

# MUSCLE MAPPER

PDF Guide



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# Why Map Your Muscles?

Hello! Thank you so much for getting Muscle Mapper from The Singing Athlete.

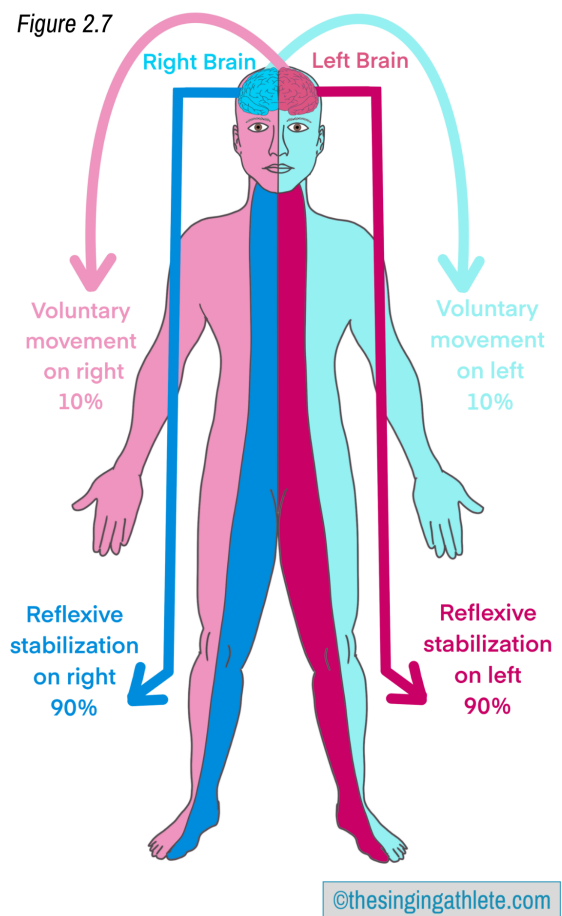
I want to take a moment to explain why I made this course for you.

At its most basic level, the course is here to help you improve the contraction and relaxation maps in your body.

By doing this, you can reduce pain and improve athletic and vocal performance. These exercises also may help you lower stress and anxiety, as well as improve your autonomic functions, like breathing rate, heart rate, and digestion.

To understand why muscle mapping is so powerful, let's look at some basic neuroscience:

- The nervous system does 3 primary things:
  - Receives input (Afferent)
  - Decides what the input means and what to do about it (Processing)
  - Creates motor output (Efferent)
- The right cortex:
  - Controls voluntary movement on the left side of the body
  - Sets the reflexive stability on the right side of the body
- The left cortex:
  - Controls voluntary movement on the right side of the body
  - Sets the reflexive stability on the left side of the body
- All sensory input eventually goes to the contra- lateral cortex, except smell.



Contract your RIGHT biceps muscle. As you do this, your LEFT brain is driving the voluntary movement of your RIGHT arm. At the same time, your LEFT brain is sending signals down the LEFT side of your body to keep you stable.

The drills that you will be learning will be increasing your voluntary movement capacity, but will also be helping to improve your overall stability, which can make for a calmer and more resilient system.

As you work through the drills, you may find that one side makes you feel awesome, whereas the other side feels strange or makes you feel “off”. Keep track of this—it can be a clue into which side of your brain needs the activation.

## Threat

**Threat** is anything your brain thinks might be dangerous. As you go through your day, your brain is looking for patterns and making predictions based on what it perceives. When new information enters your field of awareness, the brain compares this novel stimulus to previous experiences and to what is expected in this environment. If you see a deer in the woods, you may marvel at the beauty of nature. If you see one in your kitchen, some different thoughts will probably arise.

Based on the clarity of its predictions, the brain can react to potential threats as vehemently as real ones (e.g., performance anxiety). One of the goals of brain-based training is to improve your nervous system's predictive capacity. A great way to do that is to know where your body is in space (proprioception).

By working through the drills in this course, you will be clarifying for your brain where things are in your body. And that is a great way to lower threat and stress in your life.

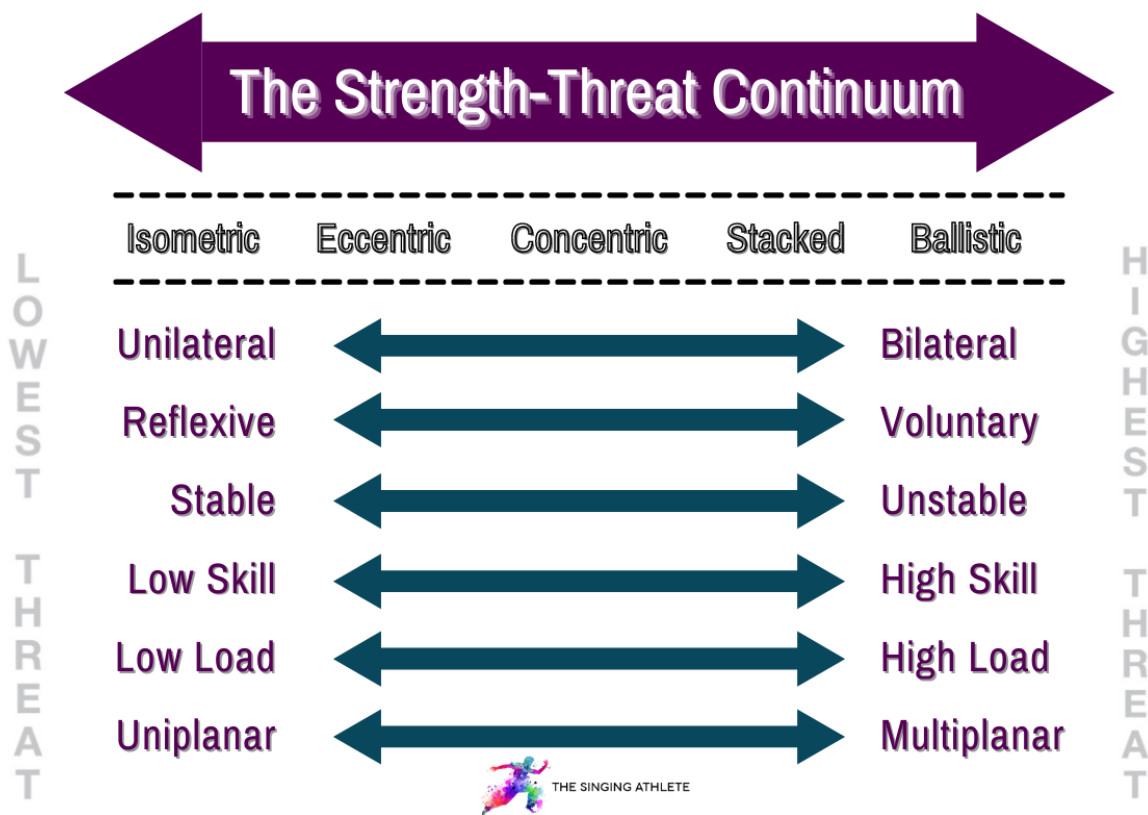
## Low-Threat Workouts

Any exercise regimen can help with stress. From a brain perspective, though, there are some types of training that are lower-threat. Here are some definitions for strength training:

**Isometric** muscle contractions generate force without changing the length of the muscle. An example is maintaining grip on a heavy object. Isometric contractions are involved in maintaining body alignment and posture.

**Eccentric** contractions results in the elongation of a muscle while the muscle is still generating force; in effect, resistance is greater than force generated. Eccentric contractions can be both voluntary and reflexive. These contractions can also be thought of as a deceleration of movement.

A **concentric** contraction is when a muscle shortens while generating force, overcoming resistance. For example, when lifting a heavy weight, a concentric contraction of the biceps would cause the arm to bend at the elbow, lifting the weight towards the shoulder. This kind of a contraction can also be thought of as an acceleration of movement.



A **stacked** contraction would be one in which other body systems were involved in the exercise. For example, a certain eye position might be maintained to

engage the visual system, or a certain head position would be held to activate the inner ear.

A **ballistic** contraction can be defined as muscle contractions that exhibit maximum velocities and accelerations over a very short period of time. Box jumps, kettlebell swings, and punching a bag can all be considered ballistic movements.

When it comes to threat, isometric training is the least threatening. Other elements that help lower threat are working on one side of the body at a time, using less load, and training on a stable surface.

This Muscle Mapper class employs isometric exercise—we are going to find a muscle contraction and hold it. This is because isometrics lower threat in the brain. We will also be working on each side of the body individually with low load to make sure that threat stays low.

Isometrics have also been shown to reduce pain through the production of endocannabinoids (our inner “weed” system). So the drills you will learn here are strength-building and pain-reducing.

## Assess and Reassess

There are several ways you can work through the course.

The simplest is just to work through it in order. You will get a ton of benefit out of this version.

If you’re working on something specific in your body, you may want to use the “Playlists” to address certain areas and muscle groups to help resolve any lingering issues.

Another cool way to use the course is to learn more about your brain. To do this, you will use a process called “Assess and Reassess.”

In the assessment phase, you will check your range of motion. Some options are:

- Forward bend
- Torso rotation
- Shoulder flexion
- Shoulder abduction
- Shoulder internal/external rotation
- Neck rotation/lateral flexion

Here's a video of me demonstrating these motions from my "Bands and Benches" course.

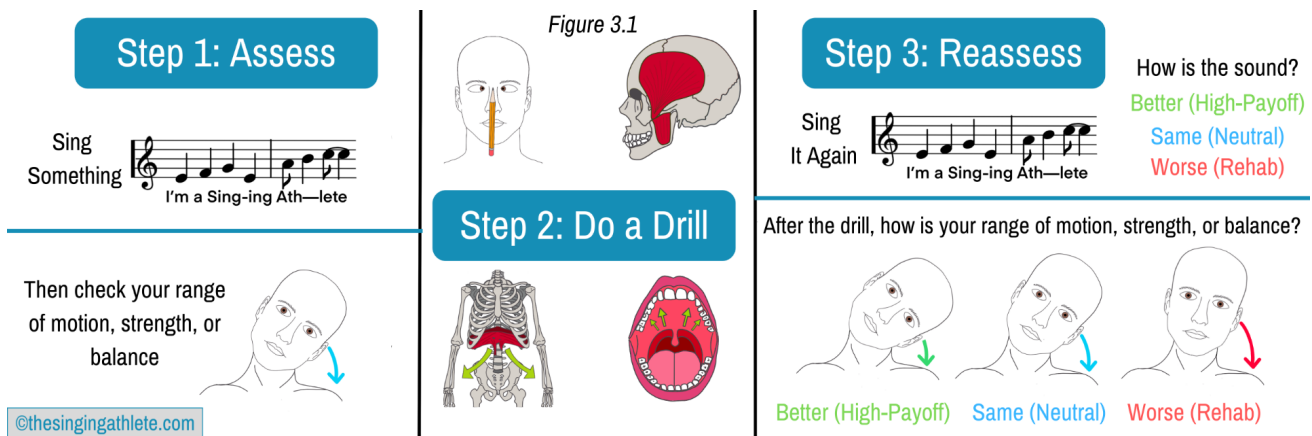
As you go through these movements, you are trying to identify limits. Can you get your palms flat on the floor in a straight-leg forward bend? Does one arm get stuck in front of your ear as you go into shoulder flexion? When you've identified something that feels sticky, use that as a secondary reassessment after the drills.

You can also assess by singing a scale or a phrase of music to see how your voice is feeling. Choose something that presents a technical challenge but that won't exhaust you to repeat many times. If you're a beginner and you don't know what to sing, you can assess with any favorite song. "Happy Birthday" is fine.

Once you've assessed your body and/or voice, you will do one of the Muscle Mapper stretches. Then you will do the same movement and/or sing the same musical phrase again as a reassessment.

There are three possible outcomes from the assess and reassess process:

- If your voice improved on reassessment, you know it was a drill that lowered threat for you; we will call that a **high-payoff drill**. You will use your high-payoff drills before performance.
- If there was no perceptible change, it is a **neutral drill** for you. This doesn't mean it has no value, as I'll explain below.
- If there was a negative reassessment (loss of range/tightness in throat/ increased sense of vocal effort), it is a **rehab drill**.



A rehab drill is one that your nervous system is currently finding a bit scary. The drill increased threat in your brain, so it degraded performance. It is NOT okay to ignore rehab drills. Mammals are designed to move, so none of the motions you'll be doing should test poorly. Having a threat response to a movement implies there are mapping errors in that area. Fixing these rehab drills may be the key to resolving issues that have been holding your voice back.

To improve a rehab drill, you have to regress it until it tests as neutral or high-payoff. Regressing a drill means making it easier until the threat you experienced dissipates. Some ways to regress drills are:

- Try it again for less time, do it more slowly, or move through a smaller range of motion (e.g., instead of moving your leg all the way out in front of you, move it halfway).
- If you were doing the drill standing, try it seated. If you were seated, try it sitting on the floor with your back against a wall and your legs stretched out in front of you. You can also do some of these drills lying down on your back, which is the lowest-threat position.
- Be more conscious of slow, low breathing through your nose.
- Close your eyes.

Your neutral drills can be used to reset yourself after discovering a rehab drill. For example, if you have a threat response to doing pectoralis minor stretching, but pectoralis major stretching was neutral for you, you can do the pec major stretch to get yourself back to a balanced state.

Work on a rehab drill for a few weeks in one or more of the regressions above, possibly followed by some neutral drills. If no improvement shows up after a few weeks of diligent practice, you may need help from your high-payoff drills. From a neural perspective, the statement, "If you exercise something, it will get stronger" isn't necessarily accurate. If an area of the brain has been dormant for a long time, the signaling may not be robust enough to create change in the underused territory. The solution is: ***Do something good before you do something bad***

If you struggle with a certain leg exercise, but you always get a great result from a core contraction, do your core drills (high-payoff) first and then work on your leg (rehab).



When it comes to timing:

- Do your high-payoff drills right before you perform, exercise, or need a boost of energy.
- Separate your rehab drills from performance situations by an hour.

So, if you have an 8 p.m. curtain, you can practice your rehab drills in the afternoon and then do your high-payoff stuff right before you walk on stage.

If you are super-flexible and all of the range-of-motion tests feel easy and symmetrical, you can use balance or strength as a secondary assessment. Try standing on one leg with your foot in parallel and your eyes closed, or hold a static squat or plank as a strength test.

While this may seem like a simple idea, the assess/reassess protocol is quite powerful. The challenge in our lives today isn't access to information; it's knowing whom to trust. You have ten million opinions at your fingertips every time you look at your phone. The issue is sorting through all of this noise to get to something that makes sense for you. Luckily, your brain will tell you precisely what you need; you just have to know how to listen. A high-payoff reassessment means you are on the right track to lower threat and perform to your full potential.

## Anatomy Directional Terms

Throughout the course, I will be using certain anatomical terms. Below is an image and description of the directional terms I will be using:

**Superior** - toward the head end of the body; upper (example, the hand is part of the superior extremity).

**Inferior** - away from the head; lower (example, the foot is part of the inferior extremity).

**Anterior** - front (example, the kneecap is located on the anterior side of the leg).

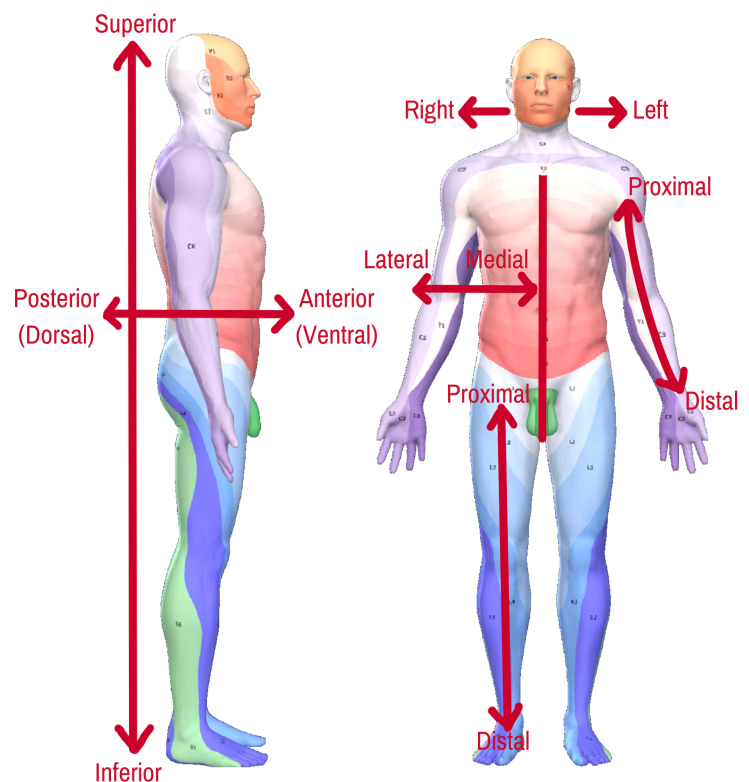
**Posterior** - back (example, the shoulder blades are located on the posterior side of the body).

**Medial** - toward the midline of the body (example, the big toe is located at the medial side of the foot).

**Lateral** - away from the midline of the body (example, the little toe is located at the lateral side of the foot).

**Proximal** - toward or nearest the trunk or the point of origin of a part (example, the proximal end of the femur joins with the pelvic bone).

**Distal** - away from or farthest from the trunk or the point or origin of a part (example, the hand is located at the distal end of the forearm).



**Contralateral** - of or pertaining to the opposite side of the body.

**Ipsilateral** - of or pertaining to the same side of the body.

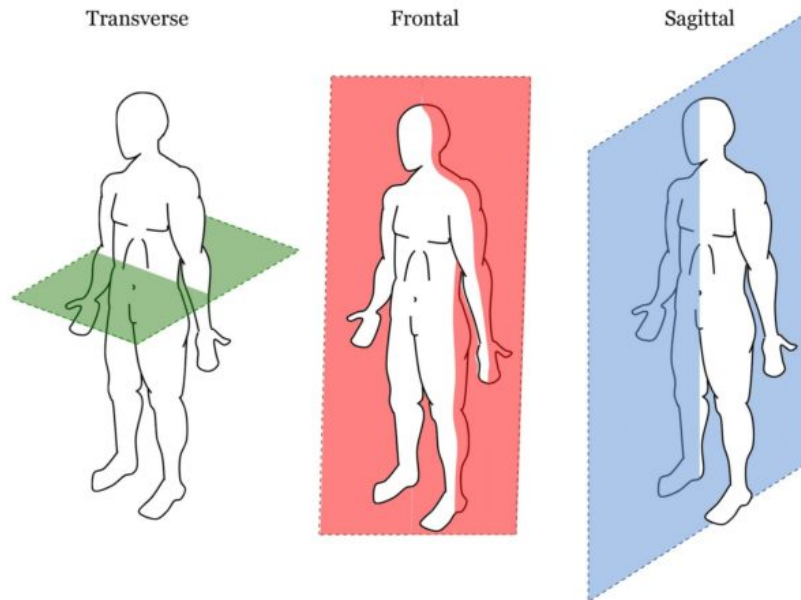
## Three Planes of Motion

There are three planes of motion we'll be using:

**Sagittal Plane** - divides your body into left and right halves and involves forward and backward movements. Exercise examples are: bench press, running, squats, deadlifts

**Frontal Plane** - divides your body into front and back halves and involves side to side movements. Exercise examples are: lateral lunges, lateral raises, suitcase carry, and lateral shuffles.

**Transverse Plane** - divides the body into top and bottom halves and refers to rotational or twisting motions. Exercise examples are: cable wood chops, cable anti-rotation hold, curtsy lunge, and kettlebell halos.



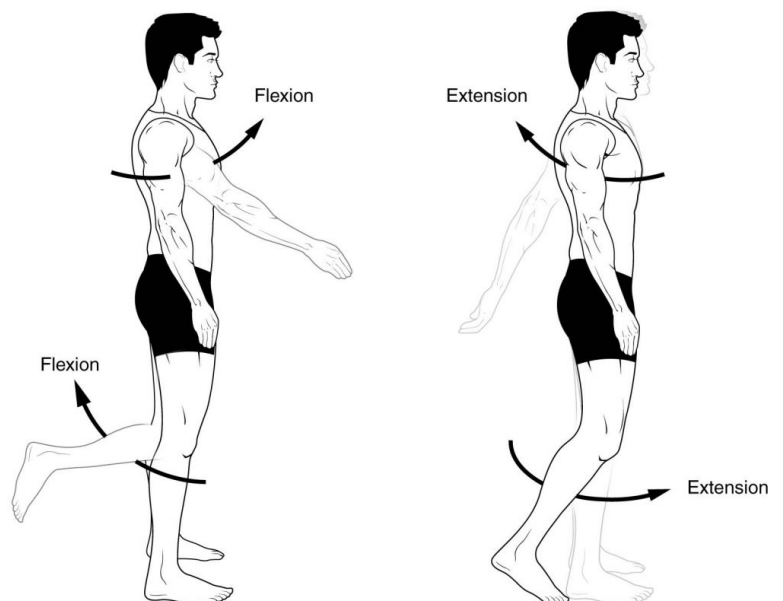
## Anatomical Terms of Movement

The anatomical terms of movement I'll be using are:

### Flexion and Extension

**Flexion** and **extension** are movements that occur in the sagittal plane. They refer to increasing and decreasing the angle between two body parts.

**Flexion** refers to a movement that decreases the angle between two body parts. Flexion at the elbow is decreasing the angle between the ulna and the humerus. When the



knee flexes, the ankle moves closer to the butt, and the angle between the femur and tibia gets smaller.

**Extension** refers to a movement that increases the angle between two body parts. Extension at the elbow is increasing the angle between the ulna and the humerus. Extension of the knee straightens the lower limb.

## Abduction and Adduction

**Abduction** and **adduction** describe movements towards or away from the midline of the body.

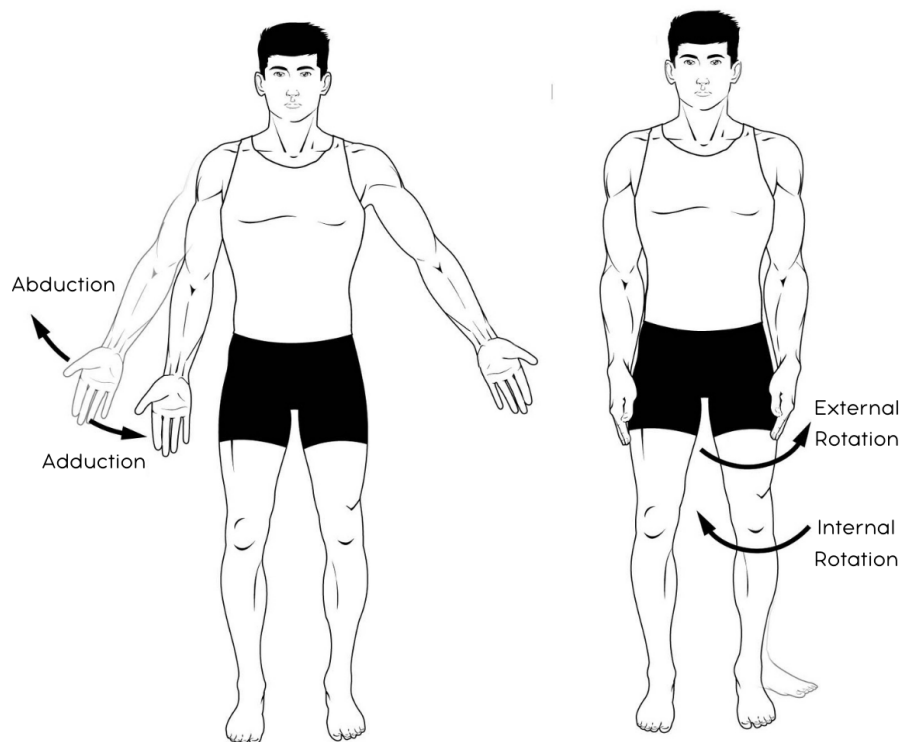
**Abduction** is a movement away from the midline – just as abducting someone is to take them away. For example, abduction of the shoulder raises the arms out to the sides of the body.

**Adduction** is a movement towards the midline. Adduction of the hip squeezes the legs together.

## Internal and External Rotation

**Internal** and **external rotation** describe movement of the limbs around their long axis.

**Internal rotation** is a rotational movement towards the midline. If you straighten your leg and rotate your hip so your toes point inward, that is hip internal rotation. If you held a tray in front of you with your elbow at 90 degrees and brought that hand



toward your opposite flank, that is shoulder internal rotation.

**External rotation** is a rotating movement away from the midline, in the opposite direction to the movements described above.

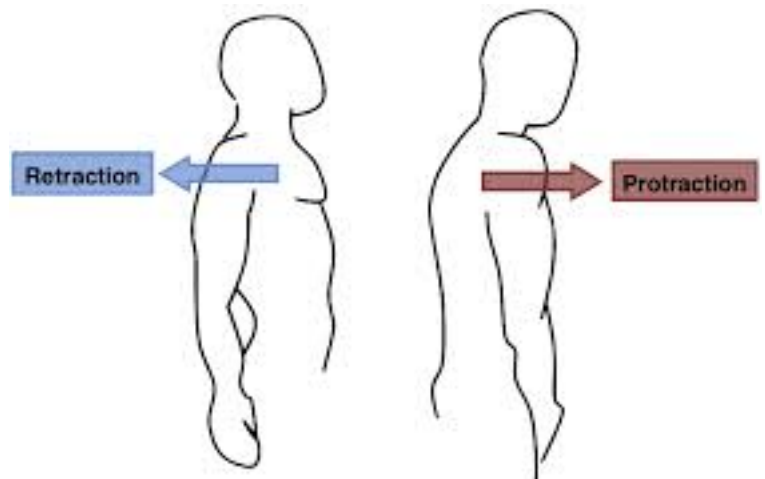
## Elevation and Depression

**Elevation** refers to movement in a superior direction (e.g. shoulder shrug).

**Depression** refers to movement in an inferior direction.

## Protraction and Retraction

**Protraction** describes the anterolateral (forward and out) movement of the scapula on the thoracic wall that allows the shoulder to move anteriorly. In practice, this is the movement of reaching out for something.

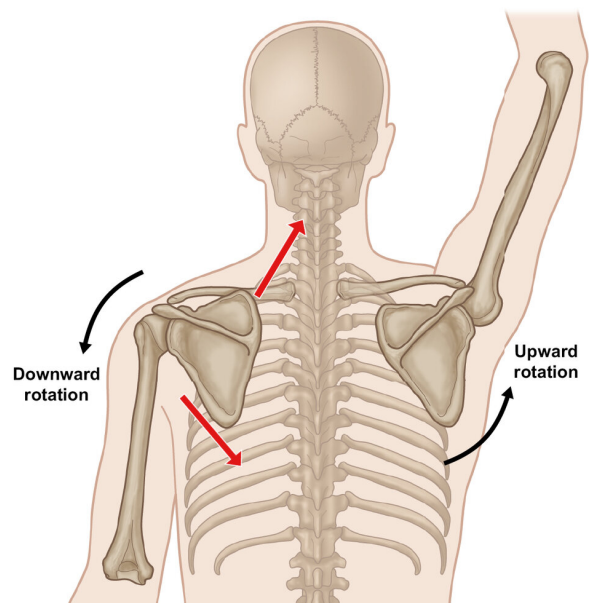


**Retraction** refers to the posteromedial (back and in) movement of the scapula on the thoracic wall, which causes the shoulder region to move posteriorly i.e. pulling something toward you.

## Scapular Upward and Downward Rotation

**Upward rotation** of the scapula happens when you abduct your arm and plays a significant role in increasing the range of motion with your arm overhead.

**Downward rotation** of the scapula occurs as the arm is returned to the



side from a raised position.

## Pronation and Supination

With your hand resting on a table in front of you, keeping your shoulder and elbow still, turn your hand onto its back so the palm is face up. This is the supine position, and so this movement is called **supination**.

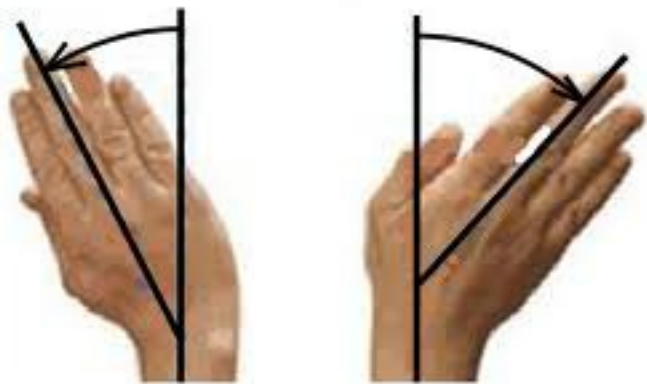
Again, keeping the elbow and shoulder still, flip your hand onto its front, palm down. This is the prone position, and so this movement is named **pronation**.

By the way, these terms also apply to the whole body – when lying flat on the back, your body is supine. When lying flat on the front, your body is prone.

## Ulnar and Radial Deviation

**Ulnar deviation** is the movement of bending the wrist to the little finger, or ulnar bone, side.

**Radial deviation** is the movement of bending the wrist to the thumb, or radial bone, side.



Radial Deviation

Ulnar Deviation

## Anterior and Posterior Pelvic Tilt

**Anterior pelvic tilt** is when the front of the pelvis drops in relationship to the back of the pelvis.

**Posterior pelvic tilt** is the opposite, when the front of the pelvis rises and the back of the pelvis drops.



Anterior Pelvic Tilt



Posterior Pelvic Tilt

## Dorsiflexion and Plantarflexion

**Dorsiflexion** and **plantarflexion** are terms used to describe movements at the ankle. They refer to the two surfaces of the foot; the dorsum (top of your foot) and the plantar surface (sole of your foot).

**Dorsiflexion** refers to flexion at the ankle, so that the foot points more superiorly (toward your head).

**Plantarflexion** refers extension at the ankle, so that the foot points inferiorly (toward the floor).

## Inversion and Eversion

**Inversion** and **eversion** are movements which occur at the ankle joint, referring to the rotation of the foot around its long axis.

**Inversion** involves the movement of the sole so that it faces in a medial direction.

**Eversion** involves the movement of the sole so that it faces in a lateral direction.

