Pilates to correct overactive upper trapezius muscles and prevent scapular elevation.

Stephanie Blum
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Flow Studios, Chicago, IL
Abstract

“It’s important to recognize where your strengths and weaknesses lie... because Pilates exercises balance the body, different movements challenge us in different ways.” (1) Fitness programs such as Insanity and P90X are great for their targeted population – men and women looking to completely change themselves and lose weight while improving their cardiorespiratory strength. These programs definitely helped me in all of these areas of health and fitness, but as I’ve relied on them as my primary source of exercise for several months, I’ve suffered from joint injuries due to excessive overuse and many muscle imbalances in my body. The vast amount of pushups utilized in these fitness programs, while typically a fantastic exercise to shape the upper body, is done at sometimes a very rapid pace, causing the participant to use improper form, recruiting the unintended muscles and therefore changing the focus of the exercise, further leading to muscular imbalances. After months of doing these particular programs, I’ve developed a very overactive upper trapezius muscle and severe scapular elevation. Due to these imbalances I’ve discovered in my body through Pilates practice, I’ve developed a Pilates routine using the Basi Block System. With my program, I hope to strengthen my Latissimus Dorsi and Pectoralis Major muscles for enhanced shoulder adduction, my Infraspinatus and Teres Minor to improve my shoulder external rotation, and my Triceps Brachii muscles to increase my ability to correctly perform elbow extension exercises without obtaining interference from my upper trapezius muscles. “Pilates exercises will reveal the original source of the problem and address it directly. There are no short-cuts to solving bad posture.” (1)
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**Anatomy**

The Trapezius muscle is a superficial posterior muscle that is largely responsible for elevating the scapula. “A very wide, triangular muscle that covers almost all the other muscles of the nape of the neck and a large part of the back. It originates in the occipital bone and the spinous processes of the cervical and dorsal vertebrae, from where it converges on the shoulder and it’s inserted in the scapula and the clavicle. It elevates the shoulder.” (2) Another muscle involved in elevating the shoulders that tends to join the upper trapezius muscle and take over when performing exercises involving shoulder horizontal adduction, forearm extension, and shoulder adduction is the levator scapulae muscle. The levator scapulae muscle is “a triangular muscle that originates in the transverse processes of the four or five first cervicle vertebrae. It converges to be inserted in the medial border of the scapula. It acts to incline the scapula and depress the shoulder.” (2) In order to improve shoulder adduction, shoulder external rotation, and elbow extension without relying on the upper part of the large trapezius muscle to interfere and take over, it’s important to place a serious emphasis on performing exercises that focus on strengthening particular muscles without recruiting the upper trapezius at all. The lattisimus dorsi muscle, “a very wide, thin muscle that extends across the lower back. The external part originates in the spinous processes of the lumbar vertebrae and dorsal vertebrae. The inferior part originates in the sacrum and the iliac crest and the superior part in the last three to four ribs. The muscle ascends towards the axilla and is inserted in the humerus through a tendon. With the arm raised, its contraction makes the humerus descend while rotating it internally.” (2) is one of the muscles my Pilates program was focused on strengthening. Along with the lattisimus dorsi muscle, it was also vital to put significant emphasis upon the serratus posterior inferior muscle,
“The serratus posterior inferior muscle is located in the back, in the lower portion of the thorax. It branches off of the ventral primary rami, a section of spinal column (T9 to T12). The serratus posterior inferior muscle is a respiratory muscle that inserts in ribs nine to twelve at lateral angles. The function of the serratus posterior inferior muscle is to pull down the lower ribs, assisting with forced expiration.” (3) Also, focus will be placed on recruiting the triceps brachii muscle, “a thick muscle that occupies the posterior area of the arm. Its superior part consists of three portions. The long portion, which originates in the external border of the scapula, the external portion, or vastus externus, which originates in the posterior face of the humerus, and the internal portion, or vastus medialis muscle, which originates in the posterointernal face of the humerus. The three portions unite to form a thick muscular mass which terminates in a tendon which is inserted in the olecranon of the ulna. The triceps brachii is an extensor of the forearm over the arm.” (2) Focus on the triceps brachii will be important due to the proper alignment of the joints needed in order to prohibit the levator scapulae and upper trapezius muscle from taking control.
Muscular Anatomy of the Back

Deep Muscles
- Splenius capitis
- Splenius cervicis
- Levator scapulae
- Rhomboid minor
- Rhomboid major
- Erector spinae
- Serratus posterior inferior

Superficial Muscles
- Trapezius
- Spine of scapula
- Deltoid
- Infraspinatus
- Teres minor
- Teres major
- Latissimus dorsi
- Thoracolumbar fascia
- External oblique
- Internal oblique
- Gluteus medius

UPPER TRAPEZIUS

Upper Fibers

Middle Fibers

Lower Fibers
Upper trapezius and levator scapulae tend to fire and take over when performing exercises that extend what its intended actions are.

**UPPER TRAPEZIUS**

*Origin:* Occipital bone, nuchal ligament on cervical SP

*Insertion:* Outer third of clavicle, acromion process

*Actions:* Scapular elevation & upward rotation

**LEVATOR SCAPULAE**

*Origin:* TP of C1 through C4

*Insertion:* Vertebral border of scapula between the superior angle and spine

*Actions:* Scapular elevation & downward rotation
- Need to focus on building up strength in the bottom half of the trapezius muscle to ensure proper form and improve posture.

**LOWER TRAPEZIUS**

**Origin:** SP of T4 through T12

**Insertion:** Base of scapular spine

**Actions:** Scapular depression & upward rotation

**Latissimus Dorsi**

**O:** Spinous process of T7 through L5, posterior surface of sacrum, iliac crest, lower three ribs, & the tip of the inferior angle of the scapula

**I:** Floor of the bicipital groove

**A:** Shoulder extension, internal rotation

- Build up latissimus dorsi strength and learn how to recruit use of this muscle without the trapezius muscles kicking in.
**Triceps Brachii**

**O:**

- **Long head** - Infraglenoid tubercle of the scapula
- **Lateral head** - Proximal posterior humerus
- **Medial head** - Distal posterior humerus

**I:** Olecranon process of the ulna

**A:** Primary elbow extension, secondary shoulder extension

- I need to gain a lot of strength in these muscles and again, learn to use them separately from the trapezius muscles.
Serratus Posterior Inferior

O: Spinous processes and supraspinous ligaments of T11-L2

I: Posterior aspect of ribs 9-12

A: Assists forced expiration

- Being able to find this muscle and use it to assist in the pulling down of the rib cage to help train my body away from elevation.
Case Study

My name is Stephanie Blum. I’m a 23 year old waitress and exercise enthusiast. I’ve been working out at a rather advanced level for about 3 years now. I began obsessively exercising as I realized how good it made me feel and altogether helped me to lose seventy pounds. My main forms of exercise for the first year were long distance running and boot camp DVDs we had lying around the house that incorporated use of both weights and cardio. After the fat started melting off, I craved more. I began using fitness programs like Insanity and P90X, both very extreme at-home fitness programs, as my main source of physical exercise. Since these regimens are very physically demanding, and at times entirely exhausting, I wound up with injuries, such as patellafemoral pain in my knees, tendonitis in my left ankle, and plantar fasciitis in my left foot. I began attending physical therapy sessions with a doctor who is also certified in Pilates and has her own Pilates studio. I began regularly attending Pilates classes, along with receiving physical therapy for my injuries, and found that I was still able to partake in my intense workout routines without injury or pain. It took the Basi CTTC training course for me to understand all the muscular imbalances that were now present within my body. I was unable to correctly perform exercises such as Back Support on the Reformer, or Jack Knife on the Wunda Chair due to my lack of functional muscular strength, which to someone who loves a good fitness challenge and loves being able to succeed, was super distressing and I immediately knew that in order to truly feel accomplished and proud of my body, I would need to address these imbalances and fix them. Through the Pilates conditioning program that I’ve created for myself, I’ve made sure to strengthen my lower trapezius, latissimus dorsi, serratus anterior and serratus posterior inferior, triceps brachii muscles and increase my thoracic extension, while trying not to
recruit my overactive upper trapezius and levator scapulae muscles. I’ve also placed emphasis on stretches for my tight hip flexors, hamstrings, and exercises to help strengthen my transverse abdominus muscles, since these are other areas I’ve found needed a little TLC throughout my CTTC course, but since they’re not the main focus of this case study, I practice more routines on alternating days to really work these areas as well.
Application of the BASI Pilates Method (Intermediate)

Warm-Up

Mat:

- Pelvic Curl, Spine Twist Supine, Chest Lift, Leg Changes, Hundred Prep,
  Roll Up, Roll Like A Ball

Foot Work

Cadillac:

- Parallel Hells, Parallel Toes, Open V Hells, Open V Toes, Calf Raises,
  Prances, Hip Opener

Abdominal Work

Wunda Chair:

- Standing Pike*, Cat Stretch Kneeling*, Pike Sitting*, Full Pike*

Reformer:

- Hundred, Coordination, Backstroke*

Hip Work

Cadillac:
• Frog, Circles Up, Circles Down, Walking, Bicycles

Spinal Articulation

Cadillac:

• Monkey*, Tower Prep*, Tower*

Wunda Chair:

• Pelvic Curl, Jack Knife*

Stretches

Reformer

• Kneeling Lunge, Full Lunge

Full Body Integration

Reformer:

• Scooter, Round Back, Flat Back

Cadillac:

• Sitting Forward, Side Reach, Thigh Stretch with RU Bar, Kneeling Cat Stretch*
Arm Work

Chair:

- Shrugs*, Triceps Press Sit*, Triceps Prone*, Frog Back*

Cadillac:


Full Body Integration

Reformer:

- Up Stretch 1, Elephant, Up Stretch 2*, Up Stretch 3*, Shoulder Push Single*, Shoulder Push Double*

Leg Work

Reformer:

- Hamstring Curl, Single Leg Skating

Chair:
• Hip Openers, Frog Front*

Cadillac:

• Squats*

Lateral Flexion/Rotation

Reformer:

• Mermaid, Side Over On Box

Barrel:

• Side Lift

Back Extension

Barrel

• Swan Prep*

Cadillac:

• Prone 1*, Prone 2*

Chair:

• Swan Basic*
Reformer:

- Breaststroke Prep*, Breaststroke*, Pulling Straps 1*, Pulling Straps 2*

Some of the exercises that I’d included in my regimen obviously weren’t included with intentions of improving my previously stated muscular imbalances, but as a way to enhance the overall Pilates session and ensure that all areas of my body were paid attention to. The exercises that I’ve marked with an asterisk (*) are the ones I found were most beneficial to the purpose of my case study and the exercises I performed more repetitions of.
Conclusion

I’ve completed ten sessions of this Pilates conditioning program and have noticed significant differences in my body. I’m now a lot more aware of the muscles that should be working and am able to, with extreme concentration, turn off my levator scapulae and upper trapezius muscles when they so rudely intervene in exercises they weren’t invited to. Not only has this program helped strengthen the muscles I’d hoped it would, it’s conditioned other parts of my body as well, as a well-structured Pilates program should. I also notice in everyday life when performing tasks, such as bending over to pick up a box, that I’m able to recruit the correct muscles and practice good form in my functional movements. I will continue to utilize the Pilates Method to help with my muscular imbalances so that I can continue to partake in intense cardiovascular routines with correct muscle recruitment and no pain or injury.
Bibliography


