help you further along this course. Second, explain why you think it's common for people to have weakness with hip abduction and external rotation. Your answer should be at least 250 words.

The muscles of the hip control a number of actions, including abduction and external rotation, which are essential in performing a variety of movements. The gluteal group and many other muscles play an essential role in abducting and externally rotating the hip.

The gluteal group includes the gluteus maximus, the gluteus medius, and the gluteus minimus. The gluteus maximus is the largest gluteal muscle and extends the thigh while also assisting with rotation. The gluteus medius is between the gluteus maximus and gluteus minimus and abducts and medially rotates the thigh. Finally, the gluteus minimus, the smallest of the three muscles in this group, abducts and medially rotates the thigh.

There are a few other muscles that are involved in abduction and external rotation. The piriformis, sartorius, and gemelli both externally rotate and abduct the hip. The psoas minor and major along with the quadratus femoris play an essential role in abduction only. Together, all of the aforementioned muscles help promote stability and power in abduction and rotation of the hip.

People unfortunately do not often engage these muscles due to sedentary lifestyles, either due to the nature of their work, hobbies, or both. The gluteal group suffers tremendously due to lack of engagement throughout the day, and often becomes weakened or dormant. Other muscles pick up the slack during physical activity when gluteal muscles are weak, which can lead to improper motions increased risk of injury. Balance and stability are also affected when these abduction and external rotation muscles are in a dormant state, which is why it is important to perform exercises that keep these muscles activated and engaged.

WEEK 3

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
For your assignment, explain the benefit of placing a resistance band around Tom's lower thighs while he performs a squat. Which hip muscles does the band activate that aren't normally activated with a regular, bandless squat? Why is it important to have Tom perform the band squat slowly at first? Keep in mind which type of motor control you're trying to enhance. Your answer should be at least 250 words.

Tom will benefit from resistance band training because it will help him relearn movements to engage the correct muscles using proper form. The pain and discomfort he is experiencing is indicative of weakened hip abductors and external rotators, which means these muscles are not engaging when they should be. A common result of these weakened muscles is known as knee valgus, which is a common movement dysfunction that manifests in bowed-in knees during regular physical activities. By placing the resistance band around the thighs, Tom will be forced to engage the dormant abductor and rotator muscles, which in turn will help reduce discomfort and risk of injury. The muscles that will be activated through this corrective exercise are the gluteal group (maximus, medius, and minimus), the hamstrings, the quadriceps, and the biceps femoris. The glutes especially become dormant due to certain sedentary lifestyle choices, which causes these issues because of how crucial these muscles are in abduction and external rotation. By using the resistance bands, Tom will be able to activate and strengthen these muscles until they begin to engage automatically on their own.

When starting with resistance bands, Tom should do the exercises slowly to learn how to do the movement correctly with the band. This is known as closed-loop motor control, where a motion is being ingrained in a person’s synapses to eventually become automatic. After performing this movement with the band for a few weeks, the speed can be increased until the muscles involved become automatically engaged, which is known as open-loop motor control. Open-loop motor control is achieved once the muscles activate naturally on their own without being engaged by an external force like the resistance band. By engaging the muscles in this way, motor learning is positively impacted as the synapses responsible for this type of movement are restructured. Consistent practice must be done in order to retrain the brain and build stronger synapses, which is why the resistance band training will be incorporated for many weeks.

WEEK 4

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
For your assignment, explain how you will use the Lower Extremity Functional Scale (LEFS) with Tom. What type of information will it tell you? How do you specifically know if he's making a positive change, based on the information the scale provides? Your answer should be at least 250 words.

The Lower Extremity Functional Scale (LEFS) is a 20-question questionnaire that identifies functional problems in the lower body. The lower the score, the greater the restrictions and dysfunction being experienced. The lowest possible score is 0, which would indicate high-level physical disability, while the highest score is 80, which would indicate exceptional functionality and no restrictions to movement whatsoever. Based on the results, a percent of maximal function can be calculated by taking the score, dividing it by 80 (total possible points) and then multiplying the result by 100. This calculation provides solid data to turn to as a representation of how functional a person really is.

The LEFS will help identify any restrictions Tom is experiencing so functional exercises can be incorporated to help strengthen these areas. I would use this scale prior to the initial assessment with Tom to gain more insight into the current restrictions Tom is facing in his daily life. I can use this information to determine his overall functionality and focus certain exercises on the lower body to uncover specific muscles or muscle groups that are contributing to that restriction.

Once I have an understanding of what movements are causing Tom the most discomfort or trouble, I can develop a plan to strengthen them through the use of corrective movements and corrective exercise tools, like resistance bands. These movements and Tom’s overall functionality can then be assessed every four weeks to determine progress in overcoming any restrictions he is facing. If there is at least a change of 9 scale points on the LEFS, then notable progress is occurring. It will be important to reevaluate frequently to ensure modifications are being made if a plateau is evident or if functionality is worsening or changing very minimally.

WEEK 5

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For your assignment, explain how you'll address the three components of motivation to improve your sessions with Tom. Provide a hypothetical scenario where each component becomes a factor, as well as the steps you'll take to address each one. Your answer should be at least 250 words.

The three components of motivation are autonomy, belonging, and competence. Autonomy is a sense of control and independence, which is essential in every aspect of a person's life. Physical autonomy can be achieved and better maintained through regular exercise, and when physical independence is threatened, corrective exercise can help fix the issue before it affects functionality and daily living beyond repair. I can help establish more autonomy in Tom's life by involving him in decision-making regarding the exercises that we do during his sessions. I would ask Tom things like what warm up he wants to do or how he wants to get in his cardio for the day. This will help him feel like he is playing a part in his own health and wellness and that he is in control of his success. Additionally, clients may feel discouraged in their sessions since it is not their area of expertise, so autonomy can be improved in clients by asking them for advice too. I would learn more about Tom's interests and skills and ask questions to learn more about areas of expertise to help give him a sense of independence and confidence.

Belonging is the need to feel included, accepted, and connected with others. When people feel out of place, they aren't able to perform at their best and are easily discouraged. Because the exercises they are doing may be foreign to them and potentially very difficult, it is important to help establish a sense of belonging to encourage commitment. This is where making an effort to connect with Tom will make a huge difference in his commitment to our exercise sessions together. I can use my knowledge about Tom's interests and skills to connect more with Tom and help him feel comfortable and accepted in an atmosphere that may be uncomfortable to him.

Competence is the need to feel capable of doing something successfully. Unfortunately, because exercises can often be very unfamiliar and difficult for many people, they often become discouraged and aren't interested in continuing. Learning something new comes with a lot of struggles and frustrations, which is why it would be important for me to work with Tom through these ups and downs. I would gain insight into Tom's concerns by asking him open-ended questions about what concerns he has with exercise and with daily living in general. Because people begin corrective exercise due to a physical restriction or dysfunction, they are often stressed or in pain. I can help Tom overcome the obstacles he will face by understanding his situation and talking to him about how our work together will help change some of the stressors in his life.

WEEK 6

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
For your assignment, fill out the movement analysis form for a one-arm dumbbell row. What are the common compensations you might see, and how will you cue the client to correct each one? Your answer should be at least 250 words.

Client: Tom

Exercise: One-arm dumbbell row

Critical Event #1: The maintenance of the lunge position is essential to keep a strong base. This support will help keep the posture stable during the movement. Tom should keep a soft bend in the front leg with straight back leg.

> **Was this critical event met?** Tom experienced some wobbling in his posture. He overall was able to keep the lunge position but was not able to keep it in stable.

Critical Event #2: There should be flexion and extension of the elbow as the weight is pulled up in line with the chest and then lowered back toward the ground. Tom should squeeze the shoulder blades together to engage the lats, traps, and the rhomboids.

> **Was this critical event met?** Tom did not flex or extend at the elbow but instead pulled his entire arm up in a straight form.

What other movements were observed?

> **Sagittal Plane:** Tom did not flex or extend at the elbow and instead moved his arm in a straight, rigid manner. This caused more of a rotation in his torso as he pulled the weight up using his back and shoulders.
>
> **Frontal Plane:**
>
> **Transverse Plane:** His front foot lifted slightly as he attempted to maintain balance with the lunge posture.

Possible cause for the compensations?

> **Sagittal Plane:** Tom may have weak rhomboids that are causing his trapezius and latissimus dorsi to compensate for the movement to pull the weight up.
>
> **Frontal Plane:**
>
> **Transverse Plane:** Tom may have weak balance that is causing his foot to move to compensate for the poor balance. He also has weakened knees and hips that are unable to maintain the posture that are contributing to the poor balance.

WEEK 7

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
For your assignment, fill out the movement analysis form for a reverse lunge. What are the common compensations you might see, and how will you cue the client to correct each one? Your answer should be at least 250 words.

Client: Tom

Exercise: Reverse lunge

Critical Event #1: The glutes and hamstrings extend to take a backwards step for the first part of the lunge. A tall and rigid trunk is maintained to keep a balanced posture.

> **Was this critical event met?** Tom was unable to take a step backwards without losing his balance. He was not stepping back far enough to keep a taller torso and was leaning forward.

Critical Event #2: The hip flexes as the leg is returned back to the starting position.

> **Was this critical event met?** Tom was able to return to the starting position without as much issue, but this may have been due to smaller step. The hip did not need to be engaged as much to return the leg to the start.

What other movements were observed?

> **Sagittal Plane:** Tom's front knee bent over his front ankle.
>
> **Frontal Plane:** Tom hinged at his hips and was bent forward as he stepped backward.
>
> **Transverse Plane:**

Possible cause for the compensations?

> **Sagittal Plane:** Tom was unable to take a wider step backward due to weak hip extensors which left his front leg bent over his front ankle. This can contribute to poor balance.
>
> **Frontal Plane:** Tom's hip flexors and extensors are not strong enough to maintain a tall trunk as he steps backward. This is causing him to bend at his hips which results in his torso leaning forward over his front knee.
>
> **Transverse Plane:**

WEEK 8

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
For your assignment, explain the relationship between proximal stability and distal mobility. If you determine that Tom has poor mobility of his right hamstring, which activation exercises would you use to increase his mobility without resorting to hamstring stretches? Your answer should be at least 250 words.

Proximal stability creates distal mobility, meaning the more stable the muscles throughout the trunk and pelvis, the more mobile the muscles farther away will be. Muscles around the spine and pelvis play an important role in increasing mobility in the arms and the legs, so if proximal stability can be achieved in these trunk muscles, the distal arm and leg muscles will be more mobile.

Tom is experiencing discomfort in his knees during the squat and lunge motions because of the poor mobility in his hamstrings. The hamstring muscles run along the back of the leg and serve to provide support relative to the muscles in the rest of the lower body. The hips and pelvis play an essential role in maintaining sufficient mobility in the hamstrings and therefore the rest of the lower body, so it is important that the hips and pelvis are stable enough to support lower body movements. One exercise that strengthens the hips is the reverse lunge with a band. Tom will be given a dumbbell to hold with both hands on one side so that the weight is parallel to his torso. This helps keep the torso more rigid and prevents motions that place strain on the lower back. A resistance band will be place around the leg that will be remaining stationary. This will help keep the knee from bowing in due to the weakness in the hamstrings and will promote more focus on the hamstring muscle as the leg fights to be drawn in by that band. Tom will do a standard lunge by stepping the unbanded foot back and bending at both knees. This movement will be repeated for 10-15 reps on each side depending on difficulty, with at least three sets if discomfort does not prohibit continuation. If Tom experiences any pain the exercise will stop immediately.

WEEK 9

Tom is a 36 year-old businessman that likes to compete in outdoor, high-intensity fitness events every few months. Between the events, he performs workouts with a mix of strength and cardiovascular training 4-5 days per week. Tom recently went to a physical therapist because he was experiencing discomfort in both knees when he ran or performed lunges and squats. The physical therapist discovered weakness in his hips' abductors and external rotators. The physical therapist discharged Tom and sent him to you to strengthen those muscle groups.
For your assignment, explain the compensations that can be seen during the modified Thomas Test. Then, choose one of those compensations and explain how you will correct it. Your answer should be at least 250 words.

The most compensations during the modified Thomas Test involve the knee joint extending beyond 110 degrees. The way to determine which hip flexors are shortened during this movement is by observing the thigh. A client may be seen elevating the thigh, which is the result of one or more shortened hip flexors, which are the psoas, iliacus, and rectus femoris. This does not mean all of the hip flexors are shortened but knowing that it is one of the three is helpful in making the necessary modifications to the movement. If the thigh is able to stay flat on the table, this means the rectus femoris is the only flexor that is shortened. In order to correct a shortened rectus femoris and bring the extension below 110 degrees, the quadriceps need to be loosened. This can be done by foam rolling the quadriceps, which should be done slowly and a few inches at a time. The sorest, stiffest part of the quadriceps should be focused on with slow movements and deep breathing to help the client move through the motion. Once the client is focusing the efforts on this sore spot the client should lift the head and shift the eyes around the room. This will help the nervous system relax during the movement.