BODYBUILDING Anatomy

SECOND EDITION



Your illustrated guide to increasing mass and sculpting physique

Nick Evans, MD

SECOND EDITION

BODYBUILDING ANATOMY

Nick Evans, MD



Human Kinetics

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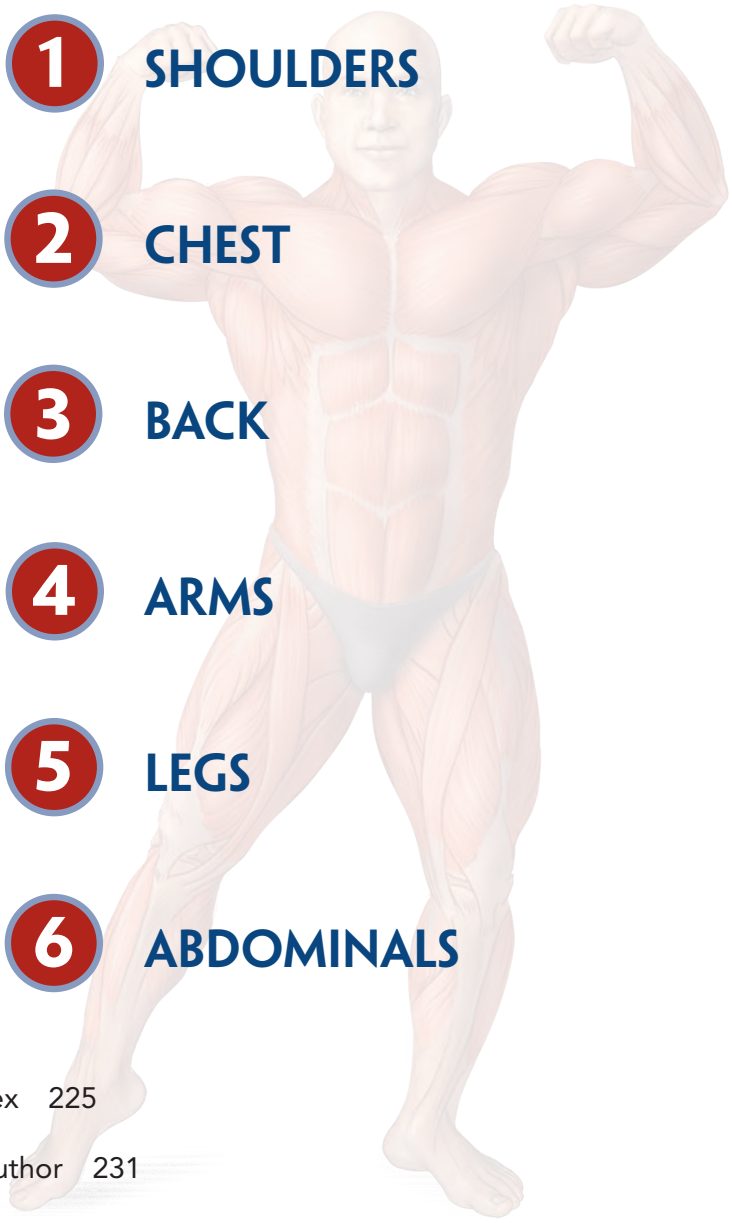
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PREFACE

Walk into any gym these days and it's like Disneyland for bodybuilders. You'll discover endless rows of exercise machines and free weights for every muscle in your body. Your challenge is to navigate through the maze of machines and weights, select the exercises you need, and pump your way across the gym to the finish line. Upside: The winner walks away with a custom-built body. Downside: No instructions, no clues, no map, and no rules. With no guidance, surely you're doomed to circulate around the gym, stuck in a holding pattern. Then one lucky day, in a moment of clarity, you realize a piece of the puzzle is missing.

Today is your lucky day! You've found the missing piece: *Bodybuilding Anatomy,* a book of instructions for every exercise in the gym. Check it out for yourself. Flip open the book and pick a page—any page you want. Now, let's see what you get. Each exercise is illustrated in amazing detail with a picture that's worth a thousand words, revealing the anatomy under your skin: the main muscles at work and those muscles that assist during the exercise. Alongside the illustrations are step-by-step instructions on how to perfect your exercise technique. What's more, you'll find a list of advanced technical tricks that will help you modify the exercise for maximum effect. You'll learn how to adjust your grip, where to position your feet, and how to position your body. You'll discover how to manipulate exercise trajectory and range of motion in order to emphasize different sections of the targeted muscle. Whatever choice you face at the gym—barbells or dumbbells, free weights or machine, wide grip or narrow grip, incline or decline, sitting or standing—you'll get all the help you need. No weight plate is left unturned.

You can review any exercise in this book in less than five minutes. During that short time, you'll discover and learn everything you need to know to make your workouts more precise. This book will shift your training up a gear and then some.

It's no secret what you want from your workouts: a custom-built body. But in order to change the way you look, you must modify your anatomy. You should skillfully use weights to sculpt your body, not just to indiscriminately pack on pounds of flesh. The real secret is that to change anatomy, you must first *know* anatomy.

Bodybuilding Anatomy is the ultimate reference, loaded with detailed technical discussions and illustrated with anatomical precision. The book is systematically organized into muscle groups, so finding the exercises you need in order to build any muscle is easy. What's more, each muscle group is subdivided even further into target zones, allowing you to select the specific exercises you need to target hard-to-hit spots in your physique.

Chapter 1 serves up shoulders—boulder-like shoulders that form the cornerstones of a great physique. You'll discover the muscular anatomy and develop a strategy for detonating your deltoids. Simply packing the plates on a shoulder press is not enough. When you know shoulder anatomy, you'll realize that each of the three sections of the deltoid muscle demand a different exercise. This chapter also reveals the secrets to a strong, injury-resistant rotator cuff.

In chapter 2, you will discover how to hammer and chisel the chest. You will analyze the anatomy and evaluate the exercises that you need to plump up your

pectorals. You'll work all the angles, change your grip, and manipulate your movements to carve up your chest. With these technically precise exercises in your chest workout, you'll build a breastplate of armor that would make any gladiator proud!

Chapter 3 takes you around the back. Three slabs of muscle cover your back. If you train only the lats, your back workout is incomplete. To add thickness across your upper back, you need to target the trapezius. To create a foundation of strength in your lower back, you must work the erector spinae muscles. And when it comes to the latissimus dorsi, this chapter shows you how to perfect your pull-down and revamp your row to create that athletic V-shape taper.

In chapter 4, get ready to arm yourself with a pair of big guns. The triceps make up two-thirds of the muscle mass in your upper arm. This chapter provides all the growth-forging techniques you need to hammer more size into your triceps and beef up your biceps. You'll also get a grip on the 10 ropelike muscles in your forearms that are on display when you wear a short-sleeved shirt.

Chapter 5 is all about legs. Whatever your pleasure—a quadriceps teardrop, an outer-thigh sweep, thicker hamstrings, bigger calves, or a tighter butt—this chapter teaches you how to adapt any leg exercise to meet your own needs.

Chapter 6 is devoted to the development of phenomenal abdominals. It provides the anatomic treasure map to the three zones of your midsection: the upper abs, the lower abs, and the obliques. Each muscle zone requires a different set of exercises. This chapter delivers all the crunches, raises, twists, and turns you need in order to sculpt a sizzling six-pack.

At the beginning of every chapter you get a guided tour of each muscle group. Anatomic descriptions and full-color diagrams introduce you to the muscles and their attachments to the bony skeleton. Throughout the book, the main illustrations are color coded to identify the primary and secondary muscles being worked in each exercise. You'll also see how the muscles are displayed in several of the poses used in bodybuilding competitions.



You'd better believe it: Knowledge of anatomy is the key for any serious bodybuilder. Muscular proportion and symmetry are created by intelligent exercise choices, not by chance. It doesn't matter how much workout experience you have; this book will help you customize your body with the skill of a master mechanic. The next time you set foot in the gym, you'll have a new set of rules to lift by. And by taking the guesswork out of bodybuilding, your efforts at the gym will be more productive and efficient—maximum results in minimum time!

If you are one of the millions of people who work out, this is a book you can't afford to be without. Like having an X-ray of each exercise, *Bodybuilding Anatomy* provides an inside view of your muscles in action. This ultimate bodybuilding reference contains detailed, full-color anatomical drawings of exercises that target every major muscle group. Armed with advanced tricks and modifications that isolate specific muscles, you'll be able to tweak your technique and fine-tune your physique. This book is a must for your gym bag!



chapter 1

SHOULDERS

The shoulder is a ball-and-socket joint between the humerus bone of the upper arm and the scapula bone (shoulder blade). Six main movements occur at the shoulder: flexion, extension, abduction, adduction, internal rotation, and external rotation. During shoulder flexion, the upper arm is elevated forward toward the face. During shoulder extension, the arm moves backward behind the plane of the body. During abduction, the arm moves up and out to the side of the body. During adduction, the arm is pulled in toward the side of the body. Horizontal abduction and adduction occur when the arm moves in a horizontal plane at shoulder level, such as during chest flys or rear deltoid flys.

The deltoid muscle of the shoulder (figure 1.1) consists of three separate sections, or heads, each capable of moving the arm in different directions. From a broad tendon attachment above the shoulder joint, the deltoid's three heads merge into a single tendon that attaches to the humerus bone of the upper arm. The anterior deltoid (in front) attaches to the clavicle and raises the arm forward (shoulder flexion). The lateral deltoid (at the side) attaches to the acromion and lifts the arm out to the side (shoulder abduction). The posterior deltoid (behind) attaches to the scapula and moves the arm backward (shoulder extension).

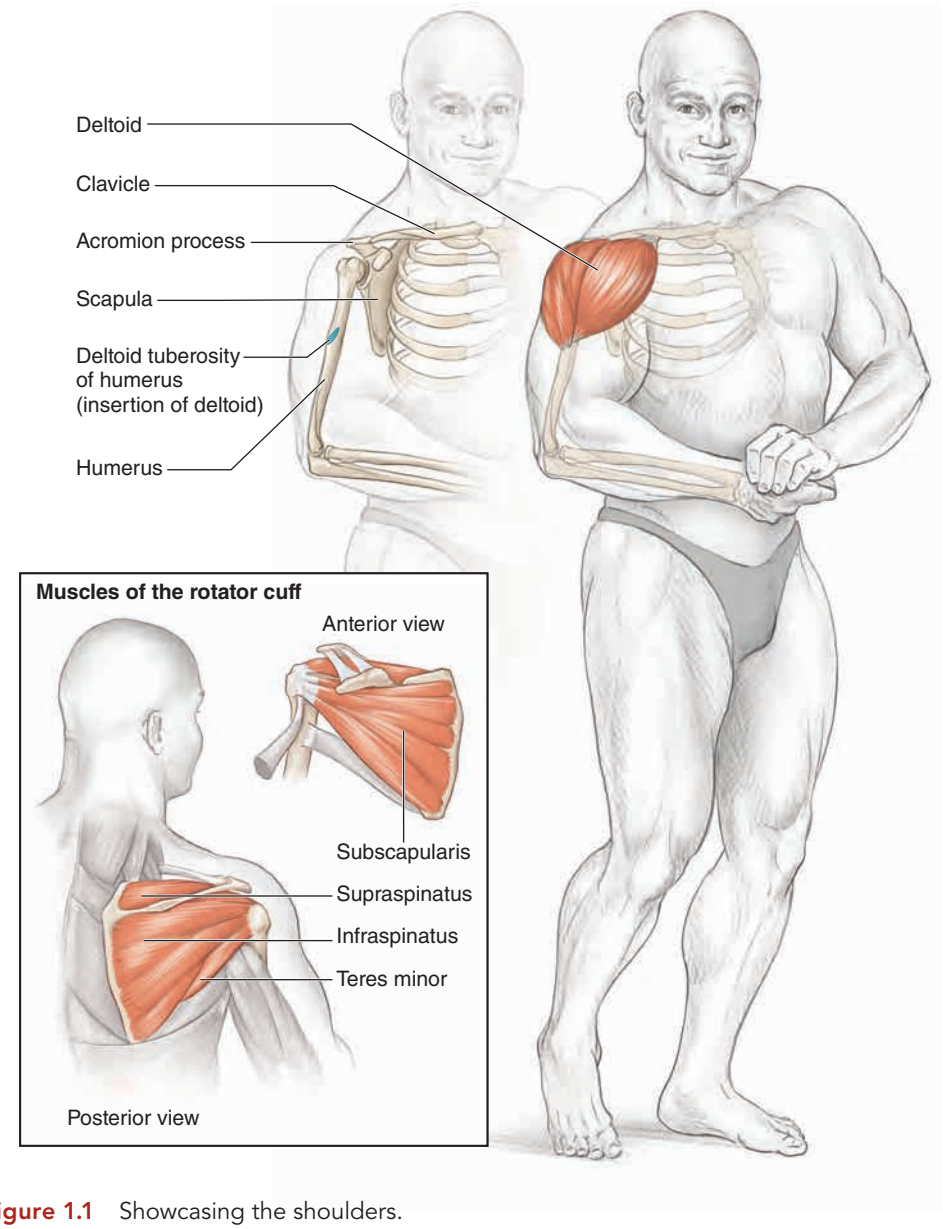
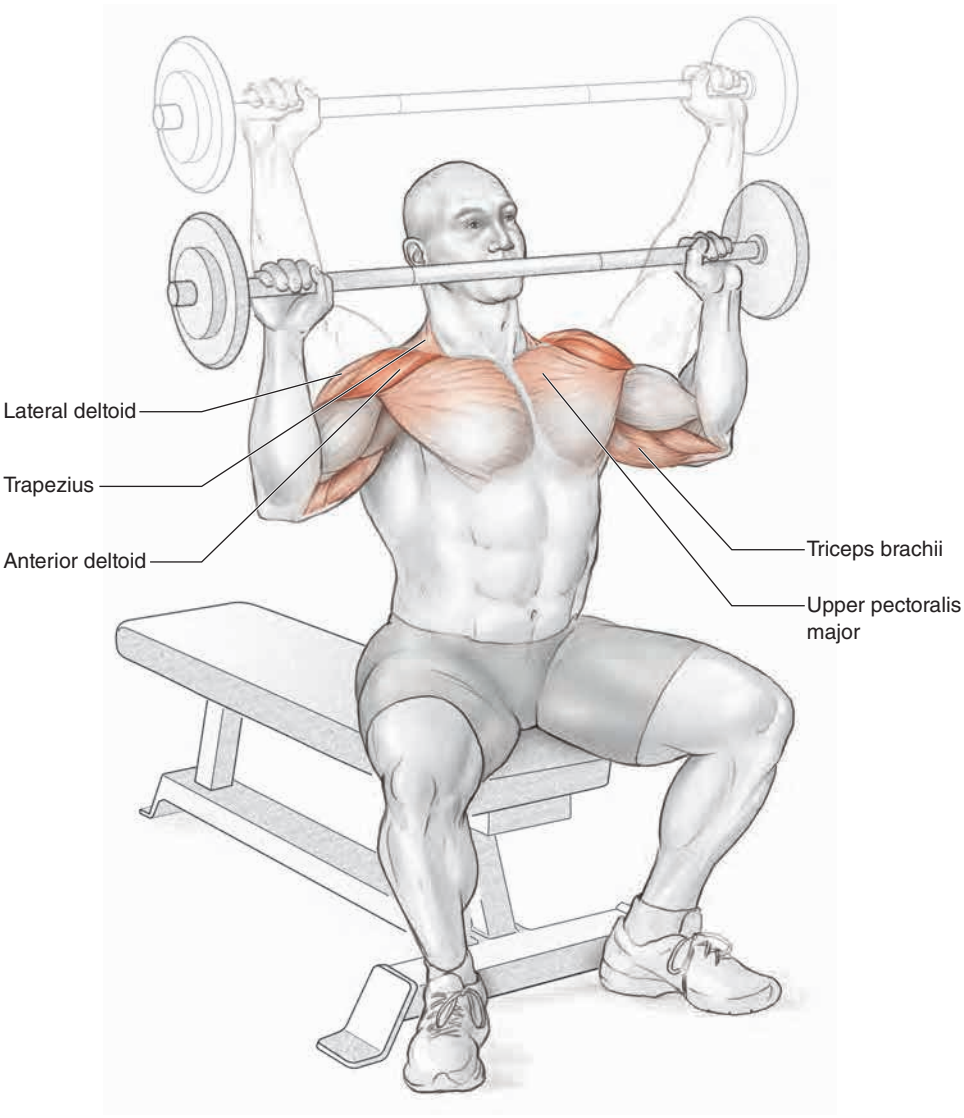


Figure 1.1 Showcasing the shoulders.

The rotator cuff is a group of four muscles that form a protective sleeve around the shoulder joint. Despite being barely visible, the rotator cuff is essential for shoulder stability and strength. All four muscles originate from the scapula (shoulder blade) and pass across the shoulder joint to attach to the humerus bone of the upper arm. The supraspinatus lies above the joint and raises (abducts) the arm up and outward—as when hailing a taxi. The infraspinatus and teres minor are located behind the joint and act to rotate the arm out—as when hitchhiking. The subscapularis is situated in front of the joint and rotates the arm inward—as when folding your arms across your chest.

BARBELL SHOULDER PRESS



Execution

1. Seated on a bench, take a shoulder-width grip on the bar with your palms facing forward.
2. Lower the weight slowly in front until it touches your upper chest.
3. Push vertically upward until your elbows lock out.

Muscles Involved

Primary: Anterior deltoid

Secondary: Lateral deltoid, triceps brachii, trapezius, upper pectoralis major

Anatomic Focus

Hand spacing: A shoulder-width grip is preferred to target the anterior deltoid. Wider grips on the bar minimize triceps contribution, but as the grip gets wider the risk of shoulder injury increases.

Range of motion: A shorter repetition terminating the press just before lockout keeps tension on the deltoid by reducing the involvement of the triceps during lockout.

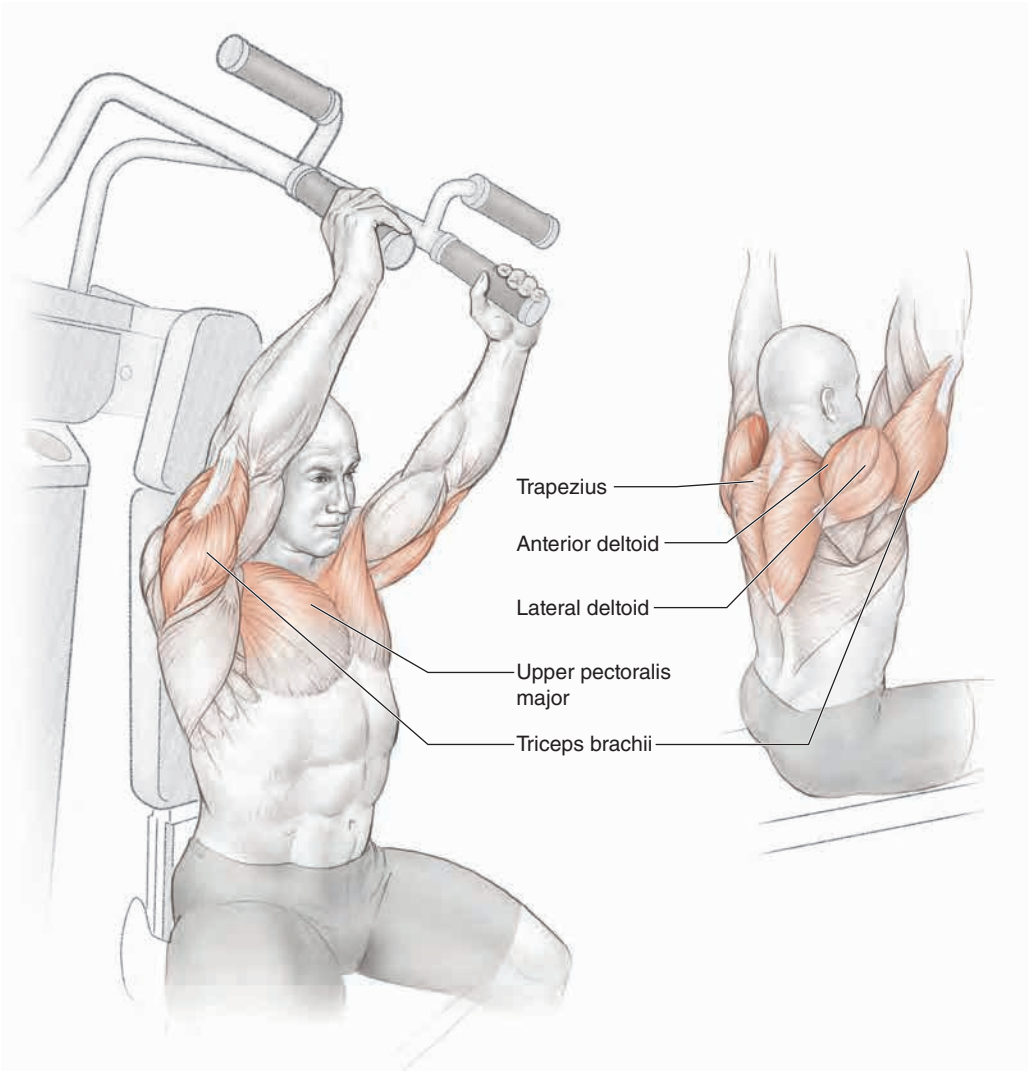
Positioning: Performing the exercise while seated upright is stricter than performing the exercise while standing because it prevents cheating the weight upward using momentum generated by the legs.

VARIATION

Behind-the-Neck Press

This version places the shoulder in more external rotation. However, the risk of shoulder injury is greater when the weight is lifted behind the neck.

MACHINE SHOULDER PRESS



Execution

1. Sit in the machine with your back straight. Grab the handles.
2. Push vertically upward until your elbows lock out.
3. Lower the weight slowly back to shoulder level.

Muscles Involved

Primary: Anterior deltoid

Secondary: Lateral deltoid, triceps brachii, trapezius, upper pectoralis

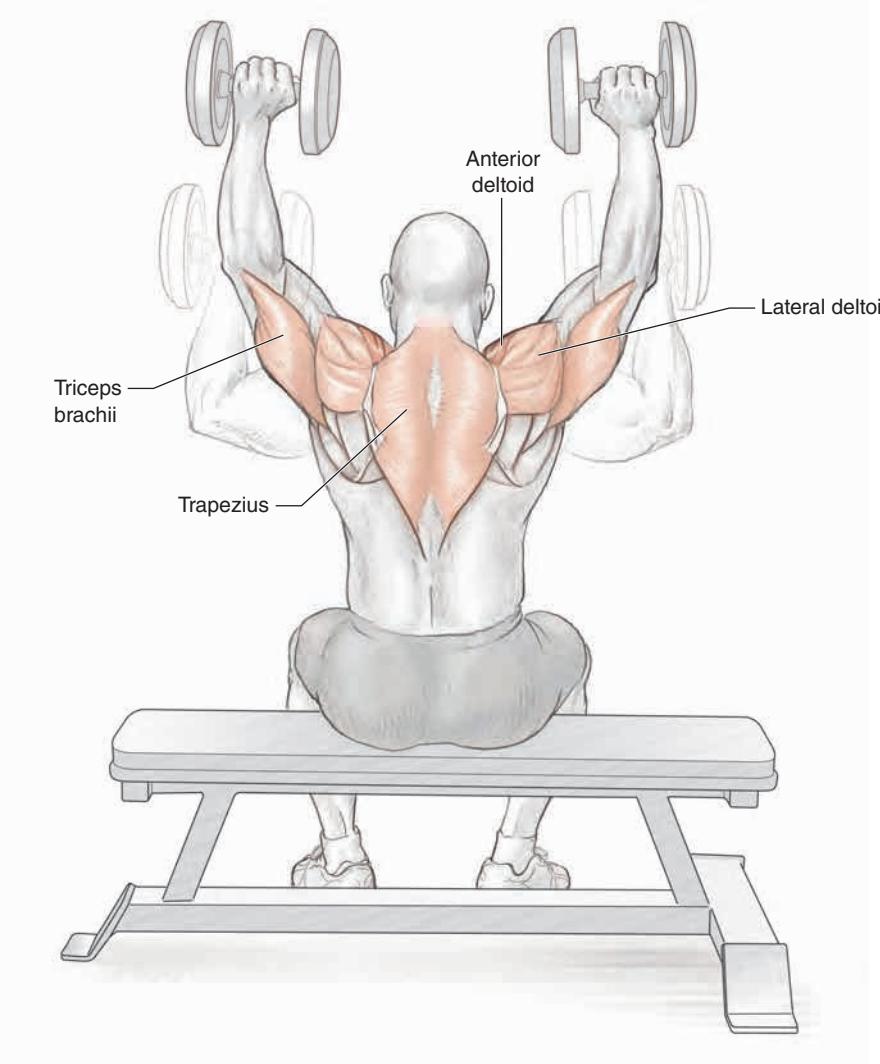
Anatomic Focus

Grip: A neutral grip (palms facing each other) targets the anterior deltoid better than a pronated grip (palms facing forward).

Range of motion: A shorter repetition terminating the press just before lockout keeps tension on the deltoid.

Body position: Depending on the machine, you will sit upright with your spine supported by a backrest.

DUMBBELL SHOULDER PRESS



Execution

1. Seated on a bench, hold a dumbbell in each hand at shoulder level, palms facing forward.
2. Press the dumbbells vertically upward until your elbows lock out.
3. Lower the dumbbells until they touch your shoulders.

Muscles Involved

Primary: Anterior deltoid

Secondary: Lateral deltoid, triceps brachii, trapezius, upper pectoralis

Anatomic Focus

Grip: Changing the orientation of the dumbbells affects hand position (grip). Pressing the dumbbells up with palms facing forward (pronated grip) works both the anterior and lateral heads of the deltoid. Pressing the dumbbells with palms facing together (neutral grip) makes the anterior deltoid work harder, minimizing involvement of the lateral head. Holding the dumbbells with palms facing back (supinated grip) maximizes anterior deltoid effort.

Positioning: Performing the exercise while seated upright is stricter than performing the exercise while standing because it prevents cheating the dumbbells upward using momentum generated by the legs.

VARIATIONS

Variable-Grip Dumbbell Press

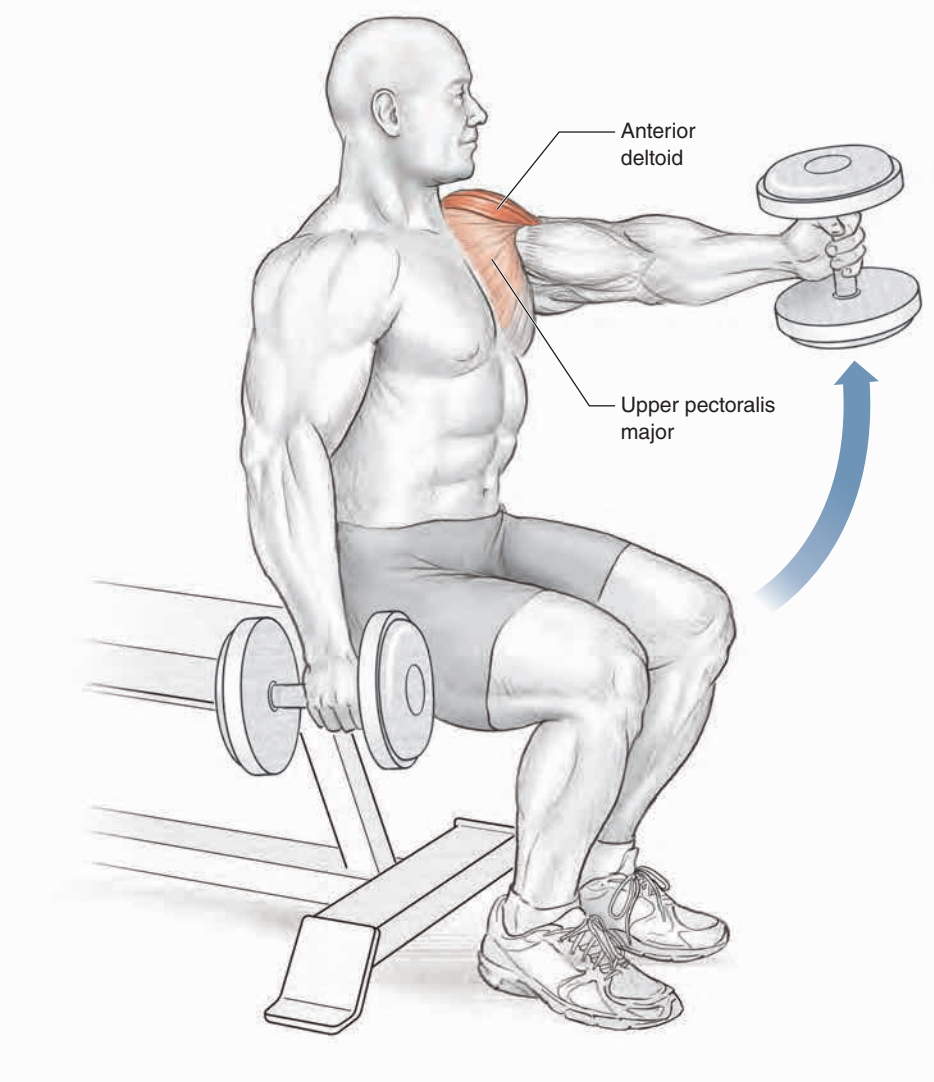
This version uses three different hand positions during the repetition. Begin the exercise by holding the dumbbells with your palms facing back (supination). During the press, rotate the dumbbells so your palms face together (neutral grip) at the midpoint. Finish the upward press with your palms facing forward (pronated grip) at lockout.



Alternating One-Arm Dumbbell Press

Perform the exercise by pressing one dumbbell at a time, alternating between the right arm and the left arm.

DUMBBELL FRONT RAISE



Execution

1. Sitting upright on the edge of an exercise bench, hold a dumbbell in each hand at arms' length by your sides, thumbs pointing forward.
2. Lift one dumbbell out in front of your body and up toward shoulder level, keeping your elbow stiff.
3. Lower the weight to the starting position and repeat with the other dumbbell.

Muscles Involved

Primary: Anterior deltoid

Secondary: Upper pectoralis, trapezius

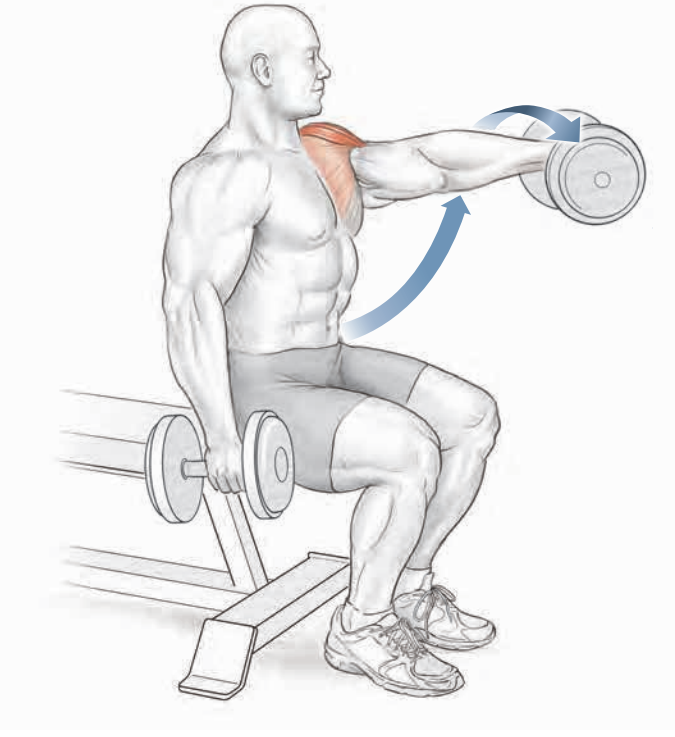
Anatomic Focus

Grip: A neutral grip (palm inward, thumb pointing forward) emphasizes the anterior deltoid. A pronated grip (palm down) allows the lateral deltoid to assist.

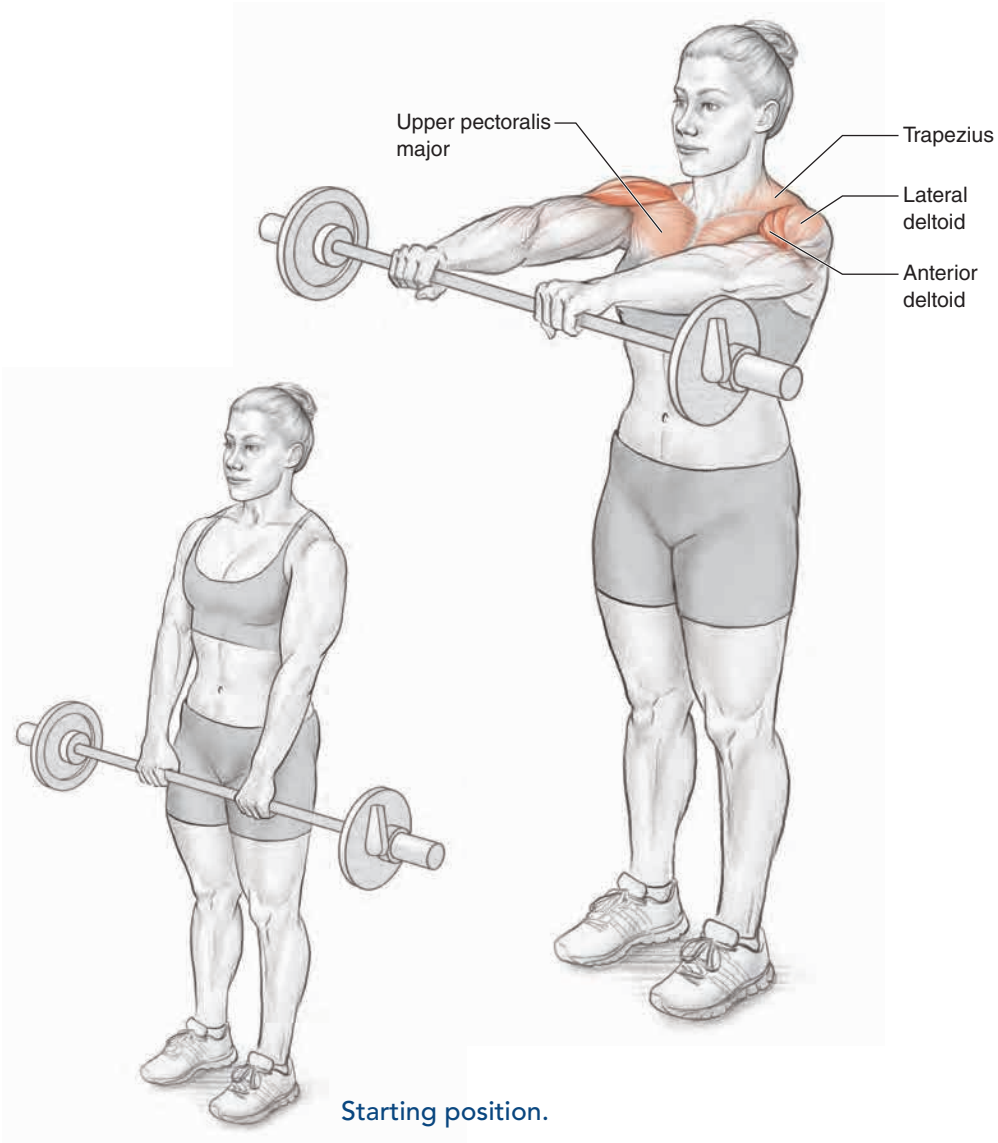
VARIATION

Variable-Grip Dumbbell Front Raise

Begin with a neutral grip (thumb forward). During the lift, rotate the dumbbell through 90 degrees so that your grip is pronated (palm down) at the top of the movement.



BARBELL FRONT RAISE



Starting position.

Execution

1. Using an overhand shoulder-width grip, hold a barbell at arms' length in front of your thighs.
2. Raise the barbell forward and upward to shoulder level, keeping your elbows stiff.
3. Lower the barbell to your thighs.

Muscles Involved

Primary: Anterior deltoid

Secondary: Lateral deltoid, trapezius, upper pectoralis

Anatomic Focus

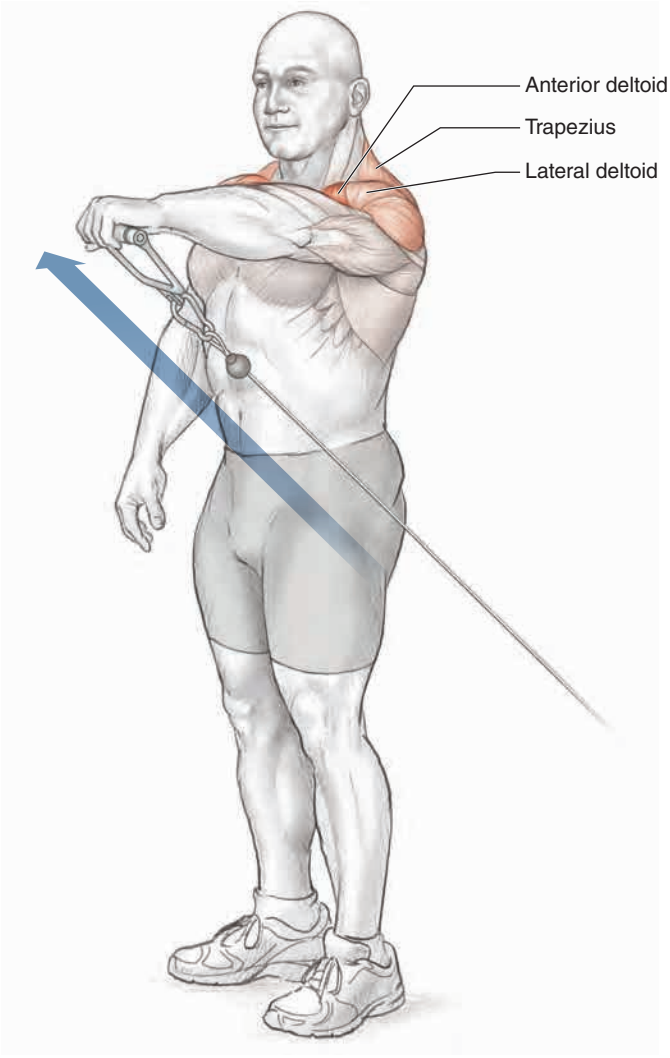
Hand spacing: Narrow hand spacing emphasizes the anterior deltoid, whereas a wider grip requires assistance from the lateral deltoid.

VARIATION

Single Dumbbell Front Raise

Grab a dumbbell with both hands, interlocking your fingers around the handle. The neutral grip (thumbs pointing forward) and narrow hand spacing target the anterior deltoid, minimizing involvement of the lateral deltoid.

CABLE FRONT RAISE



Execution

1. With one hand, grab the D-handle attached to a low pulley using a pronated grip (palm down).
2. Facing away from the weight stack, raise the handle in an upward arc to shoulder level, keeping your elbow stiff.
3. Lower the handle to waist level.

Muscles Involved

Primary: Anterior deltoid

Secondary: Lateral deltoid, trapezius, upper pectoralis major

Anatomic Focus

Grip: The pronated overhand grip works the anterior and lateral heads of the deltoid.

VARIATIONS

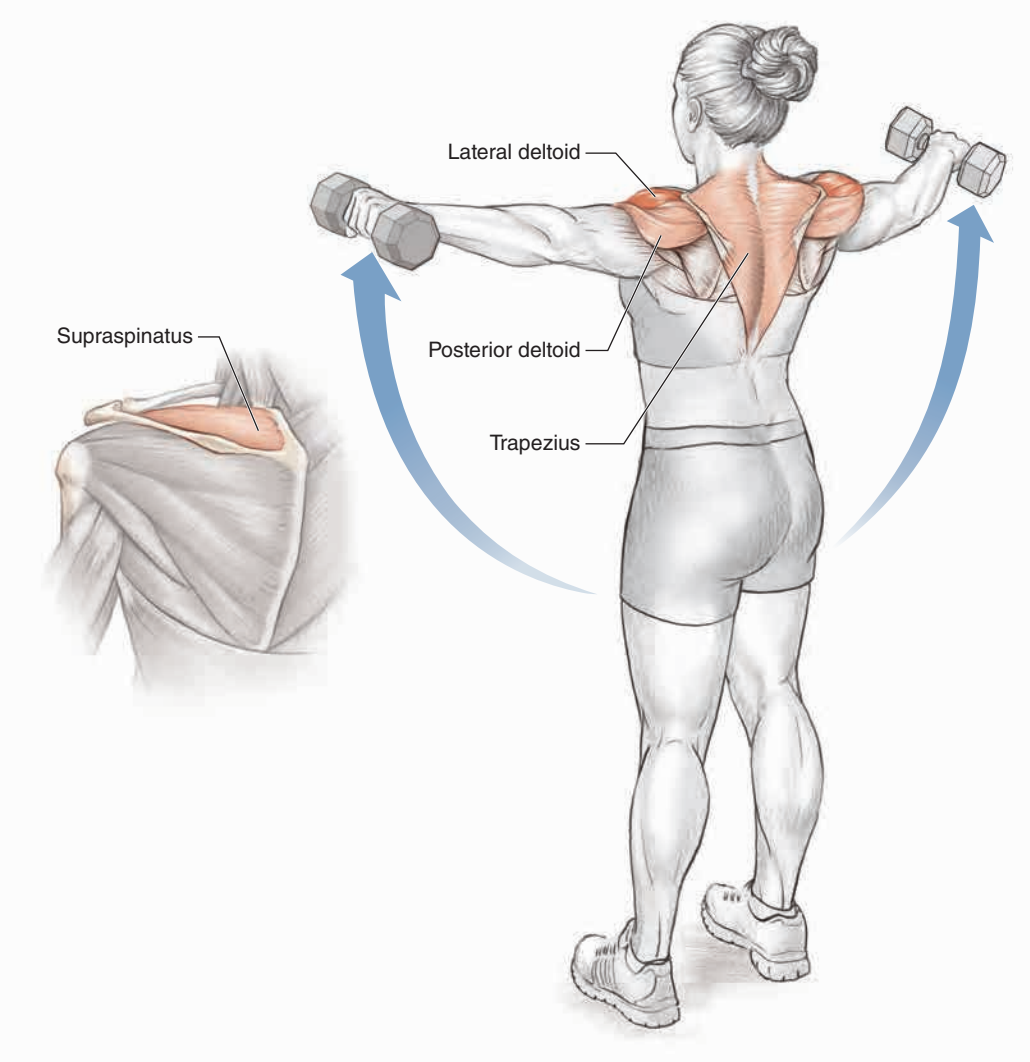
Short-Bar Attachment

Facing away from the machine with the cable running between your legs, grab the bar with both hands using a shoulder-width overhand grip.

Rope Attachment

Facing away from the machine with the cable running between your legs, grab the rope ends with both hands, thumbs pointing upward.

DUMBBELL STANDING LATERAL RAISE



Execution

1. Standing upright, hold a dumbbell in each hand at arms' length.
2. Raise your arms out to the sides in an arc until the dumbbells reach shoulder level.
3. Lower the dumbbells to your hips.

Muscles Involved

Primary: Lateral deltoid

Secondary: Anterior deltoid, posterior deltoid, trapezius, supraspinatus

Anatomic Focus

Range of motion: The lateral deltoid performs most of the work as the dumbbells are raised to shoulder level. The trapezius takes over if the dumbbells are raised higher, so terminating the upward phase at shoulder level keeps tension on the deltoid.

Grip: Effort from the lateral deltoid is maximized when the dumbbells are held parallel to the floor. Tilting the dumbbells with thumbs up externally rotates the shoulder and makes the anterior deltoid contribute to the motion, whereas tilting the dumbbells with thumbs down internally rotates the shoulder, allowing the posterior deltoid to assist.

Trajectory: Lifting the dumbbells directly out to the sides hits the lateral deltoid. Raising the dumbbells from in front of the hips with a forward arc makes the anterior deltoid assist. If the arc of motion occurs behind the plane of the body, then the posterior deltoid contributes to the lift.

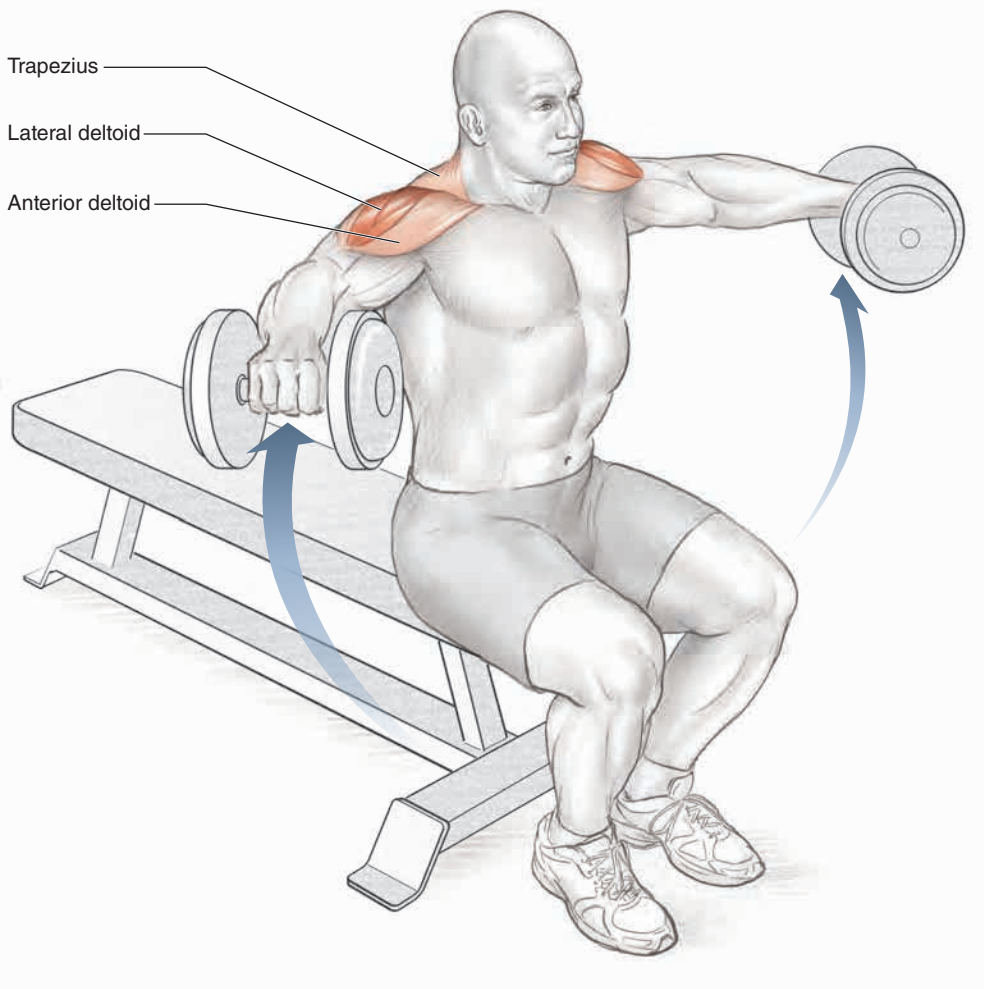
Resistance: Because of the effect of gravity on the dumbbells, resistance is lower at the beginning of the movement and gradually increases to a maximum as the dumbbells are raised to shoulder level.

VARIATION

One-Arm Dumbbell Lateral Raise

Perform this exercise using one arm at a time, stabilizing your torso with your free hand on your hip.

DUMBBELL SEATED LATERAL RAISE



Execution

1. Sitting upright on a bench, hold a dumbbell in each hand at arms' length.
2. Raise your arms out to the sides in an arc until the dumbbells reach shoulder level.
3. Lower the dumbbells to the starting position.

Muscles Involved

Primary: Lateral deltoid

Secondary: Anterior deltoid, posterior deltoid, trapezius, supraspinatus

Anatomic Focus

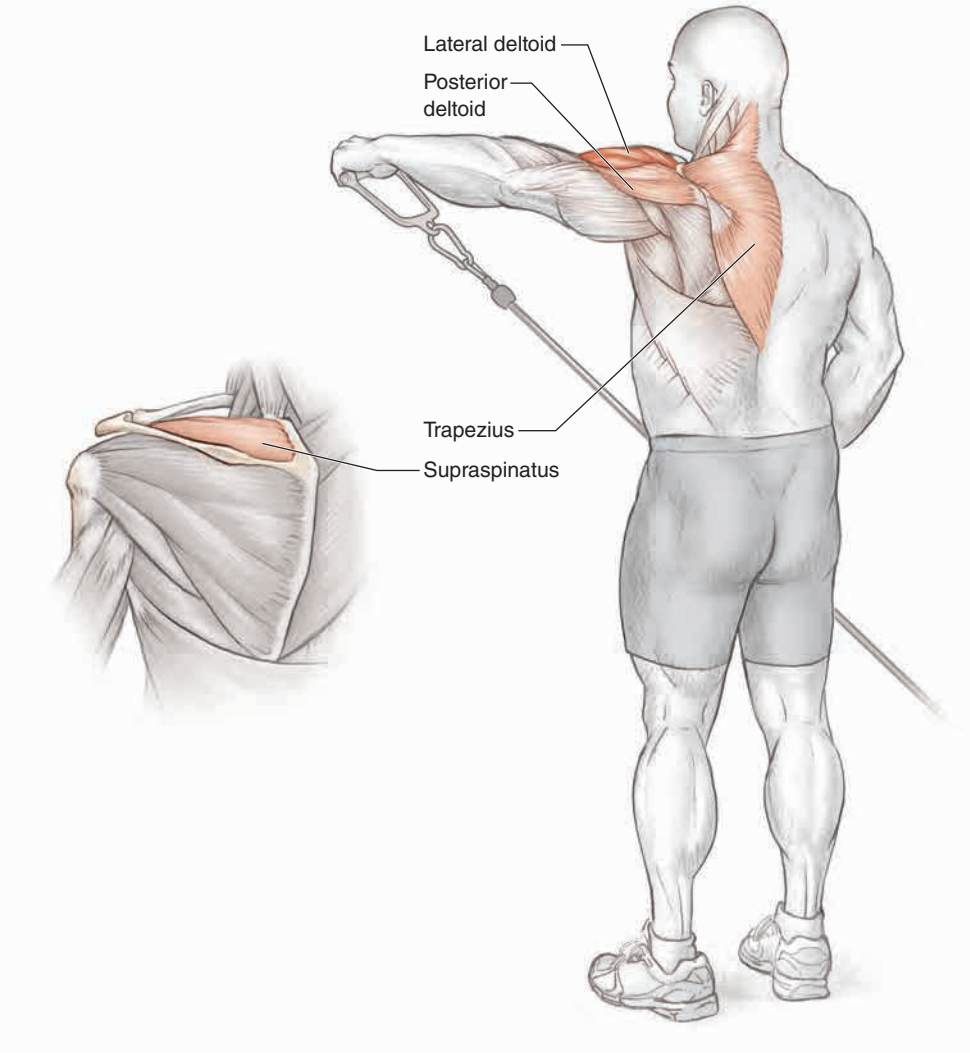
Body position: Performing the dumbbell lateral raise seated on a flat exercise bench is stricter than performing the exercise standing up because it minimizes the use of momentum to swing the dumbbells up. A vertical backrest can be used to support your torso and reduce stress across the lower back.

Range of motion: Terminating the upward phase at shoulder level keeps tension on the lateral deltoid. If the dumbbells are raised higher, the trapezius takes over the work.

Grip: Effort from the lateral deltoid is maximized when the dumbbells are held parallel to the floor. Tilting the dumbbells with thumbs up externally rotates the shoulder and makes the anterior deltoid contribute to the motion, whereas tilting the dumbbells with thumbs down internally rotates the shoulder, allowing the posterior deltoid to assist.

Resistance: Because of the effect of gravity on the dumbbells, resistance is lower at the beginning of the movement and gradually increases to a maximum as the dumbbells are raised to shoulder level.

CABLE LATERAL RAISE



Execution

1. With one hand, grasp the D-handle attached to a low pulley. Stand side-on to the cable machine.
2. Raise your hand outward in a wide arc up to shoulder level, keeping your elbow stiff.
3. Lower the handle back down to waist level.

Muscles Involved

Primary: Lateral deltoid

Secondary: Anterior deltoid, posterior deltoid, trapezius, supraspinatus

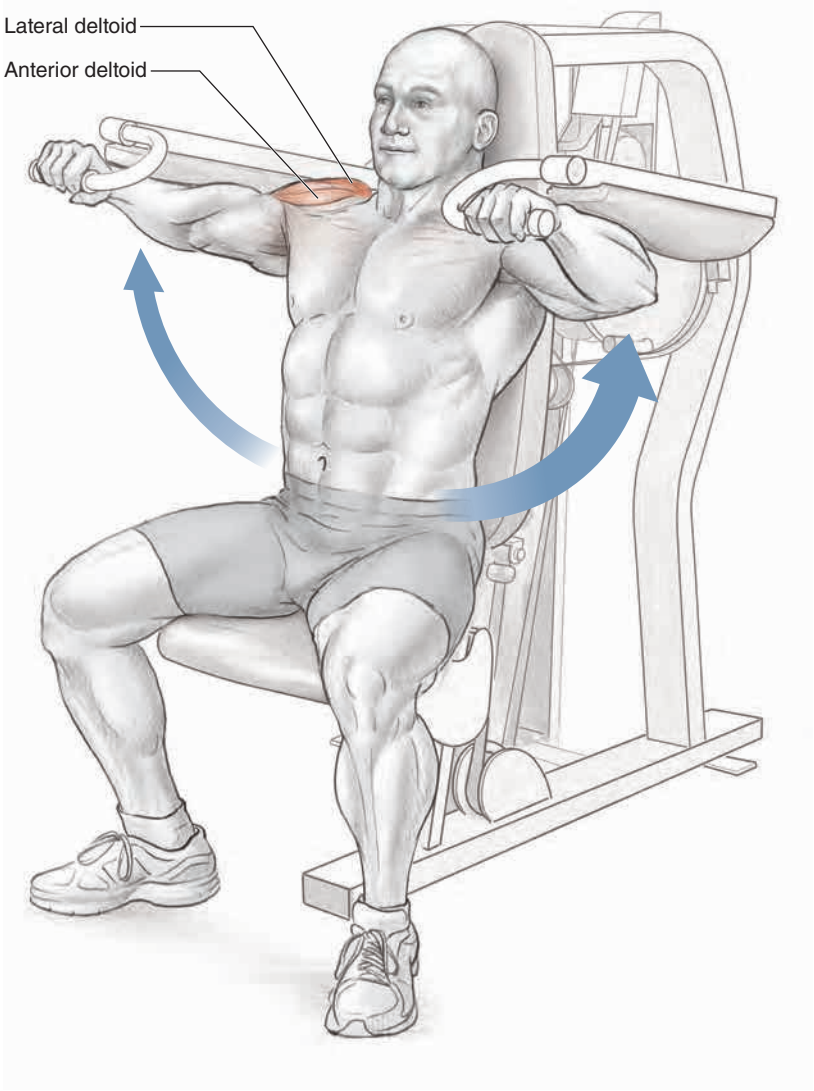
Anatomic Focus

Range of motion: Terminating the upward phase at shoulder height keeps tension on the lateral deltoid. If the handle is raised higher, the trapezius takes over the work. The supraspinatus assists the lateral deltoid during the first 30 degrees of the movement. Starting the repetition with your hand in front of the opposite thigh can increase the range of motion by extending the early phase of the movement.

Trajectory: The lateral deltoid is targeted best when the hand is raised directly out to the side. Performing the raise in front of the plane of your body activates the anterior deltoid, whereas raising your hand from the rear activates the posterior deltoid.

Resistance: Unlike dumbbell lateral raises, where the resistance varies during the lift, the cable pulley provides uniform resistance throughout the motion.

MACHINE LATERAL RAISE



Execution

1. Sit on the machine with your elbows against the pads. Grasp the handles.
2. Raise your elbows until your upper arms are at shoulder level and parallel to the floor.
3. Lower your elbows to your sides.

Muscles Involved

Primary: Lateral deltoid

Secondary: Anterior deltoid, posterior deltoid, trapezius, supraspinatus

Anatomic Focus

Range of motion: Machine raises provide a uniform resistance throughout the movement. The supraspinatus assists at the start, and the trapezius assists if the elbows are raised above shoulder level.

Grip: A pronated grip (palms down) internally rotates the shoulder and targets the lateral deltoid. A neutral grip (palms facing in) or supinated grip (palms up) externally rotates the shoulder and increases the contribution of the anterior deltoid. Changes in shoulder rotation are made easier by gripping the elbow pads and not holding the machine's handles.

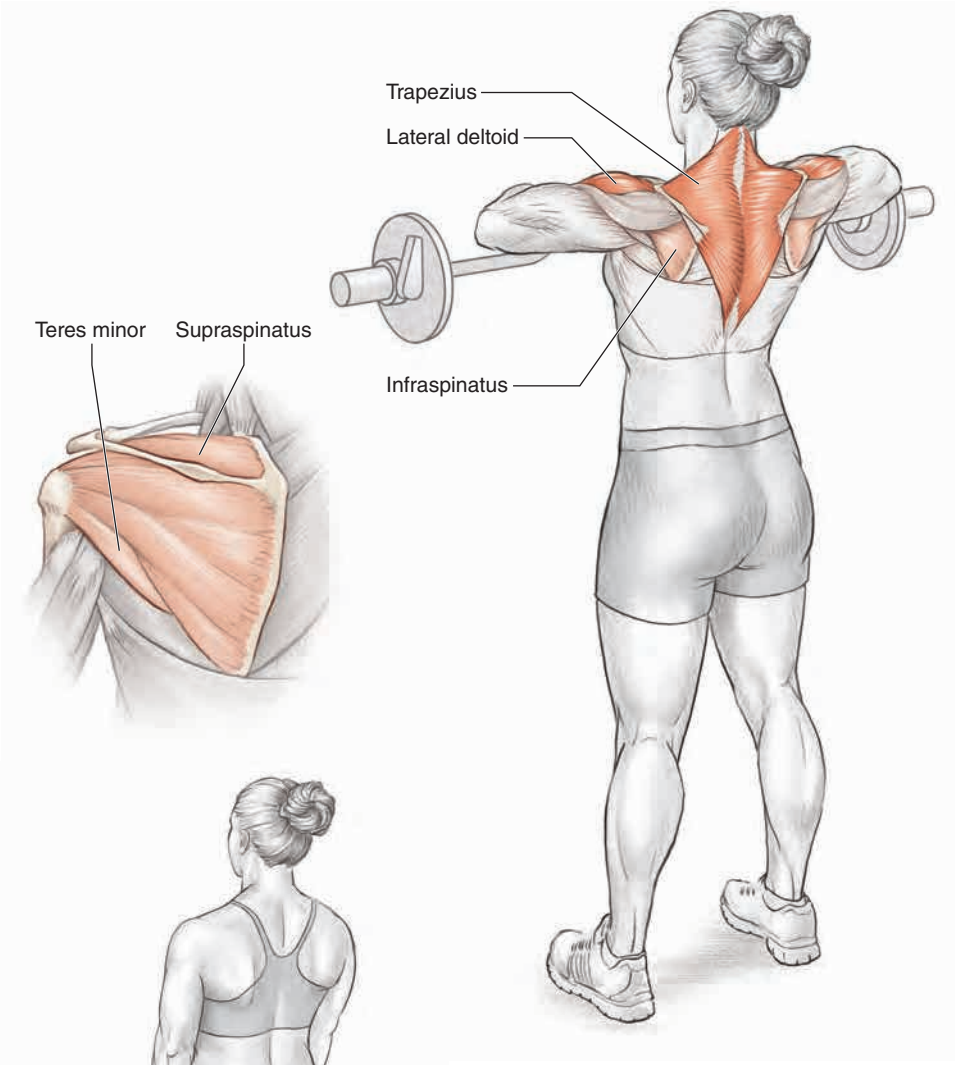
Trajectory: Altering the trajectory of the lift changes the relative focus on the deltoid. Raising your elbows directly out to the sides hits the lateral deltoid. Performing the raise with your elbows positioned forward on the pads makes the anterior deltoid assist.

VARIATION

One-Arm Machine Lateral Raise

Perform this exercise using one arm at a time to improve focus and isolation. Some machines are designed so that you face inward, stabilizing your torso against a chest pad.

BARBELL UPRIGHT ROW





Starting position.

Execution

1. Hold a barbell at arms' length using an overhand shoulder-width grip.
2. Pull the bar vertically upward, raising your elbows to shoulder height.
3. Lower the bar slowly down to the starting position with the arms extended.

Muscles Involved

Primary: Lateral deltoid, trapezius

Secondary: Anterior deltoid, supraspinatus, infraspinatus, teres minor

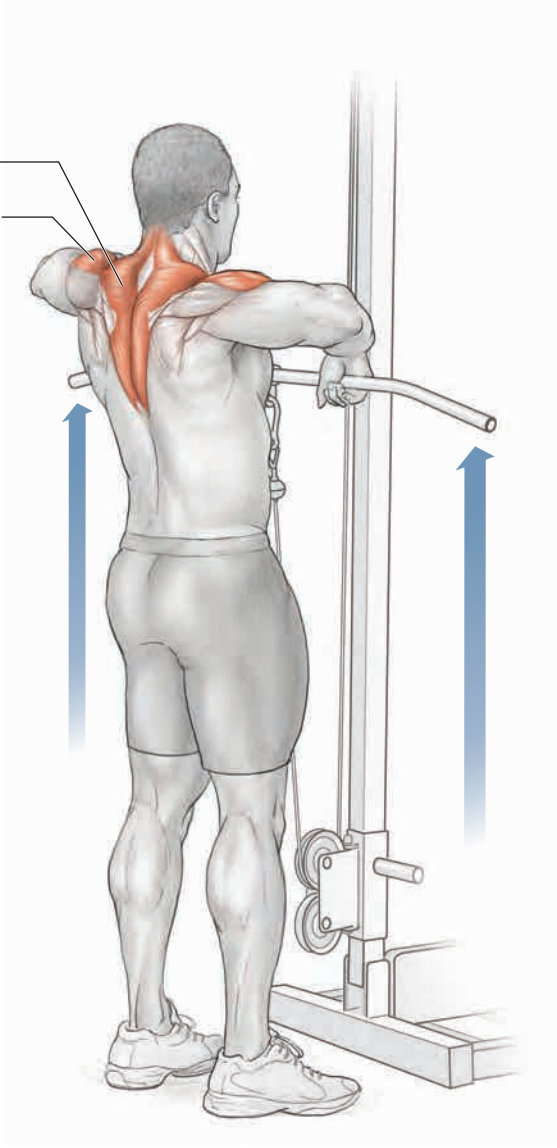
Anatomic Focus

Hand spacing: Taking a wider grip on the bar helps target the deltoid, whereas a narrower grip emphasizes the trapezius.

Trajectory: Lifting the barbell close to the body targets the lateral deltoid, whereas raising the bar through a forward arc away from the body requires assistance from the anterior deltoid.

Range of motion: If the elbows are raised above shoulder level, the trapezius takes over the work.

CABLE UPRIGHT ROW



Execution

1. Grab a straight bar attached to the low pulley of a cable machine. Hold the bar at arms' length using an overhand shoulder-width grip.
2. Pull the bar vertically upward, raising your elbows to shoulder height.
3. Lower the bar slowly to the starting position with the arms extended.

Muscles Involved

Primary: Lateral deltoid, trapezius

Secondary: Anterior deltoid, supraspinatus

Anatomic Focus

Hand spacing: Taking a wider grip on the bar helps target the deltoid, whereas a narrower grip emphasizes the trapezius.

Range of motion: If the elbows are raised above shoulder level, the trapezius takes over the work.

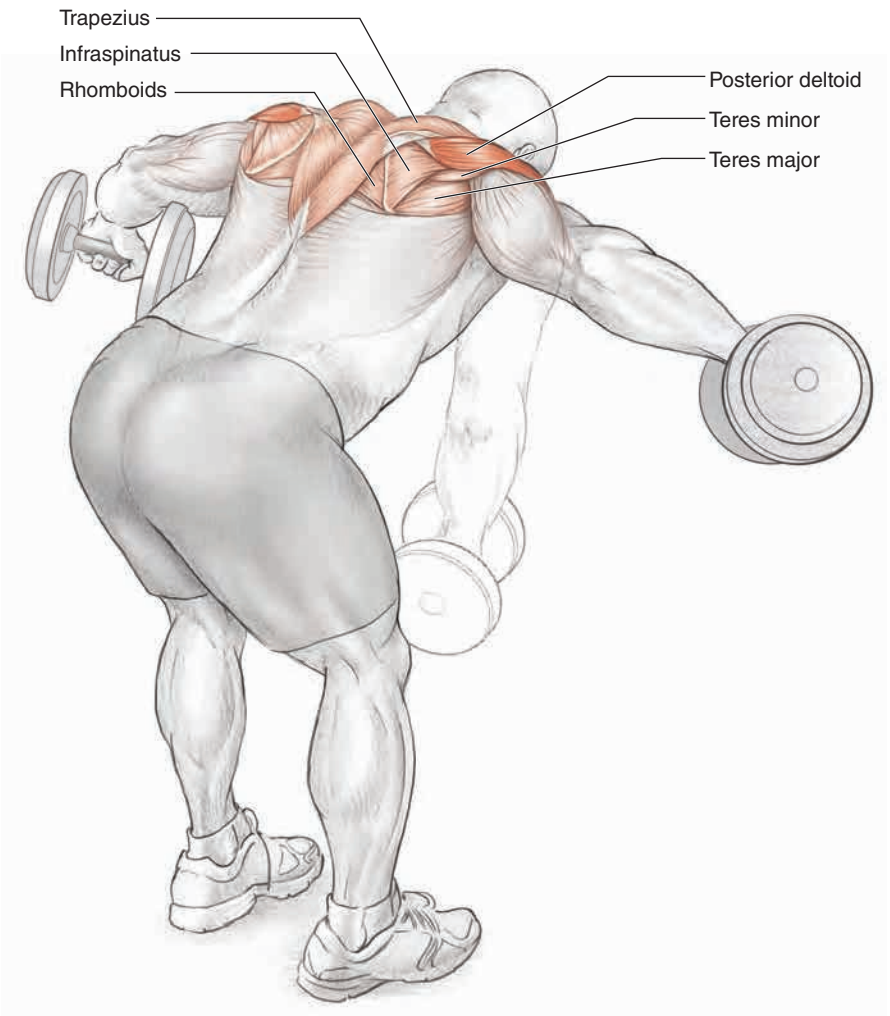
Body position: With the torso upright, effort is focused on the lateral deltoid. If the torso is tilted forward, the posterior deltoid assists in the movement.

VARIATION

Machine Upright Row

Using a Smith machine provides a single plane of vertical motion that may help focus your effort. (See the section titled “Upper Back” in chapter 3.)

DUMBBELL BENT-OVER RAISE



Execution

1. Holding a dumbbell in each hand at arms' length, bend forward at the waist, keeping your back straight and head up.
2. With palms facing each other, raise the dumbbells to ear level, keeping your elbows slightly bent.
3. Lower the dumbbells to the starting position.

Muscles Involved

Primary: Posterior deltoid

Secondary: Lateral deltoid, trapezius, rhomboids, infraspinatus, teres minor, teres major

Anatomic Focus

Grip: The way you hold the dumbbells influences the degree of rotation at the shoulder joint. Holding the dumbbells using a neutral grip (thumbs pointing forward) allows the lateral deltoid to work. A pronated grip on the dumbbells (thumbs pointing inward) targets the posterior deltoid because the shoulder is rotated internally and the action of the lateral deltoid is reduced.

Resistance: Because of the effect of gravity on the dumbbells, the resistance is lower at the beginning of the movement and gradually increases to a maximum as the dumbbells are raised.

Trajectory: Altering the trajectory of the lift changes the relative focus on the deltoid. With your torso flat and parallel to the floor, emphasis is placed on the posterior deltoid. If your torso is inclined with your chest upright, the lateral deltoid contributes to the movement.

VARIATION

Head-Supported Dumbbell Raise

Stand behind and in line with an incline exercise bench. Bend forward at the waist until your head touches the top of the backrest, which should be set at a height that allows your torso to be almost parallel to the floor. Supporting your head restricts movement in the spine and prevents using momentum to swing the dumbbells up.

DUMBBELL SEATED BENT-OVER RAISE



Execution

1. Holding a dumbbell in each hand at arms' length, sit on the end of a bench. Bend forward at the waist and rest your chest on your thighs.
2. With palms facing back (thumbs pointing inward), raise the dumbbells to ear level, keeping your elbows slightly bent.
3. Lower the dumbbells to the starting position.

Muscles Involved

Primary: Posterior deltoid

Secondary: Lateral deltoid, trapezius, rhomboids, infraspinatus, teres minor, teres major

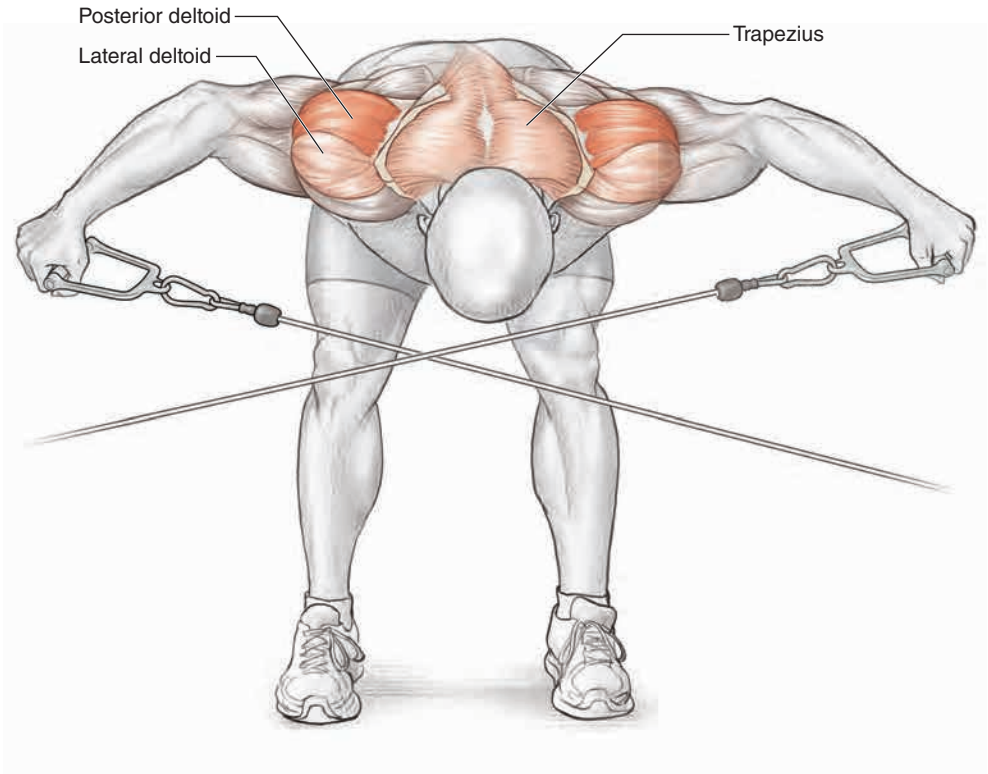
Anatomic Focus

Grip: The way you hold the dumbbells influences the degree of rotation at the shoulder joint. A pronated grip on the dumbbells (thumbs pointing in) targets the posterior deltoid because the shoulder is rotated internally and the action of the lateral deltoid is reduced. Holding the dumbbells using a neutral grip (thumbs pointing forward) allows the lateral deltoid to work in the exercise.

Resistance: Because of the effect of gravity on the dumbbells, the resistance is lower at the beginning of the movement and gradually increases to a maximum as the dumbbells are raised.

Trajectory: Altering the trajectory of the lift changes the relative focus on the deltoid. With your torso flat and parallel to the floor, emphasis is placed on the posterior deltoid. If your torso is inclined with your chest upright, the lateral deltoid contributes to the movement.

CABLE BENT-OVER RAISE



Execution

1. Standing in the middle of a cable machine, grab the handles attached to two low pulleys. Hold the left-side handle in your right hand and the right-side handle in your left hand. Bend forward at the waist with your back straight and parallel to the floor.
2. Raise your hands in an arc to shoulder level so that the cables cross over each other.
3. Lower the handles to the starting position so that your right hand is directly in front of your left ankle and your left hand is directly in front of your right ankle.

Muscles Involved

Primary: Posterior deltoid

Secondary: Lateral deltoid, trapezius, rhomboids, infraspinatus, teres minor, teres major

Anatomic Focus

Trajectory: To target the posterior deltoid, your arms should move directly out to the sides. If your hands are raised in a forward arc in front of your head, the trapezius and lateral deltoid contribute to the exercise.

Body position: The posterior deltoid is better isolated when your torso is parallel to the floor, not when it is inclined with your chest and head up.

Range of motion: The range of motion at the start is increased if the hands are allowed to cross over (uncrossing the cables) as the handles are lowered. The added distance and further stretch make the posterior deltoid work harder.

Resistance: Unlike dumbbell raises, where the resistance varies during the lift, the cable pulley affords a uniform resistance throughout the motion.

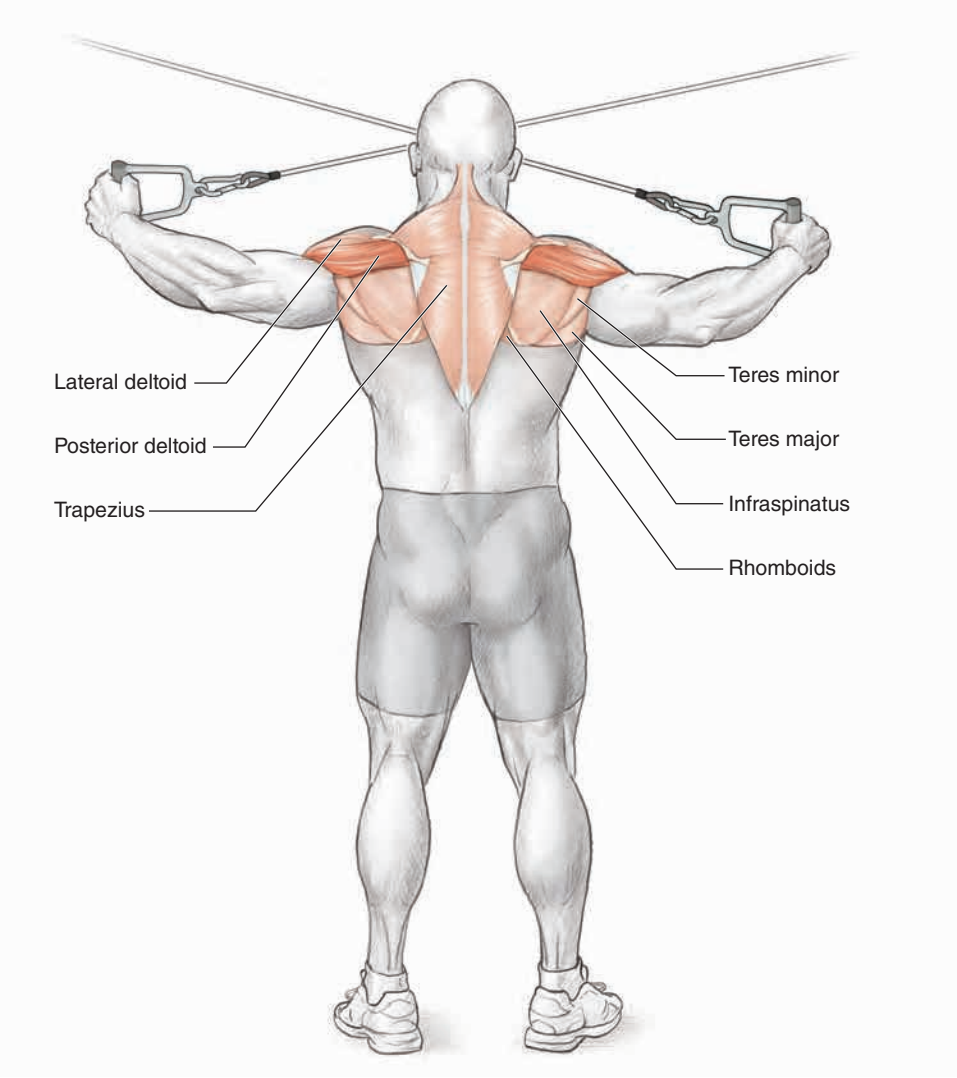
Grip: The cable handle does not allow you to make changes in hand position or grip.

VARIATION

One-Arm Cable Bent-Over Raise

Do this exercise using one arm at a time. This unilateral version makes it possible to raise your hand higher and get a longer stretch at the bottom, thereby generating more work for the posterior deltoid. Stabilize your torso by resting your free hand on your thigh.

CABLE REVERSE CROSSOVER



Execution

1. Stand upright in the middle of a cable machine, facing the pulleys. Using a thumbs-up grip, grab the handles attached to two high pulleys. Hold the left-side handle in your right hand and the right-side handle in your left hand.
2. Pull your hands back and slightly down in an arc, arms nearly parallel to the floor, until your hands are in line with your shoulders, forming a T.
3. Return the handles to the starting position so that your right hand is directly in front of your left shoulder and your left hand is directly in front of your right shoulder.

Muscles Involved

Primary: Posterior deltoid

Secondary: Lateral deltoid, trapezius, rhomboids, infraspinatus, teres minor, teres major

Anatomic Focus

Trajectory: To target the posterior deltoid, your arms should move directly back and slightly down, almost parallel to the floor. If the hands are raised through a higher arc to a point above shoulder level, the trapezius and lateral deltoid make a bigger contribution to the movement.

Body position: The posterior deltoid is best targeted when your torso is upright, not when it is leaning too far forward or back.

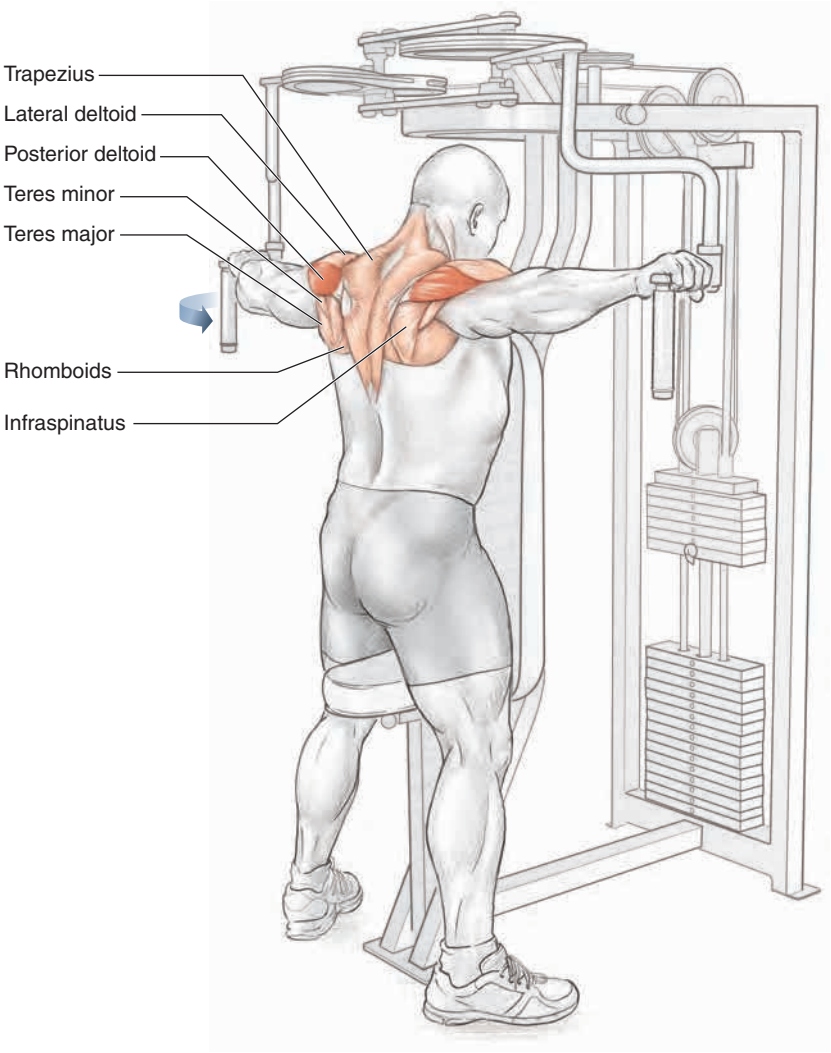
Range: Crossing your hands over one another at the starting position increases the range of motion and muscle stretch, thereby making the posterior deltoid work harder.

VARIATION

Supported Cable Reverse Crossover

You can do this exercise sitting or standing either with the chest supported on the backrest of an incline exercise bench or with the chest against the pad of a preacher bench. Position the bench centrally between two cable pulleys. Whether you sit on the bench or stand over it, you must be positioned high enough to allow your arms to perform the exercise without obstruction. The pulleys should be level with or just higher than your head. This variation is easier on your lower back, so you can focus on working the deltoid.

MACHINE REAR DELTOID FLY



Execution

1. Stand facing the rear deltoid fly machine with your chest against the backrest. Grasp the handles directly in front of your body with arms outstretched at shoulder level.
2. Pull the handles back in an arc as far as possible, keeping your elbows high and arms parallel to the floor.
3. Return the handles to the starting position directly in front of your body.

Muscles Involved

Primary: Posterior deltoid

Secondary: Trapezius, rhomboids, lateral deltoid, infraspinatus, teres minor, teres major

Anatomic Focus

Resistance: Like cable machines, the rear deltoid fly machine provides a uniform resistance throughout the range of motion. This machine also offers several technical adjustments to grip, trajectory, and range of motion to help isolate the posterior deltoid.

Grip: Most modern rear deltoid fly machines provide a choice of handles: one pair horizontal and the other pair vertical. How you hold the handles affects the degree of rotation at the shoulder joint. Using the horizontal handles with a pronated grip (palms down) is the best method of isolating the posterior deltoid because the shoulder is internally rotated. Using the vertical handles with a neutral grip (thumbs up) allows the lateral deltoid to participate because the shoulder is externally rotated.

Trajectory: Altering the trajectory of the lift changes the relative focus on the muscles. The posterior deltoid is worked best when the handles are grasped at or just below shoulder level, with your arms roughly parallel to the floor. If the handles are grasped above shoulder level, with the seat too low, then the trapezius performs a greater portion of the work during the exercise.

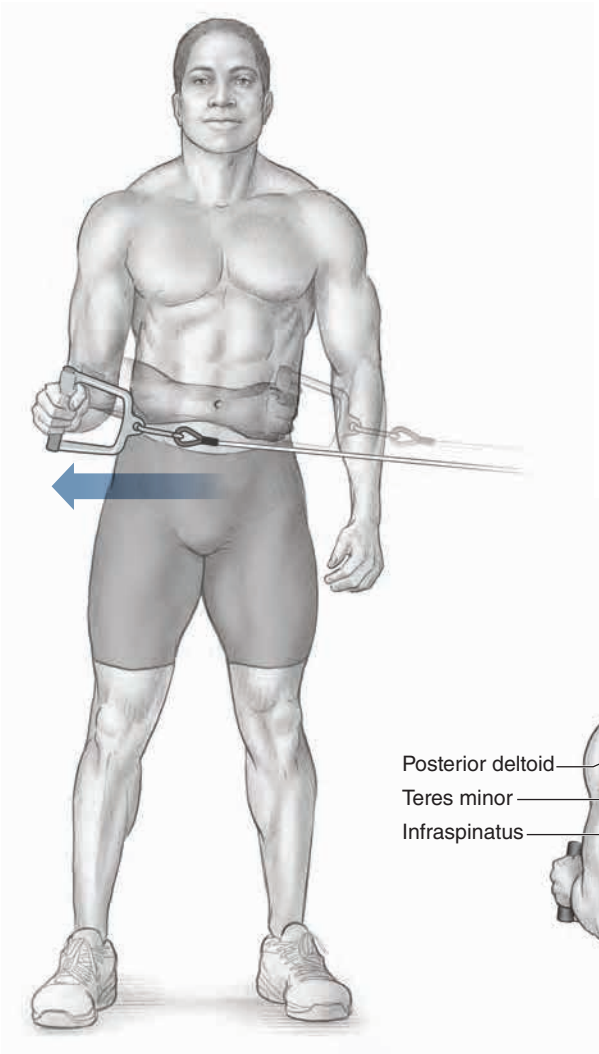
Range: You can increase the range of motion by performing the exercise with one arm at a time (see variation).

VARIATION

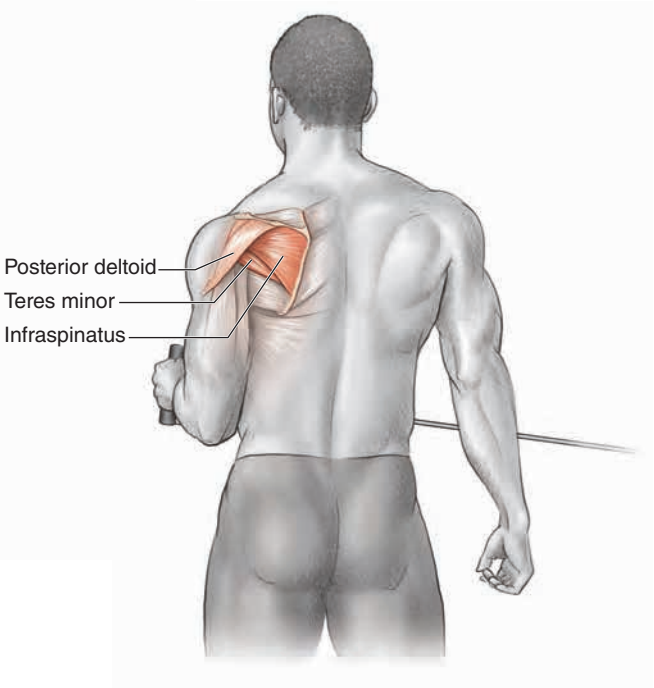
One-Arm Machine Rear Deltoid Fly

Performing this exercise with one arm at a time reduces the relative contribution from the trapezius and the scapular retractor muscles, which thereby aids posterior deltoid isolation. You can also modify the range of motion during the one-arm version by changing your seated position on the machine. Sit side-on with your inner shoulder against the backrest and perform the exercise using the outermost arm. This enables you to begin the exercise from a more distant starting point beyond the opposite shoulder, which provides a greater stretch of the deltoid and increases the effective range of motion by as much as one-third.

EXTERNAL ROTATION



Front view.



Execution

1. Stand side-on to a cable pulley that is adjusted to waist height. Grasp the handle with your outside hand, thumb pointing up.
2. Holding your elbow firmly against your waist, move the handle in an outward arc away from your body, keeping your forearm parallel to the floor.
3. Slowly return the handle to the starting position in front of your navel.

Muscles Involved

Primary: Infraspinatus, teres minor

Secondary: Posterior deltoid

Anatomic Focus

Trajectory: During this movement, external rotation occurs at the shoulder joint from the combined action of the infraspinatus and the teres minor. Your hand moves in a horizontal arc, with the forearm parallel to the floor. The upper arm is vertical, and your elbow is tight against your side.

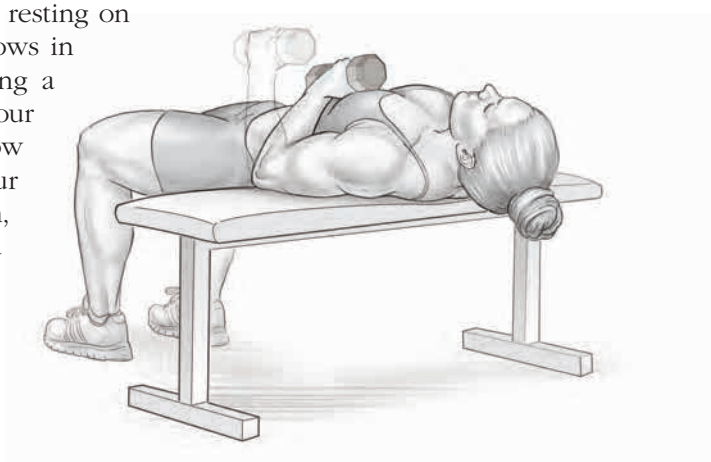
Range: Your hand moves through an arc of approximately 90 degrees, like the hand of a clock moving between 10 and 2 o'clock.

Resistance: You cannot perform this exercise with a dumbbell while standing upright because gravity does not provide resistance for the rotator cuff. In order to use a dumbbell, you will need to lie flat or recline so that gravity acts in the plane of rotator cuff function (see variations).

VARIATIONS

Dumbbell External Rotation

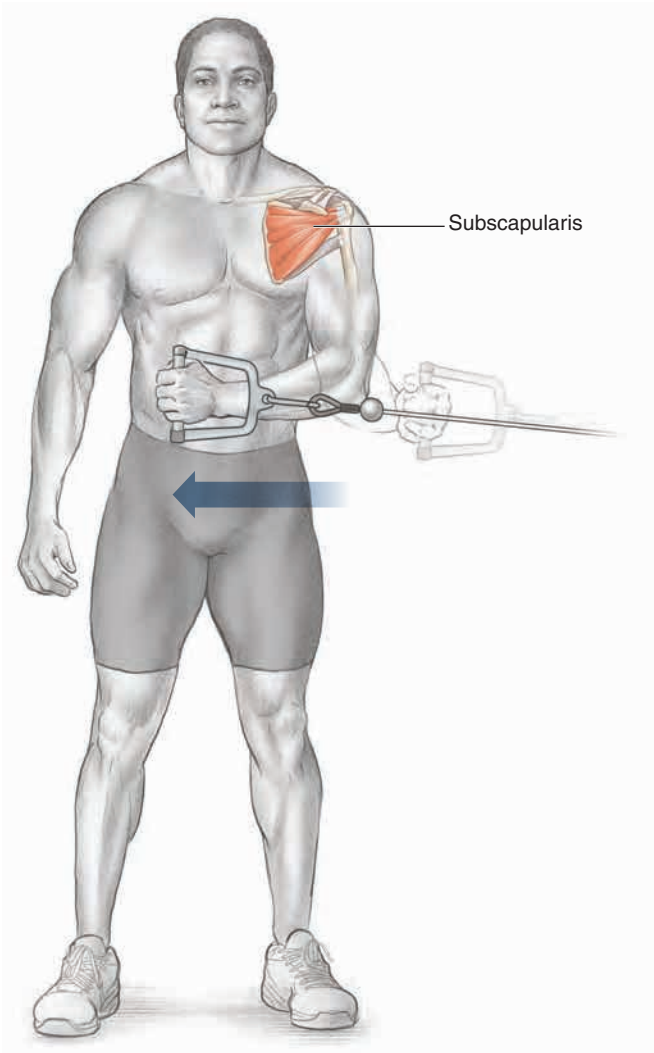
Lie across a flat exercise bench, resting on your upper back with your elbows in contact with the bench. Holding a dumbbell in one hand, position your forearm vertically upward, elbow bent at 90 degrees. Keeping your elbow in contact with the bench, lower the dumbbell in a forward arc toward your waist until your forearm is roughly parallel to the floor.



Reclining Dumbbell External Rotation

Lie side-down on the floor or a flat exercise bench while holding a dumbbell in your upper hand. The body position is similar to that described for the incline side raise later in the chapter.

INTERNAL ROTATION



Execution

1. Stand side-on to a cable pulley that is adjusted to waist height. Grasp the handle with your inside hand, thumb pointing up.
2. Holding your elbow firmly against your waist, pull the handle inward across the front of your body, keeping your forearm parallel to the floor.
3. Slowly return the handle to the starting position.

Muscles Involved

Primary: Subscapularis

Secondary: Pectoralis major

Anatomic Focus

Trajectory: During this movement, the action of the subscapularis causes internal rotation at the shoulder joint. Your hand moves through a horizontal arc across the front of your torso, and the forearm remains parallel to the floor. The elbow and upper arm are held tight against the side of your body.

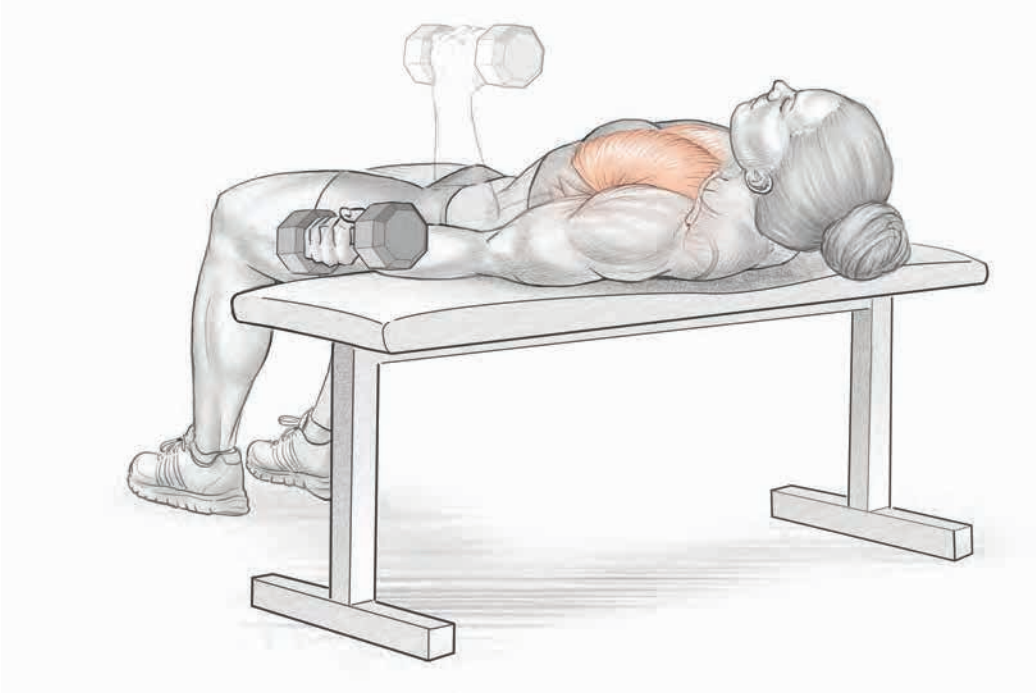
Range: Your hand moves through a 90-degree arc, like the hands of a clock moving between 10 and 2 o'clock.

Resistance: You cannot perform this exercise with a dumbbell while standing upright because gravity does not provide resistance for the rotator cuff. In order to use a dumbbell, you will need to lie flat so that gravity acts in the plane of rotator cuff function (see variation).

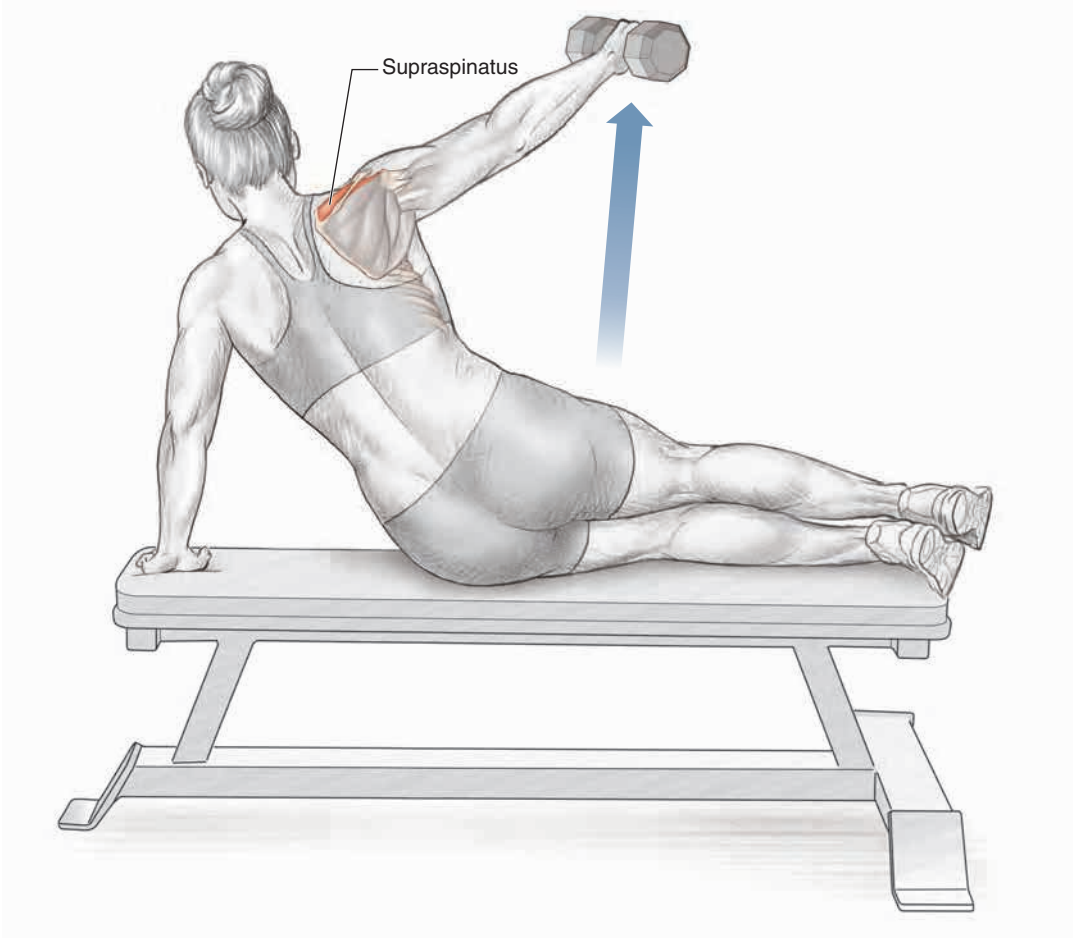
VARIATION

Dumbbell Internal Rotation

Lie across a flat exercise bench, resting on your upper back with your elbows in contact with the bench. Holding a dumbbell in one hand, position your forearm out to the side, almost parallel to the floor. Keeping your elbow bent at 90 degrees and in contact with the bench, raise the dumbbell in a forward arc until your forearm is vertical.



INCLINE SIDE RAISE



Execution

1. Lie sideways on a bench with your torso inclined 45 degrees, supported by your underside arm. Hold a dumbbell with an overhand grip in your other hand.
2. Raise the dumbbell to head height, keeping your elbow stiff.
3. Lower the weight to waist level.

Muscles Involved

Primary: Supraspinatus

Secondary: Lateral deltoid, anterior deltoid

Anatomic Focus

Range: The supraspinatus initiates the arm raise, acting as the primary muscle during the first 15 to 20 degrees of abduction. Gravity on the dumbbell in the inclined position causes resistance to be highest during the early phase of the raise, focusing effort on the supraspinatus.

Trajectory: The supraspinatus is best isolated when the dumbbell is raised from in front of the hips.

Grip: A pronated grip (palm down) works best.

VARIATIONS

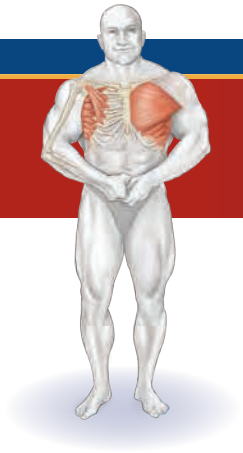
Cable Lateral Raise

The cable lateral raise described earlier in this chapter is a good variation of the incline side raise. The supraspinatus initiates the arm raise and is active during the first 60 degrees of the movement. To focus on the rotator cuff muscle, terminate the upward phase when your hand reaches chest level.

Dumbbell Lateral Raise

The dumbbell lateral raise (either sitting or standing) described earlier in this chapter is a good variation of the incline side raise. You can use one arm at a time or work both simultaneously.

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chapter 2

CHEST

The pectoralis major (figure 2.1) is a fan-shaped muscle that has two anatomic sections, or heads. The upper clavicular head arises from the clavicle (collarbone), and the lower sternal head arises from the sternum (breastbone). The two heads pass outward across the chest wall and merge into a single tendon that attaches to the humerus bone in the upper arm. As the muscle inserts, the tendon twists so that the upper head attaches beneath the lower head. When the pectoralis muscle contracts, movement takes place at the shoulder joint. The pectoralis major adducts, flexes, and internally rotates the arm, thus moving the arm forward and across the chest during movements such as a push-up or a bear hug. Even though the muscle has only two anatomic divisions, functionally it may be considered as having three sections—upper, middle, and lower—depending on the angle through which the arm is moved. As the position of the shoulder joint changes, certain fibers of the chest muscle have a better mechanical advantage for creating motion. Other fibers of the chest muscle are still active but are not able to contract as much because of the shoulder position.

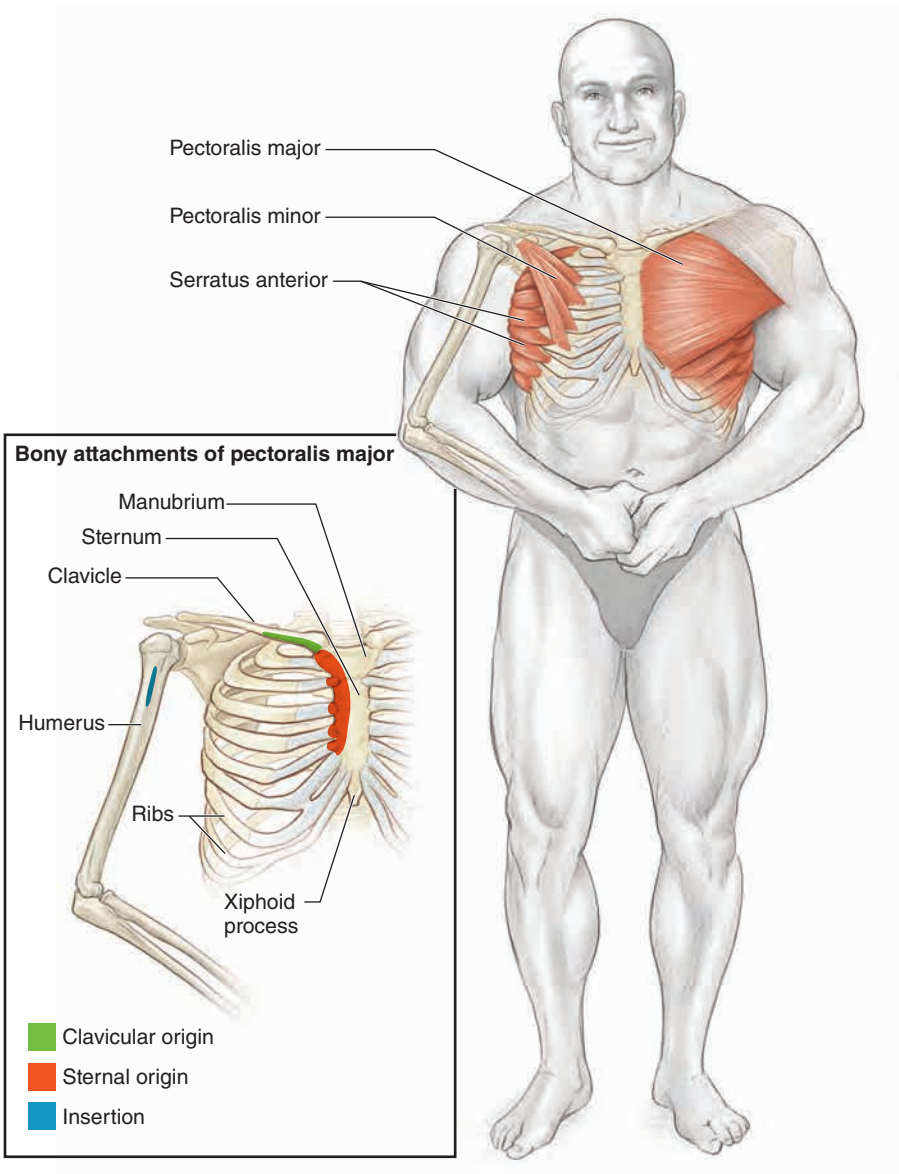
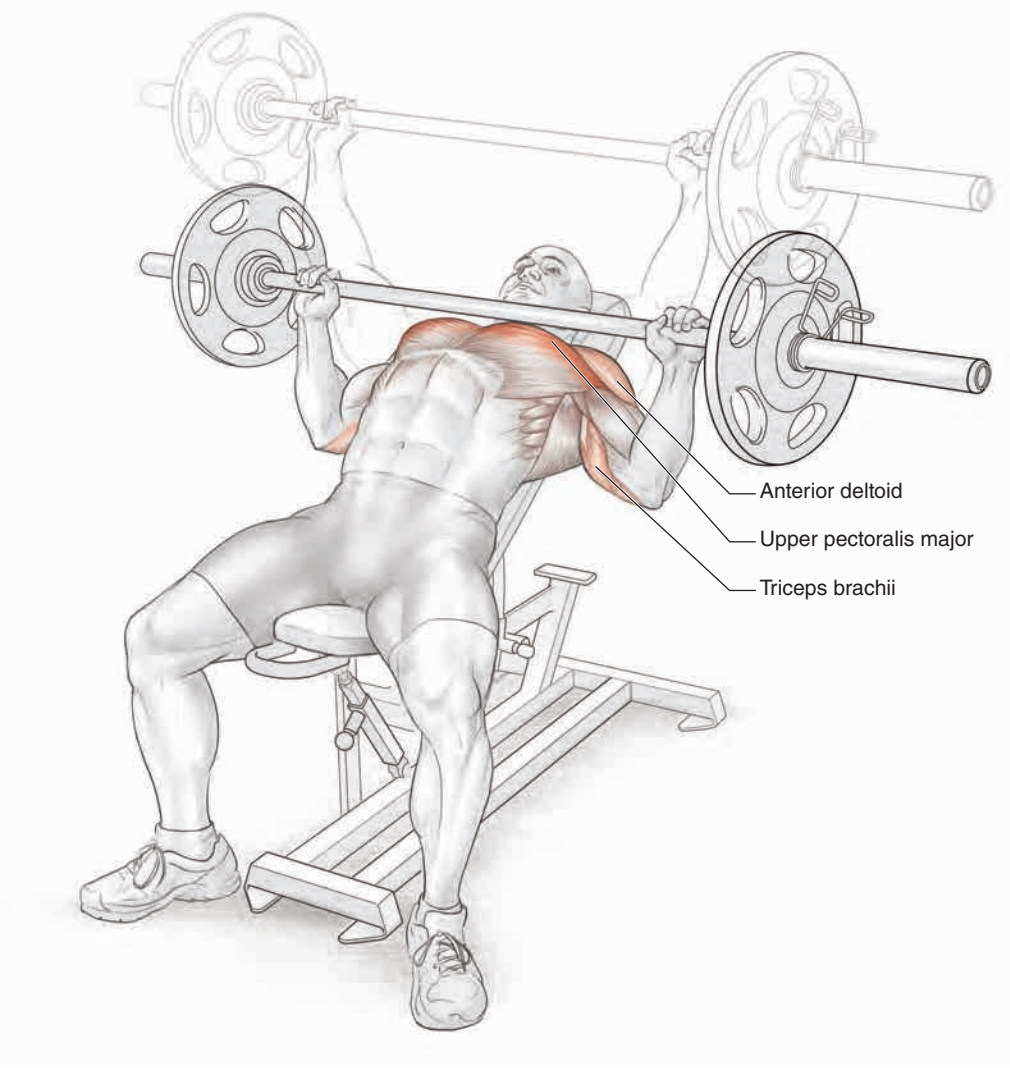


Figure 2.1 Showcasing the chest.

The side wall of the chest is formed by the serratus anterior. This muscle arises from behind the scapula, and it passes forward around the chest wall to attach to the upper eight ribs. The serrated edge of this muscle emerges from beneath the outer margin of the pectoralis muscle. The serratus anterior pulls (protracts) the scapula forward, stabilizing it against the rib cage. The serratus anterior is active during most chest exercises and works especially hard during the lockout phase of a push-up or bench press.

The pectoralis minor muscle lies deep beneath the pectoralis major. It has only a minor function and does not contribute to the size of the chest.

BARBELL INCLINE PRESS



Execution

1. Sitting on an incline bench, take a shoulder-width overhand grip on a barbell.
2. Lower the weight slowly until the bar touches your upper chest.
3. Push the bar straight up until your elbows lock out.

Muscles Involved

Primary: Upper pectoralis major

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Trajectory: The angle of incline determines trajectory. As the backrest is raised and the incline increases, the focus shifts progressively higher up the pectoral muscle. The upper pectoral is best targeted when the backrest is inclined 30 to 45 degrees to the floor. Steeper inclines of 60 degrees or more switch the focus to the anterior deltoid.

Hand spacing: A grip that is shoulder width or slightly wider targets all areas of the upper pectoral muscle. Narrow hand spacing emphasizes the inner central portion of the chest and requires more effort from the triceps. Wider grips provide a greater stretch, targeting the outer portion of the muscle, and minimize triceps contribution. However, as hand spacing increases, so does the risk of injury.

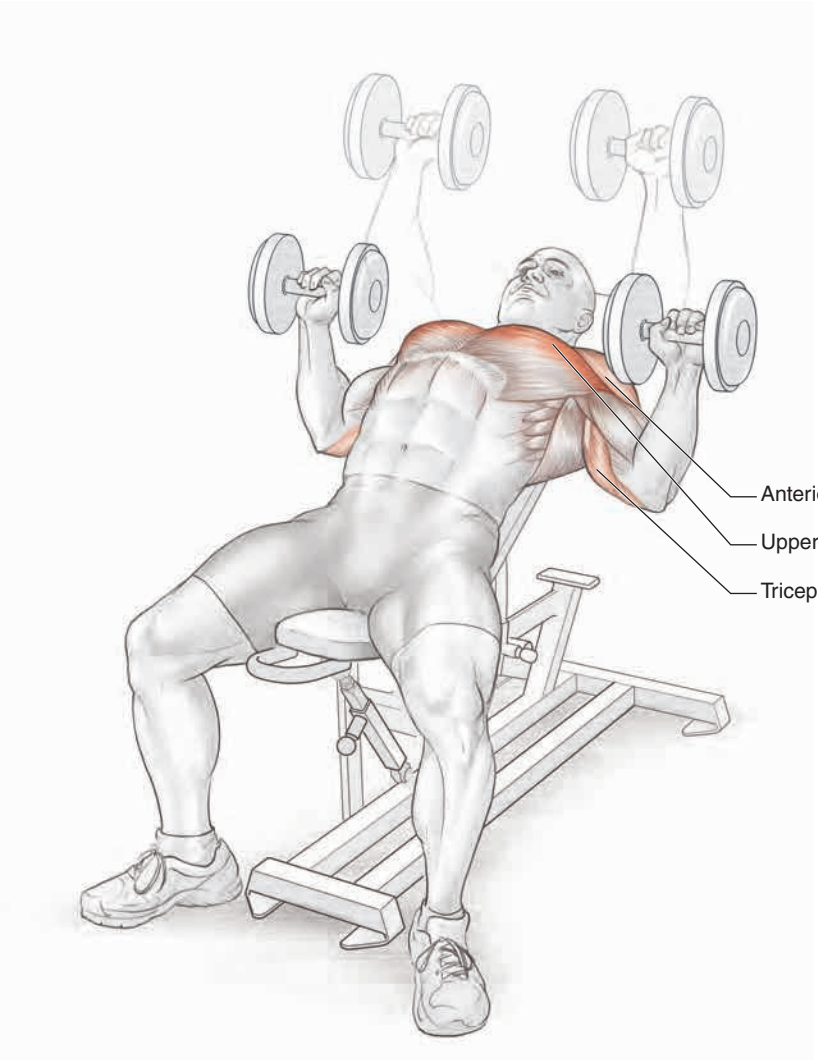
Range of motion: To maximize pectoral work, flare your elbows out wide as the barbell is lowered. A shorter repetition terminating the press just before lockout keeps tension on the pectorals and reduces triceps assistance.

VARIATION

Machine Incline Press

This variation provides better stability and safety than the standard barbell press does. Many machines offer a choice of grips. A neutral grip (thumbs up, palms facing each other) emphasizes the pectorals better than a pronated grip (palms forward).

DUMBBELL INCLINE PRESS



Execution

1. Sit on an incline bench. Hold a dumbbell in each hand at chest level, palms facing forward.
2. Press the dumbbells vertically upward until your elbows lock out.
3. Lower the dumbbells to your upper chest.

Muscles Involved

Primary: Upper pectoralis major

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Trajectory: The angle of incline determines trajectory. As the backrest is raised and the incline increases, the focus shifts progressively higher up the pectoral muscle. The upper pectoral is best targeted when the backrest is inclined 30 to 45 degrees to the floor. Steeper inclines of 60 degrees or more switch the focus to the anterior deltoid.

Grip: Dumbbell orientation affects hand position. Grasping the dumbbells with a pronated grip (palms facing forward) affords a greater stretch as the weights are lowered to the starting position. A neutral grip (palms facing each other) generates a better contraction at the lockout position.

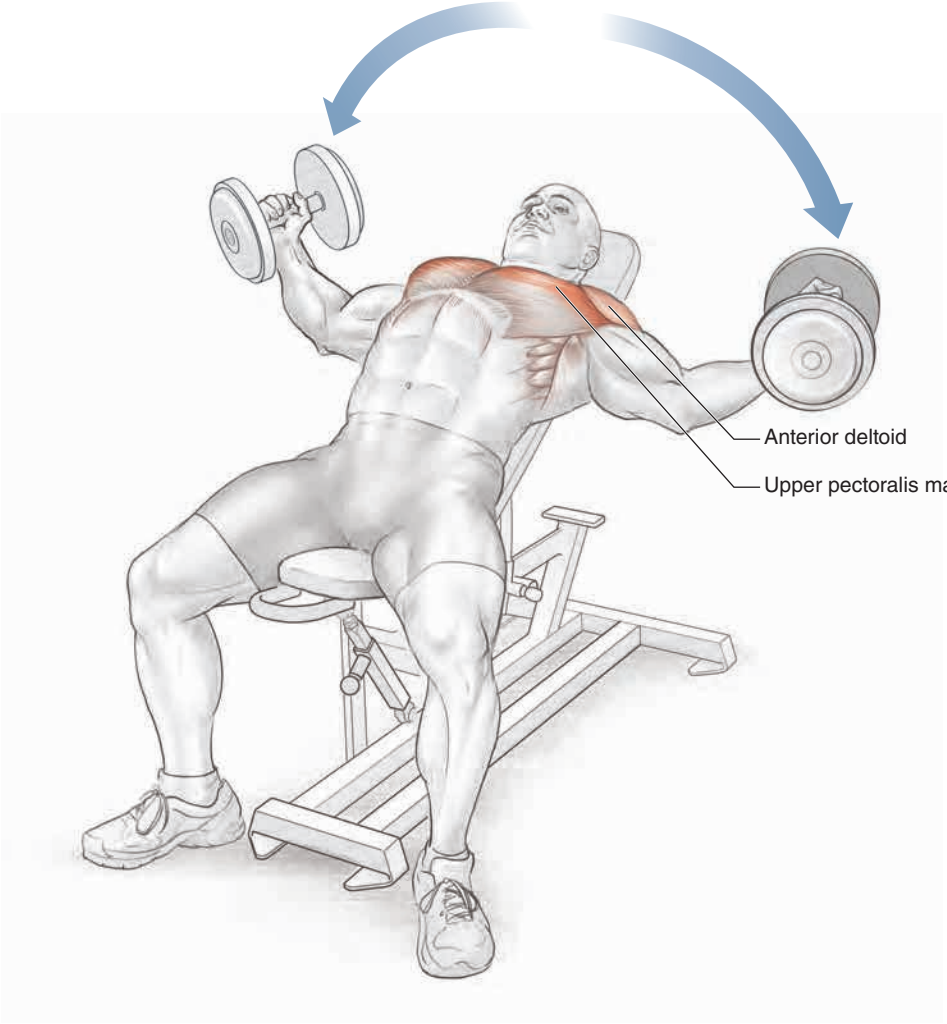
Range of motion: To maximize pectoral work, flare your elbows out wide as the dumbbells are lowered and touch the dumbbells together at the top of the movement. A shorter repetition terminating the press just before lockout keeps tension on the pectorals. The lower the dumbbells descend, the more the chest muscle stretches. However, lowering the dumbbells too far can cause shoulder injury. It's safer to terminate the descent when the dumbbells reach chest level.

VARIATION

Variable-Grip Dumbbell Press

Begin the exercise by holding a dumbbell in each hand with a pronated grip (palms forward). Rotate the dumbbells during the press so that your palms face together (neutral grip) at lockout.

DUMBBELL INCLINE FLY



Execution

1. Sit on an incline bench. Hold a dumbbell in each hand directly above your chest, palms facing each other, arms out straight.
2. Lower the dumbbells outward, bending your elbows slightly as the weight descends to chest level.
3. Raise the dumbbells back up and together.

Muscles Involved

Primary: Upper pectoralis major

Secondary: Anterior deltoid

Anatomic Focus

Trajectory: The angle of incline determines trajectory. As the backrest is raised and the incline increases, the focus shifts progressively higher up the pectoral muscle. The upper pectoral is best targeted when the backrest is inclined 30 to 45 degrees to the floor.

Grip: Dumbbell orientation affects hand position. The fly exercise works best when the dumbbells are held with a neutral grip (palms facing each other), but a pronated grip (palms facing forward) can be used as a variation.

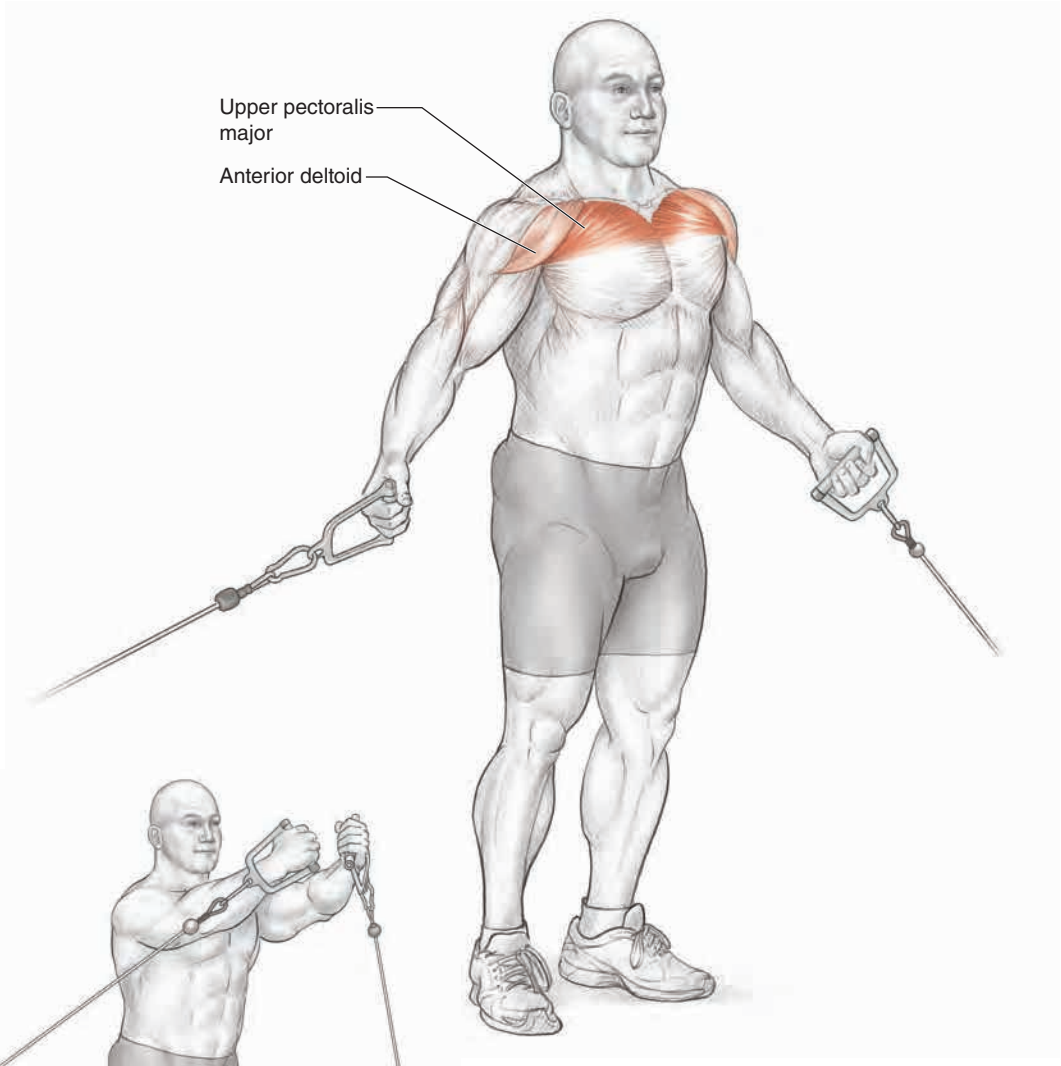
Range of motion: The lower the dumbbells descend, the greater the pectoral stretch. However, too much stretch can cause injury to the muscle and the shoulder joint. It's safer to terminate the descent when the dumbbells reach chest level.

VARIATION

Machine Fly

Performing the machine fly (described later in this chapter) with the seat low and the handles at eye level will target the upper pectorals.

CABLE LOW-PULLEY FLY



End position.

Execution

1. With each hand, grasp a D-handle attached to the low pulleys on a cable machine. Stand upright midway between the weight stacks, facing forward.
2. Raise your arms in a forward arc until the handles meet at head height.
3. Keeping your elbows stiff, lower the handles back to the starting position.

Muscles Involved

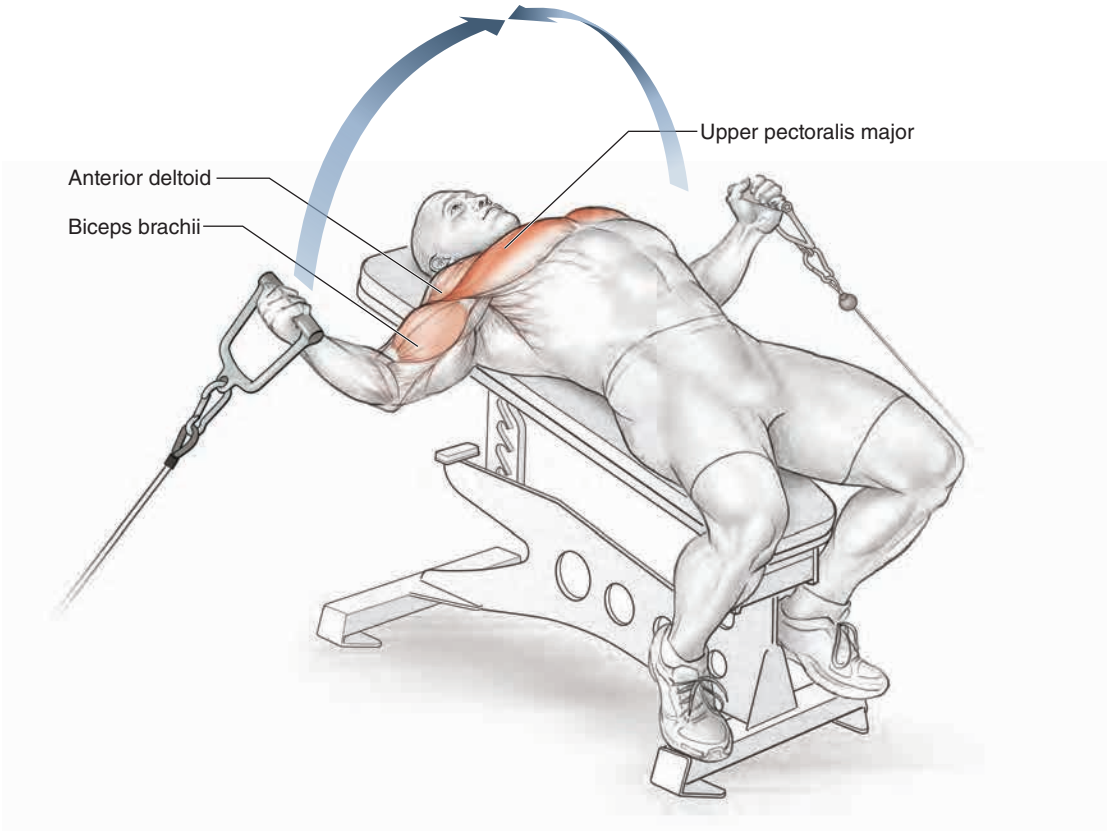
Primary: Upper pectoralis major

Secondary: Anterior deltoid

Anatomic Focus

Trajectory: Standing forward so that the pulleys are slightly behind you affords a better trajectory to target the pectoral muscles.

CABLE INCLINE FLY



Execution

1. Lying on an incline bench positioned centrally between the pulleys, grasp the D-handles attached to the low pulleys of a cable machine. Handles should be level with your chest.
2. Raise your arms in an upward arc until the handles meet above your head.
3. Keeping your elbows slightly bent, lower the handles back to the starting position level with your chest.

Muscles Involved

Primary: Upper pectoralis major

Secondary: Anterior deltoid, biceps brachii

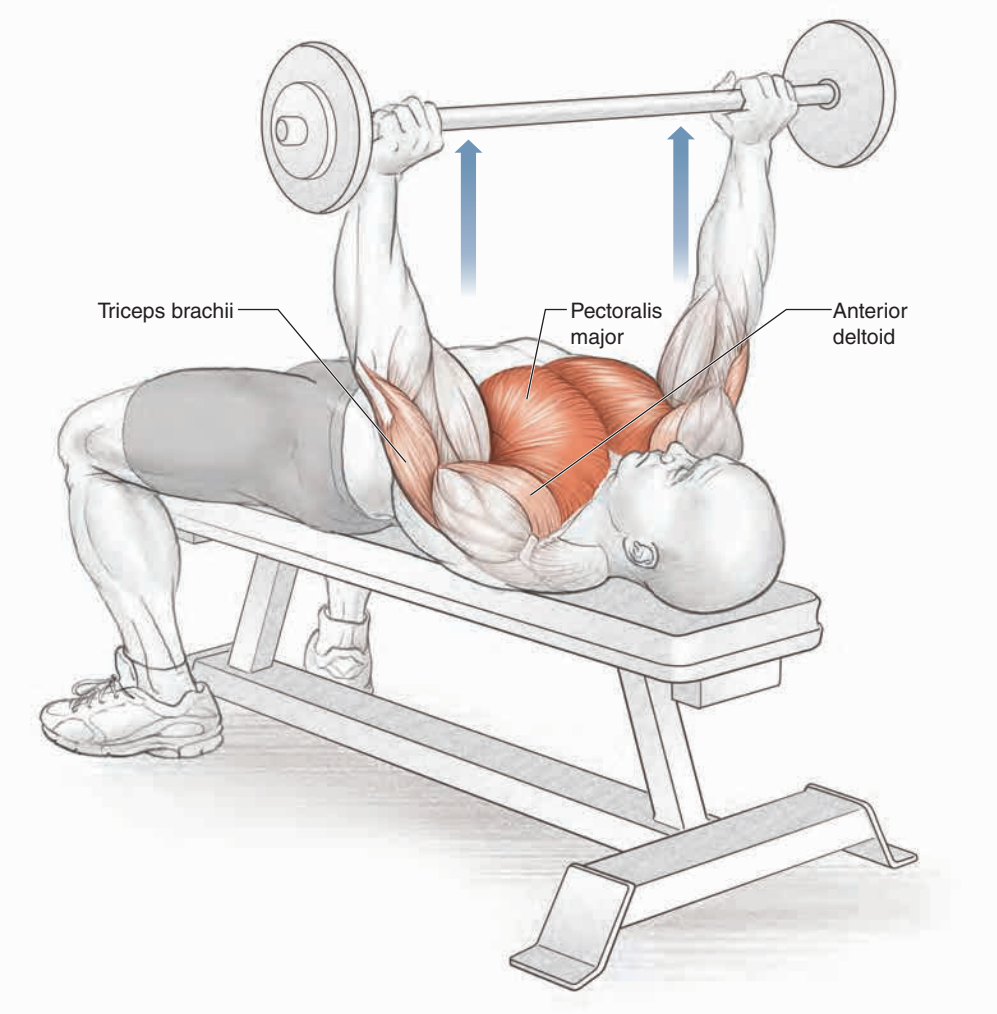
Anatomic Focus

Trajectory: The angle of incline determines trajectory. As the backrest is raised and the incline increases, the focus shifts progressively higher up the pectoral muscle. The upper pectoral is best targeted when the backrest is inclined 30 to 45 degrees to the floor.

Grip: Bend your elbows slightly during the descent to alleviate strain across the biceps.

Range of motion: The lower the handles descend, the greater the pectoral stretch. However, too much stretch can cause injury to the muscle and the shoulder joint. It's safer to terminate the descent when the handles reach chest level.

BARBELL BENCH PRESS



Execution

1. Lying on a flat bench, take a shoulder-width overhand grip on the bar.
2. Lower the weight slowly until the bar touches the middle chest.
3. Push the bar straight up until your elbows lock out.

Muscles Involved

Primary: Pectoralis major

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Body position: Your torso should lie flat, and your shoulders and buttocks should contact the bench. Plant your feet firmly on the floor for stability. If your lower back is arched or your buttocks rise off the bench, the focus shifts to the lower pectorals. Raising your feet off the floor by bending your knees may help target the middle chest, but stability and balance are compromised when your feet are not in contact with the floor.

Hand spacing: The ideal hand spacing is shoulder width or slightly wider. A narrow (close) grip emphasizes the inner pectorals and targets the triceps. A wider grip targets the outer section of the muscle and minimizes triceps contribution.

Trajectory: The bar should move vertically up and down from the middle chest (nipple area). Flare your elbows out as the bar is lowered to maximize pectoral isolation.

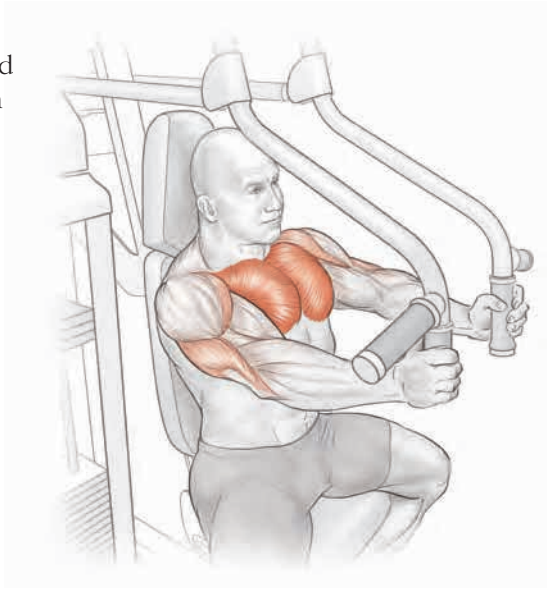
Range of motion: A shorter repetition terminating the press just before lockout keeps tension on the pectorals and reduces the amount of triceps assistance.

Grip: An underhand (supinated) grip on the bar switches the focus to the triceps.

VARIATIONS

Machine Chest Press

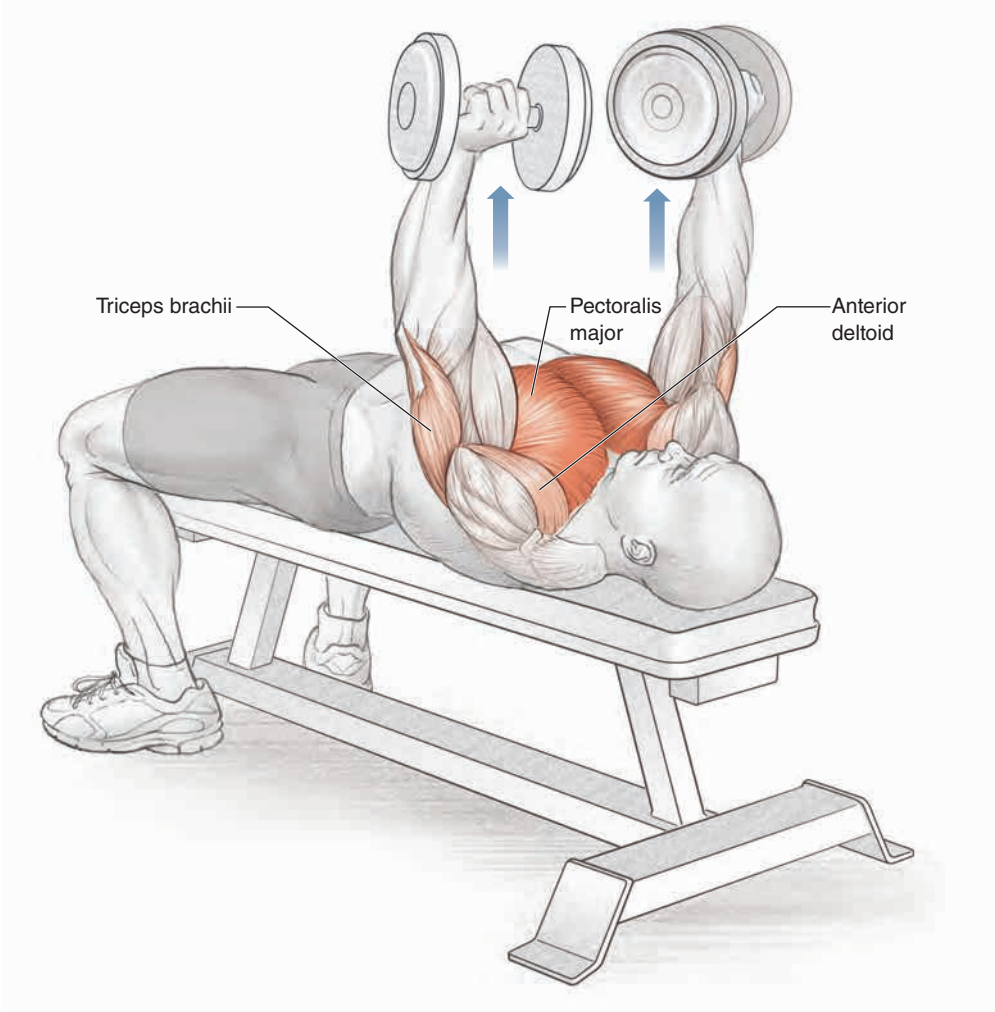
Machines provide better stability and safety than the standard barbell bench press does. Many machines offer a choice of grips. A neutral grip (thumbs up, palms facing each other) isolates the pectorals better than a pronated grip (palms forward).



Close-Grip Bench Press

Perform the exercise with hands spaced approximately 6 inches (15 cm) apart. The narrow grip targets the inner pectorals and works the triceps.

DUMBBELL BENCH PRESS



Execution

1. Lying on a flat bench, hold a dumbbell in each hand at chest level, palms facing forward.
2. Press the dumbbells vertically upward until the elbows lock out.
3. Lower the dumbbells to the middle chest.

Muscles Involved

Primary: Pectoralis major

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Grip: Dumbbell orientation affects hand position. Holding the dumbbells with palms facing forward (pronated grip) provides more stretch as the weight is lowered to the starting position. Holding the dumbbells with palms facing each other (neutral grip) allows a better contraction in the lockout position.

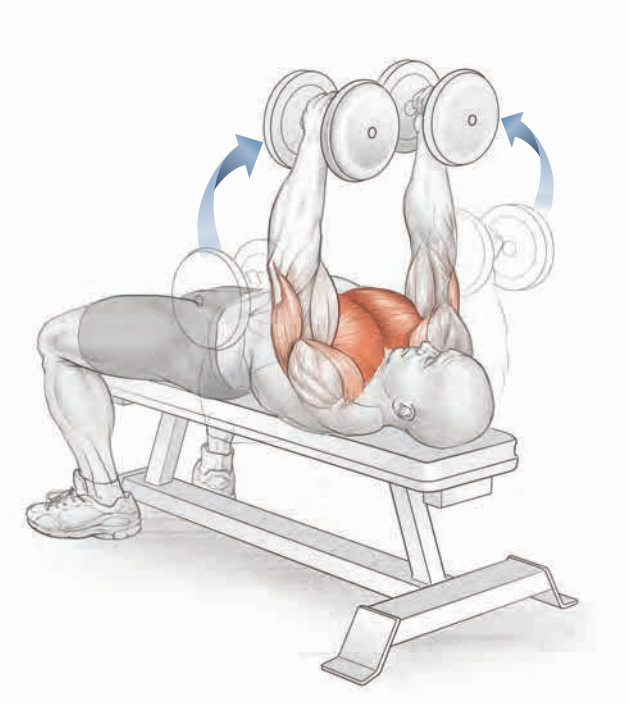
Trajectory: Your torso should lie flat on the bench, and the dumbbells should move vertically up and down from the middle chest (nipple area). To maximize pectoral isolation, flare your elbows out wide during the descent and touch the dumbbells together at lockout.

Range of motion: A shorter repetition terminating the press just before lockout keeps tension on the pectorals and reduces triceps assistance. The lower the dumbbells descend, the more the chest muscle stretches. However, lowering the dumbbells too far can cause shoulder injury. It's safer to terminate the descent when the dumbbells reach chest level.

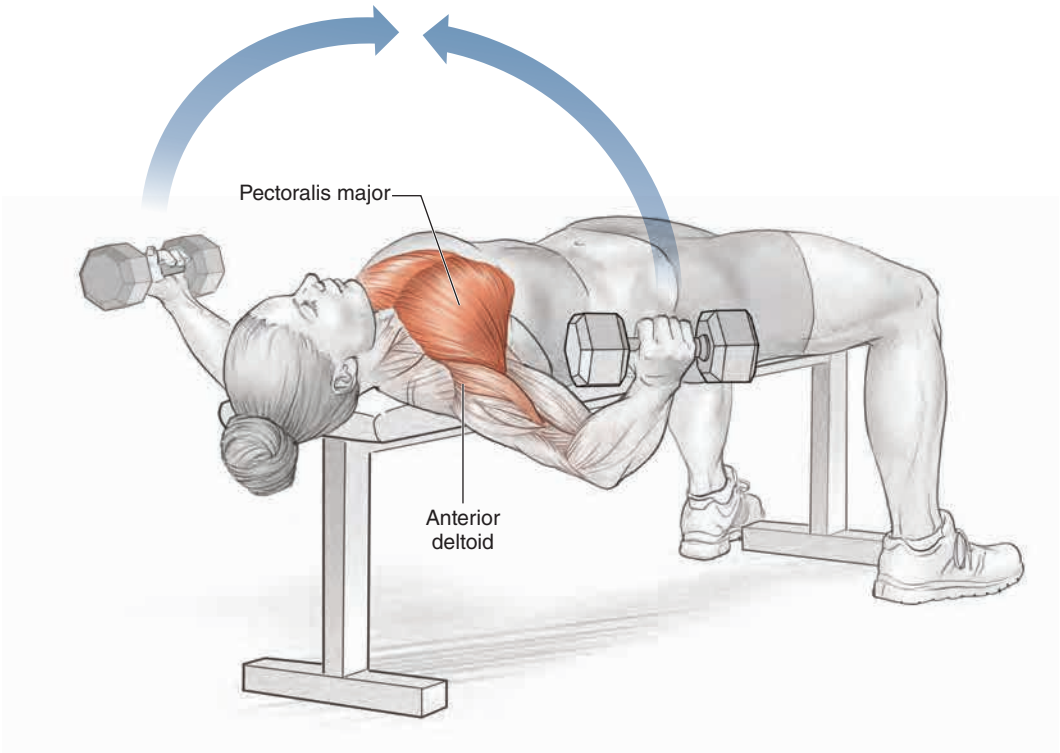
VARIATION

Variable-Grip Dumbbell Bench Press

Hold a dumbbell in each hand with a pronated grip (palms forward) at the start. Rotate the dumbbells as you press so that your palms face each other (neutral grip) at lockout.



DUMBBELL FLY



Execution

1. Lie on a flat bench, holding a dumbbell in each hand. Begin with the dumbbells directly above the middle chest, palms facing each other, arms out straight.
2. Lower the dumbbells out wide, bending the elbows slightly as the weight descends to chest level.
3. Raise the dumbbells in an upward arc back to the vertical position.

Muscles Involved

Primary: Pectoralis major

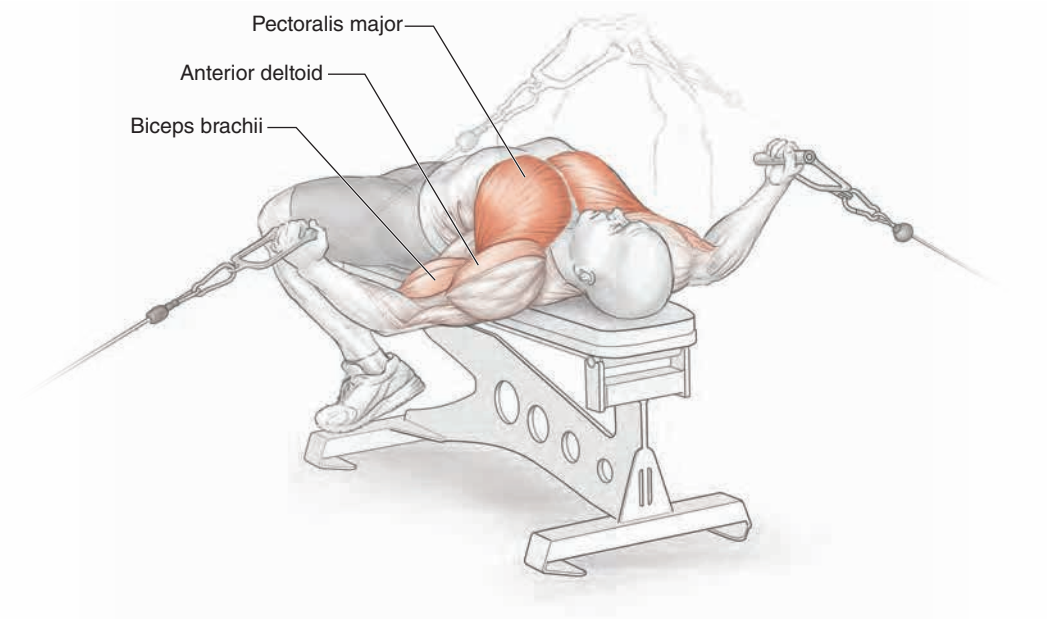
Secondary: Anterior deltoid

Anatomic Focus

Grip: Dumbbell orientation affects hand position. The fly exercise works best when the dumbbells are held with a neutral grip (palms facing each other), but a pronated grip (palms facing forward) can also be used for variation.

Range of motion: The lower the dumbbells descend, the greater the pectoral stretch, but also the greater the chance of injury. It's safer to terminate the descent when the dumbbells reach chest level.

CABLE FLAT-BENCH FLY



Execution

1. Lying on a flat bench positioned centrally between the pulleys, grasp the D-handles attached to the low pulleys of a cable machine. Handles should be level with your chest.
2. Raise your arms in an upward arc until the handles meet above your chest.
3. Keeping your elbows slightly bent, lower the handles to the starting position level with your chest.

Muscles Involved

Primary: Pectoralis major

Secondary: Anterior deltoid, biceps brachii

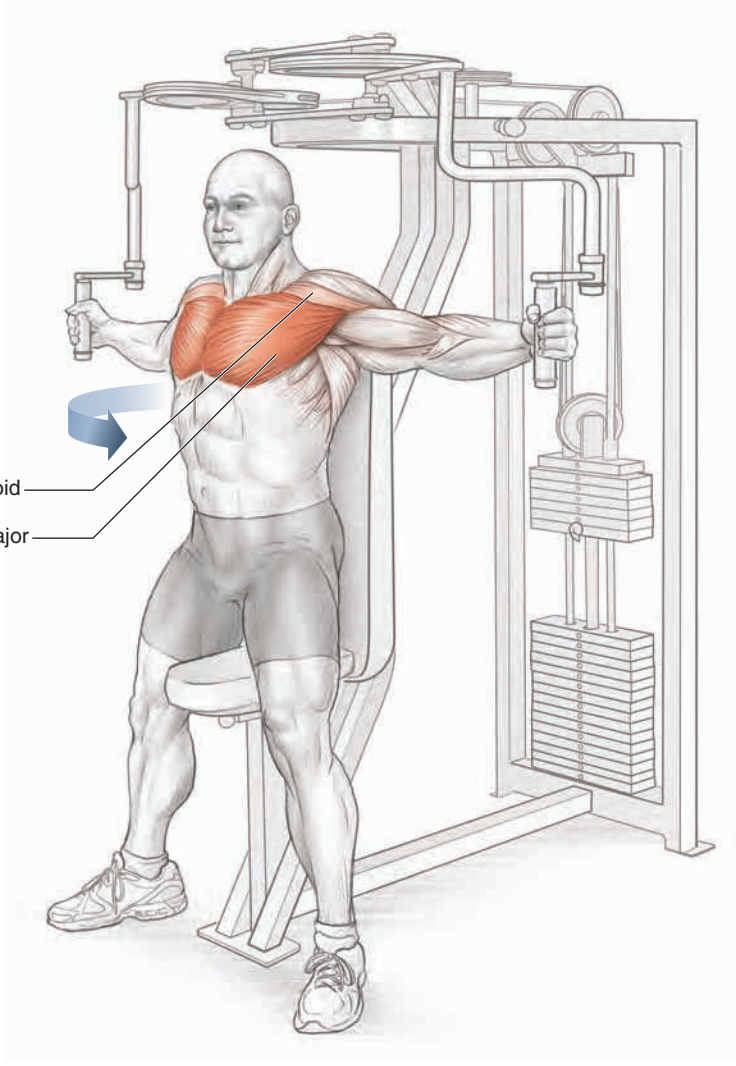
Anatomic Focus

Trajectory: The mid pectoral muscle is best targeted with a flat bench. Changing the angle to an incline will shift the focus toward the upper chest, whereas changing the angle to a decline will target the lower chest.

Grip: Bend your elbows slightly during the descent to alleviate strain across the biceps.

Range of motion: The lower the handles descend, the greater the pectoral stretch. However, too much stretch can cause injury to the muscle and the shoulder joint. It's safer to terminate the descent when the handles reach chest level.

MACHINE FLY



Execution

1. Grab the vertical handles, elbows slightly bent.
2. Squeeze the handles together until they touch in front of your chest.
3. Let your arms move back to the starting position, keeping your elbows up.

Muscles Involved

Primary: Pectoralis major

Secondary: Anterior deltoid

Anatomic Focus

Grip: The fly exercise works best with a neutral grip (palms facing each other), but a pronated grip (palms facing forward) can also be used for variation. Keep your elbows stiff and slightly bent throughout the movement.

Range of motion: The inner central portion of the pectoral muscle does most of the work as the handles are squeezed together. To emphasize the inner pectorals, use a narrow range of motion, focusing on the squeeze position. Perform partial repetitions in which your hands move through a short, 45-degree arc from the 12 o'clock (handles touching) position outward to 10 o'clock on the left and 2 o'clock on the right. Keep your elbows straight to achieve maximum squeeze. The emphasis switches to the outer pectorals when your hands move out wide. Do not allow the handles to pass behind the plane of your body or you will enter the injury zone. It's safer to terminate the stretch phase when your arms are in line with your chest.

Trajectory: Position the seat so the handles are level with your chest. To maximize pectoral isolation, keep your elbows high (shoulder level) during the movement.

Body position: When the seat is low and the handles are held high, the upper chest is emphasized. When the seat is high and the handles are held low, the lower chest is emphasized. In order to target the middle chest, position the seat so the machine's handles are level with your chest.

Resistance: Unlike dumbbell flys, in which the resistance varies during the lift, the machine fly affords a uniform resistance throughout the motion and is excellent for targeting the inner pectorals.

VARIATIONS

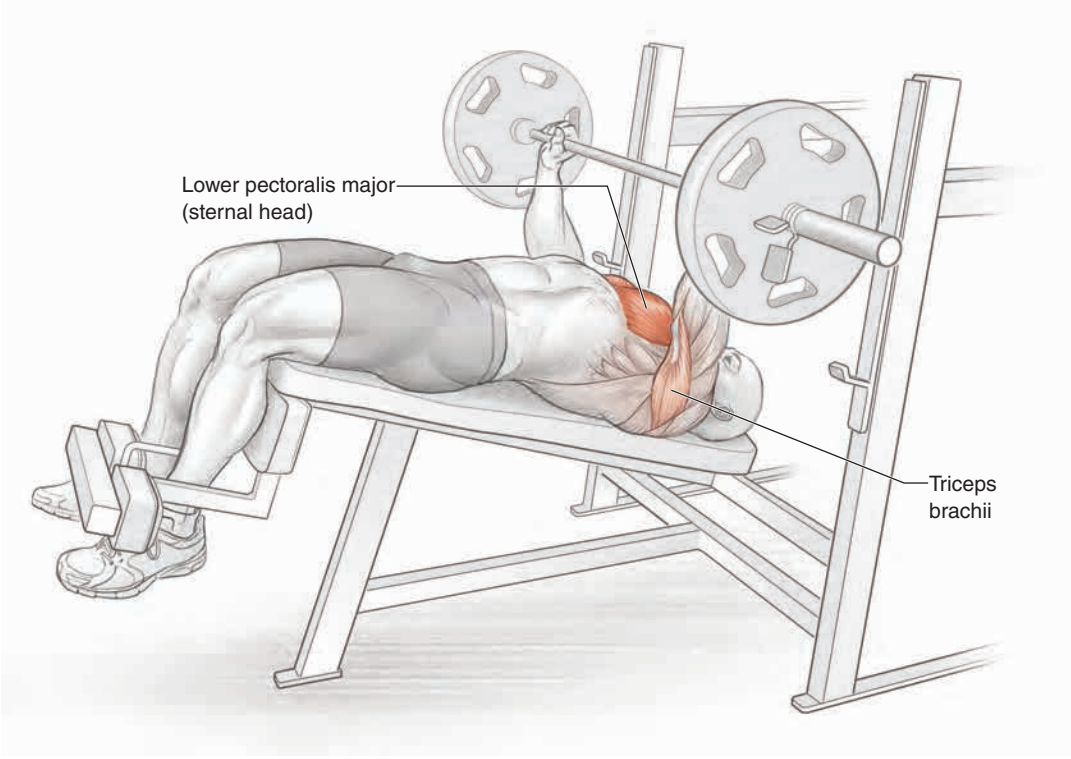
Pec Deck Fly

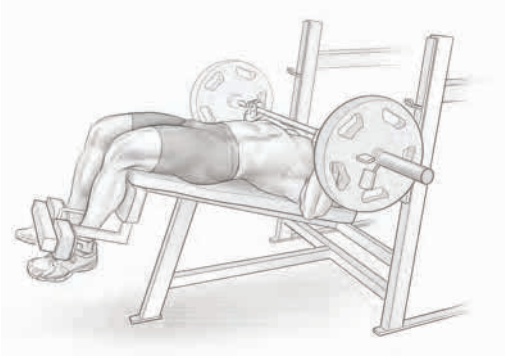
The pec deck fly is a similar exercise that uses elbow pads instead of handles.

One-Arm Machine Fly

Do this exercise using one arm at a time.

BARBELL DECLINE PRESS





Down position.

Execution

1. Lying on a decline bench, take a shoulder-width overhand grip on the bar.
2. Lower the weight slowly until the bar touches your lower chest.
3. Push the bar straight up until your elbows lock out.

Muscles Involved

Primary: Lower pectoralis major (sternal head)

Secondary: Triceps brachii, anterior deltoid

Anatomic Focus

Trajectory: The decline angle determines trajectory. As the bench is tilted head-down and the decline gets steeper, the focus shifts progressively lower down the pectoral muscle. The lower pectoral is best targeted at a decline of 20 to 40 degrees to the floor. Steeper declines shift the focus from the chest to the triceps. Flare your elbows out as the bar is lowered to maximize pectoral isolation.

Hand spacing: The ideal hand spacing is shoulder width. Wider grips target the outer section of the muscle, afford a greater stretch, and minimize triceps contribution. A narrow (close) grip targets the inner pectorals and requires more work from the triceps.

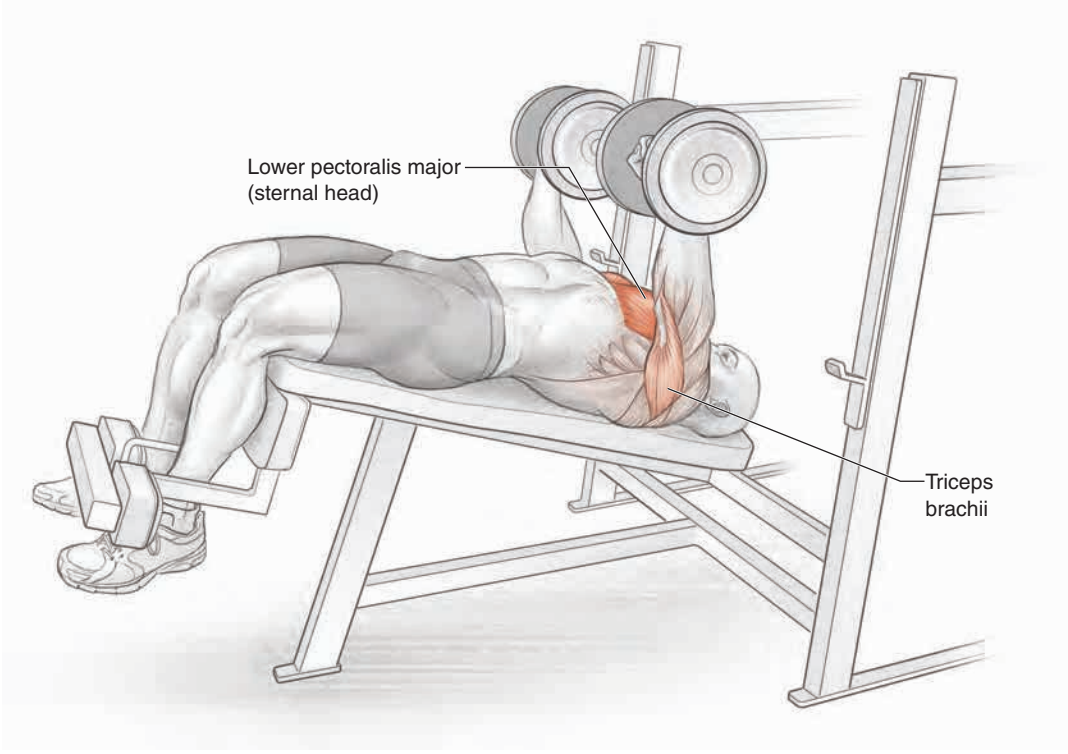
Range of motion: A shorter repetition terminating the press just before lockout keeps tension on the pectorals and reduces the amount of triceps assistance.

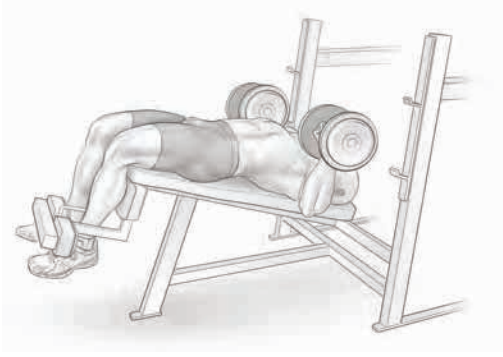
VARIATION

Machine Decline Press

Performing the decline press on a machine, such as the Smith machine, affords better stability and safety.

DUMBBELL DECLINE PRESS





Down position.

Execution

1. Lying on a decline bench, hold a dumbbell in each hand at chest level, palms facing forward.
2. Press the dumbbells vertically upward until your elbows lock out.
3. Lower the dumbbells to the middle chest.

Muscles Involved

Primary: Lower pectoralis major (sternal head)

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Grip: Dumbbell orientation affects hand position. Holding the dumbbells with palms facing forward (pronated grip) provides more stretch as the weight is lowered to the starting position. Holding the dumbbells with palms facing each other (neutral grip) allows a better contraction in the lockout position.

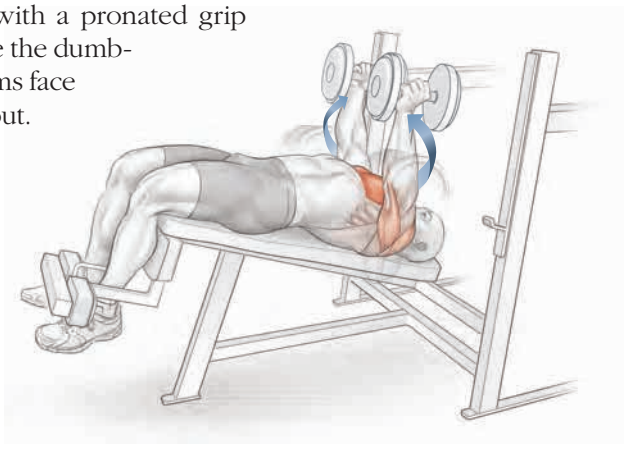
Trajectory: The decline angle determines trajectory. As the bench is tilted head-down and the decline gets steeper, the focus shifts progressively lower down the pectoral muscle. The lower pectoral is best targeted at a decline of 20 to 40 degrees to the floor. Dumbbells should move vertically up and down from the middle chest (nipple area). To maximize pectoral isolation, flare your elbows out wide during the descent and touch the dumbbells together at lockout.

Range of motion: A shorter repetition terminating the press just before lockout keeps tension on the pectorals and reduces triceps assistance. The lower the dumbbells descend, the more the chest muscle stretches. However, lowering the dumbbells too far can cause shoulder injury. It's safer to terminate the descent when the dumbbells reach chest level.

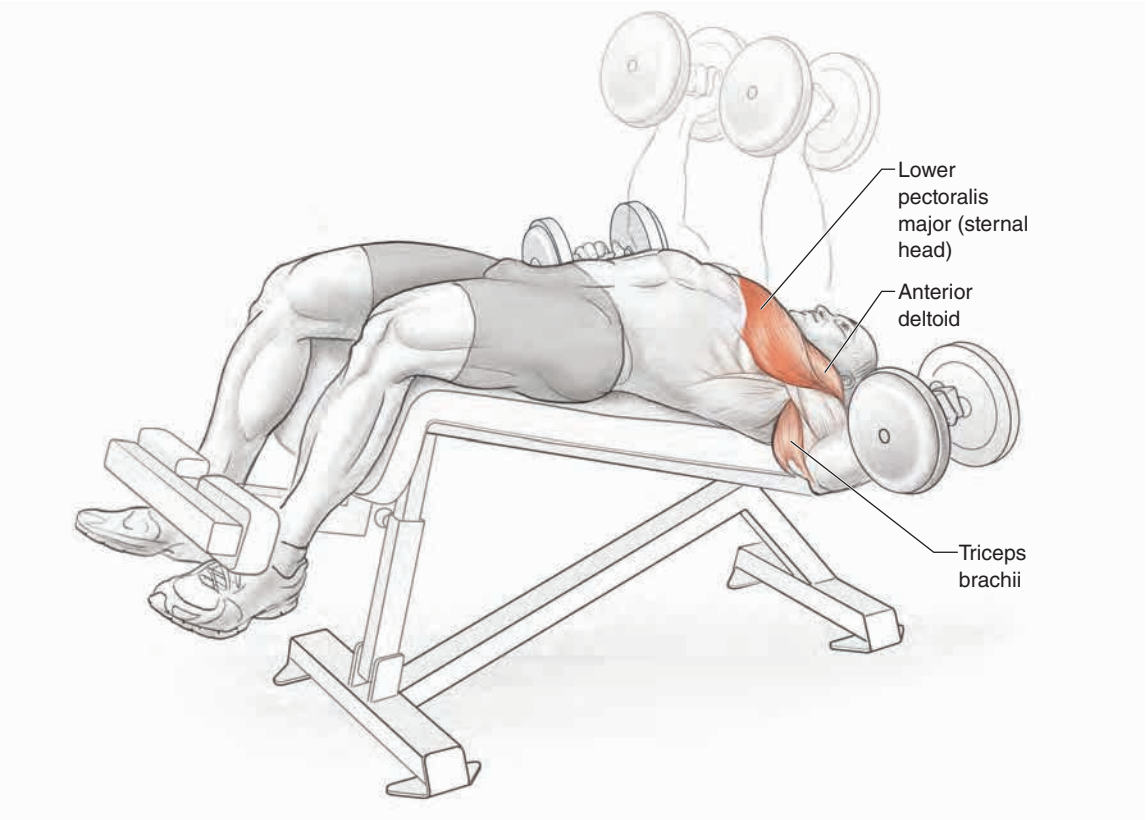
VARIATION

Variable-Grip Dumbbell Decline Press

Hold a dumbbell in each hand with a pronated grip (palms forward) at the start. Rotate the dumbbells as you press so that your palms face each other (neutral grip) at lockout.



DUMBBELL DECLINE FLY



Execution

1. Lying on a decline bench, hold a dumbbell in each hand directly above your chest, palms facing each other.
2. Lower the dumbbells outward, bending your elbows slightly as the weight descends to chest level.
3. Raise the dumbbells back up and together.

Muscles Involved

Primary: Lower pectoralis major (sternal head)

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Trajectory: The decline angle determines trajectory. As the bench is tilted head-down and the decline gets steeper, the focus shifts progressively lower down the pectoral muscle. The lower pectoral is best targeted at a decline of 20 to 40 degrees to the floor.

Grip: Dumbbell orientation affects hand position. The fly exercise works best when the dumbbells are held with a neutral grip (palms facing each other), but a pronated grip (palms facing forward) can also be used as a variation.

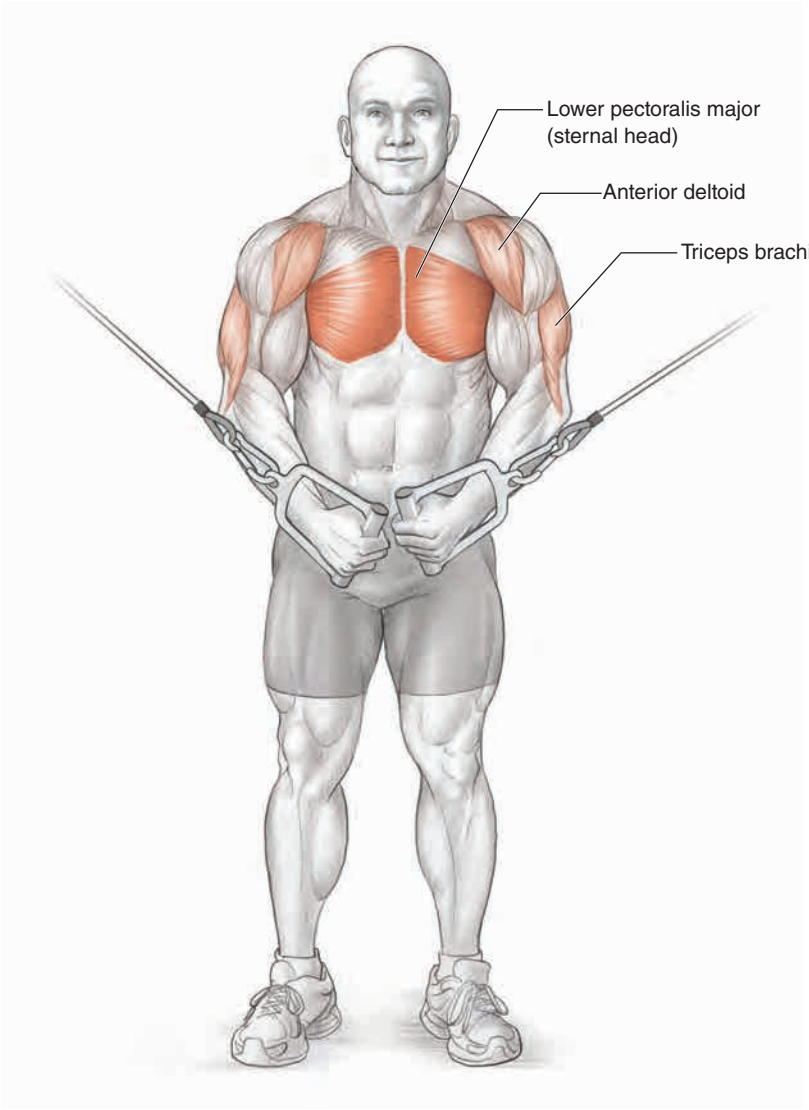
Range of motion: The lower the dumbbells descend, the greater the pectoral stretch, but also the greater the chance of injury. It's safer to terminate the descent when the dumbbells reach chest level.

VARIATION

Variable-Grip Dumbbell Fly

Hold the dumbbells with a pronated grip (palms forward) at the bottom of the movement and then rotate the dumbbells during the lift so that your palms face each other (neutral grip) at the top of the movement.

CABLE CROSSOVER



Execution

1. Standing upright, grasp the D-handles attached to the high pulleys of a cable machine.
2. Squeeze the handles down and together until your hands touch in front of your waist. Keep your elbows slightly bent.
3. Slowly return to the starting position.

Muscles Involved

Primary: Lower pectoralis major (sternal head)

Secondary: Anterior deltoid, triceps brachii

Anatomic Focus

Trajectory: Your torso should be upright or tilted forward slightly at the waist. The level at which your hands meet determines the focus on the muscle. A low trajectory, in which the handles meet in front of your hips or waist, targets the lowest fibers of the pectoral muscle. A high trajectory, in which the handles meet at chest level, targets the midsection of the pectorals.

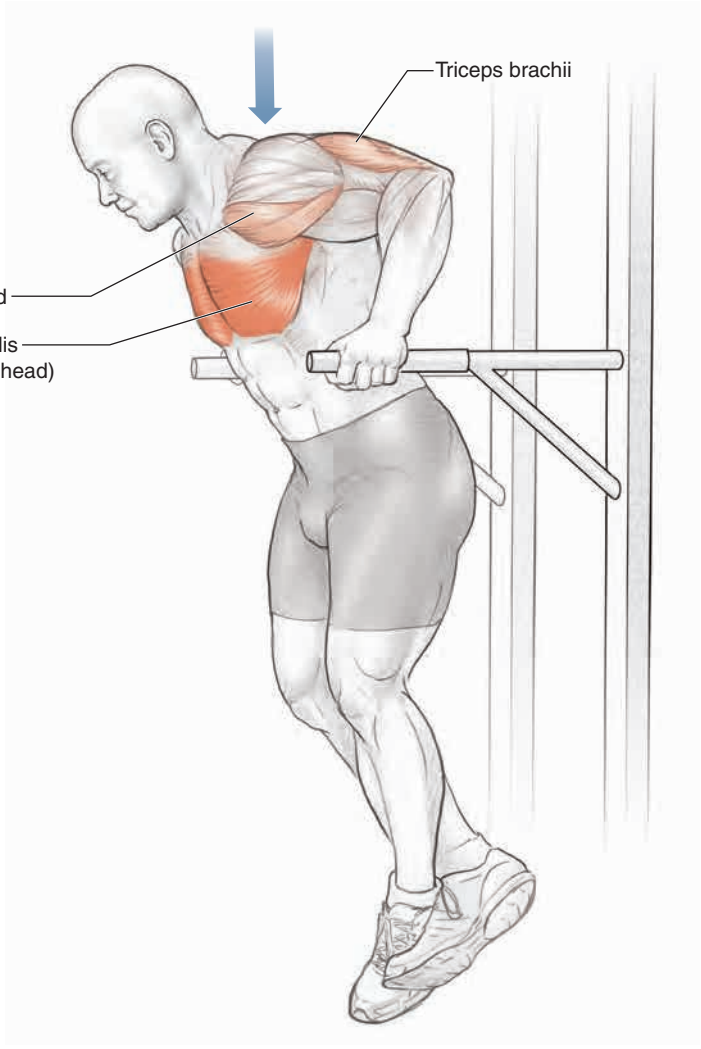
Range of motion: Crossing your hands at the bottom of the movement increases the range of motion and targets the inner central portion of the pectorals. Extending the starting position by allowing your hands to pass above shoulder or head height affords a greater stretch but also places unnecessary stress on the shoulder joint.

VARIATION

Seated Crossover

Newer machines allow you to perform this exercise while seated with a back support.

CHEST DIP



Execution

1. Grab the parallel bars and support your body with your elbows locked straight.
2. Bend your elbows, lowering your torso until your upper arms are parallel to the floor.
3. Push yourself back up until your elbows lock out.

Muscles Involved

Primary: Lower pectoralis major (sternal head)

Secondary: Triceps brachii, anterior deltoid

Anatomic Focus

Trajectory: The position of your torso affects the focus of the exercise. A slight forward tilt is better for targeting the pectorals, and the more you bend forward the harder you work the pectorals. An upright posture shifts the focus to the triceps, and the more you straighten your torso the more you involve the triceps. Flare your elbows out as you descend to maximize pectoral isolation.

Grip: A standard grip on the parallel bars with thumbs pointing forward works best when targeting the chest. A reverse grip with thumbs pointing backward shifts the focus to the triceps.

VARIATION

Machine Dip

You can perform this exercise while seated on a machine. However, because most dip machines restrict torso motion, they tend to target the triceps more than the chest.

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chapter 3

BACK

Anatomically, the rear torso (back; figure 3.1) consists of several layers of muscle, stacked like a sandwich. Functionally, and for bodybuilding purposes, the back is best considered in three sections that resemble triangular segments of a quilted blanket.

The upper back is made up of a large triangular muscle called the trapezius. It originates along the upper spine from the skull down to the last rib—that is, all the cervical and thoracic vertebrae. The upper fibers of the trapezius in the neck attach to the outer tip of the shoulder on the clavicle, acromion, and scapula (shoulder blade). The middle and lower fibers of the trapezius in the upper back attach to the scapula. The upper trapezius elevates the scapula to shrug the shoulders and rotates the scapula to assist shoulder abduction. The middle trapezius retracts the scapula, pulling the shoulders backward. The lower trapezius depresses the scapula downward.

Underneath the trapezius are three muscles that anchor the scapula to the spine: the levator scapulae, rhomboid major, and rhomboid minor. The levator scapulae assists the upper trapezius to elevate the scapula. The rhomboid major and rhomboid minor work with the middle trapezius to retract the scapula. These scapular retractors lie under the trapezius and add muscular thickness to the upper back.

The middle back consists of the latissimus dorsi, a large fan-shaped muscle that arises from the lower half of the spinal column and the rear ridge of the pelvic bone (posterior iliac crest). From its large origin, the latissimus dorsi converges into a band-like tendon that attaches to the upper humerus, next to the tendon of the pectoralis major. When the latissimus dorsi contracts, movement takes place at the shoulder joint. The latissimus dorsi pulls the upper arm downward and backward (shoulder extension); hence, this muscle is targeted by pull-downs, pull-ups, and rows. The latissimus dorsi also pulls the arm in against the side of the body (adduction).

The lower back is made up of the erector spinae (or sacrospinalis) muscles that run the entire length of the spinal column. In the lumbar region, the erector spinae splits into three columns: the iliocostalis, longissimus, and spinalis. These muscles are the pillars of strength in the lower back that stabilize the spine and extend the torso, arching the spine backward.

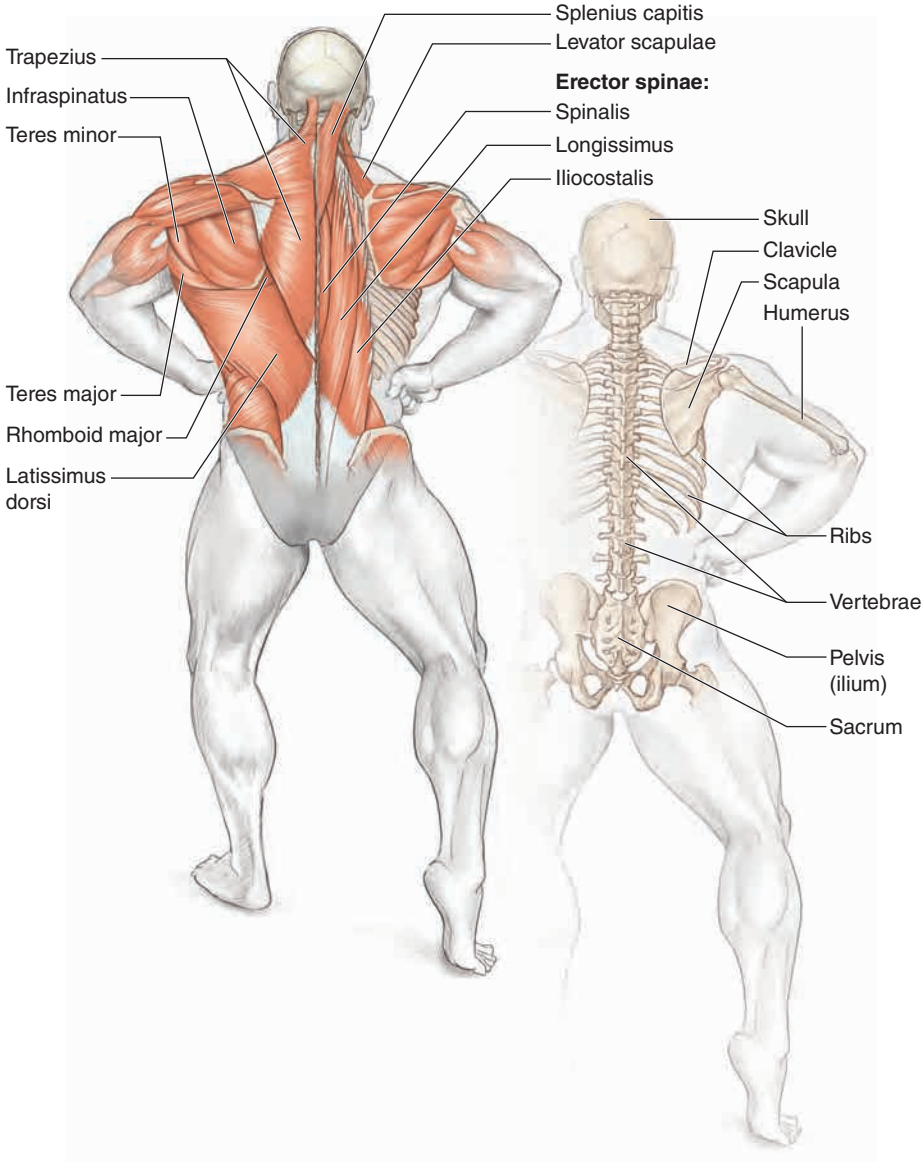
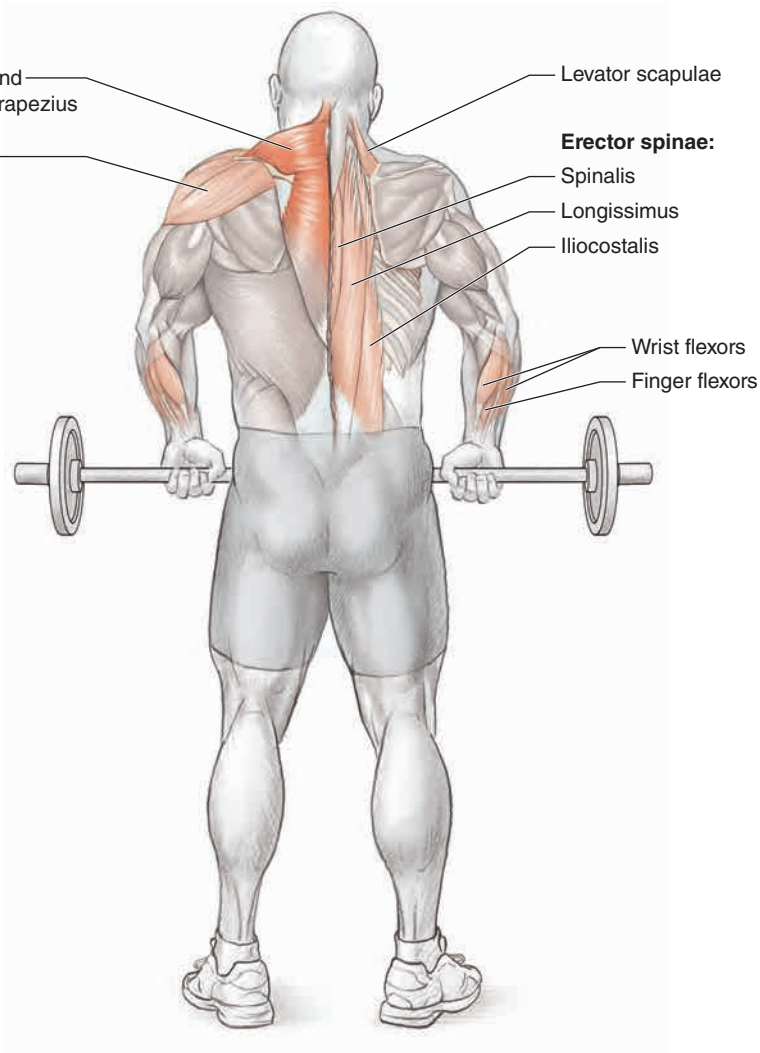


Figure 3.1 Showcasing the back.

The trapezius and latissimus dorsi are concerned primarily with movements of the shoulder and arm. It is the sacrospinalis muscles that cause movements of the spine and torso. Exercises that target the back muscles include shrugs, pull-downs, pull-ups, rows, and lumbar extensions. The deadlift is a compound, multijoint exercise that involves all of the back muscles.

BARBELL SHRUG



Execution

1. Hold a barbell at arms' length in front of your thighs using an overhand shoulder-width grip.
2. Keeping your arms stiff, shrug your shoulders as high as possible, pulling the bar vertically upward.
3. Lower the bar slowly down to the starting position, stretching the trapezius.

Muscles Involved

Primary: Upper and middle trapezius

Secondary: Levator scapulae, deltoid, erector spinae (iliocostalis, longissimus, spinalis), forearms (wrist flexors, finger flexors)

Anatomic Focus

Hand spacing: A shoulder-width or narrower grip on the bar emphasizes the trapezius. A wider grip works the deltoid as well.

Trajectory: Lift the bar straight up and down. Do not roll or rotate the shoulders.

Body position: Performing the shrug while standing vertically upright hits the trapezius centrally. Tilting the torso slightly back at the waist targets the upper trapezius in the neck, whereas leaning slightly forward targets the midsection of the muscle behind the shoulders.

Range of motion: The higher the bar is raised, the harder the trapezius works.

VARIATIONS

Rear Shrug

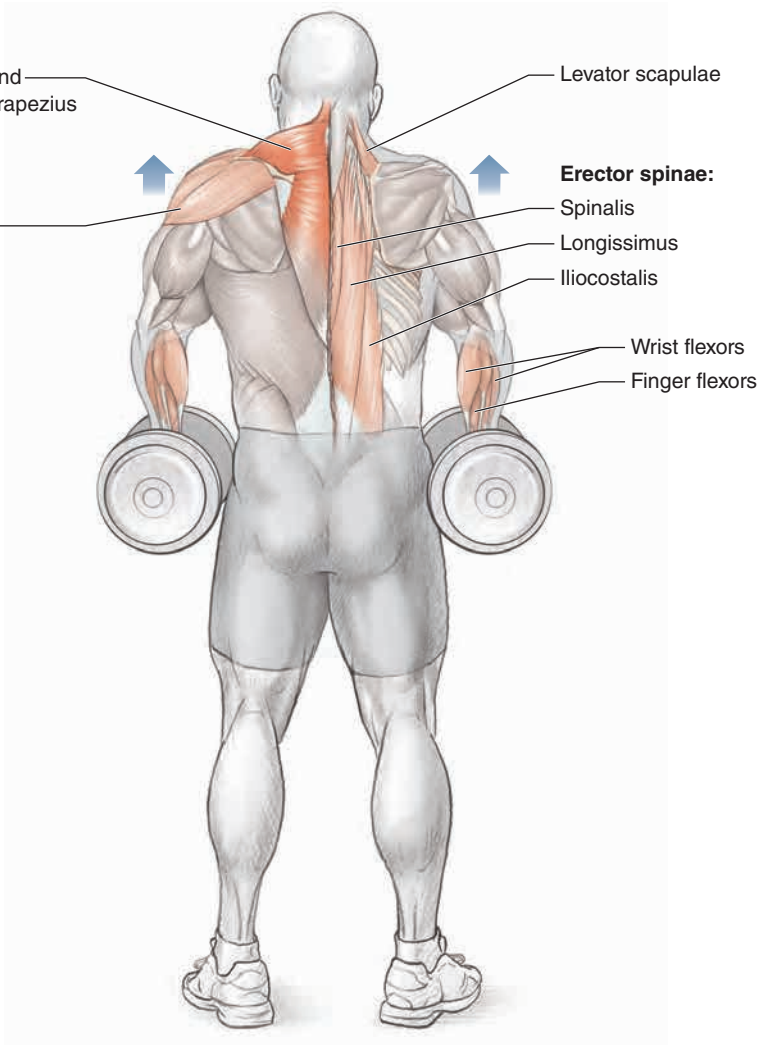
Performing the exercise with the barbell behind your hips causes scapular retraction, pulling the shoulders backward to emphasize the middle fibers of the trapezius.



Machine Shrug

Performing this exercise on a machine affords a choice of grips—pronated (thumbs pointing in) or neutral (thumbs pointing forward). A neutral grip emphasizes the upper trapezius in the neck, whereas a pronated grip targets the middle trapezius in the back.

DUMBBELL SHRUG



Execution

1. Stand upright with a dumbbell in each hand, hands hanging at your sides.
2. Keeping your arms straight, shrug your shoulders upward as high as possible.
3. Lower the dumbbells back down to the starting position.

Muscles Involved

Primary: Upper and middle trapezius

Secondary: Levator scapulae, deltoid, erector spinae (iliocostalis, longissimus, spinalis), forearms (wrist flexors, finger flexors)

Anatomic Focus

Grip: A neutral grip (thumbs pointing forward) emphasizes the upper trapezius in the neck, whereas a pronated grip (thumbs pointing in) targets the middle trapezius in the back.

Body position: Tilting your torso slightly back at the waist targets the upper trapezius, whereas leaning slightly forward targets the muscle lower down the neck. Performing the shrug while standing vertically upright hits the upper and middle sections of the trapezius.

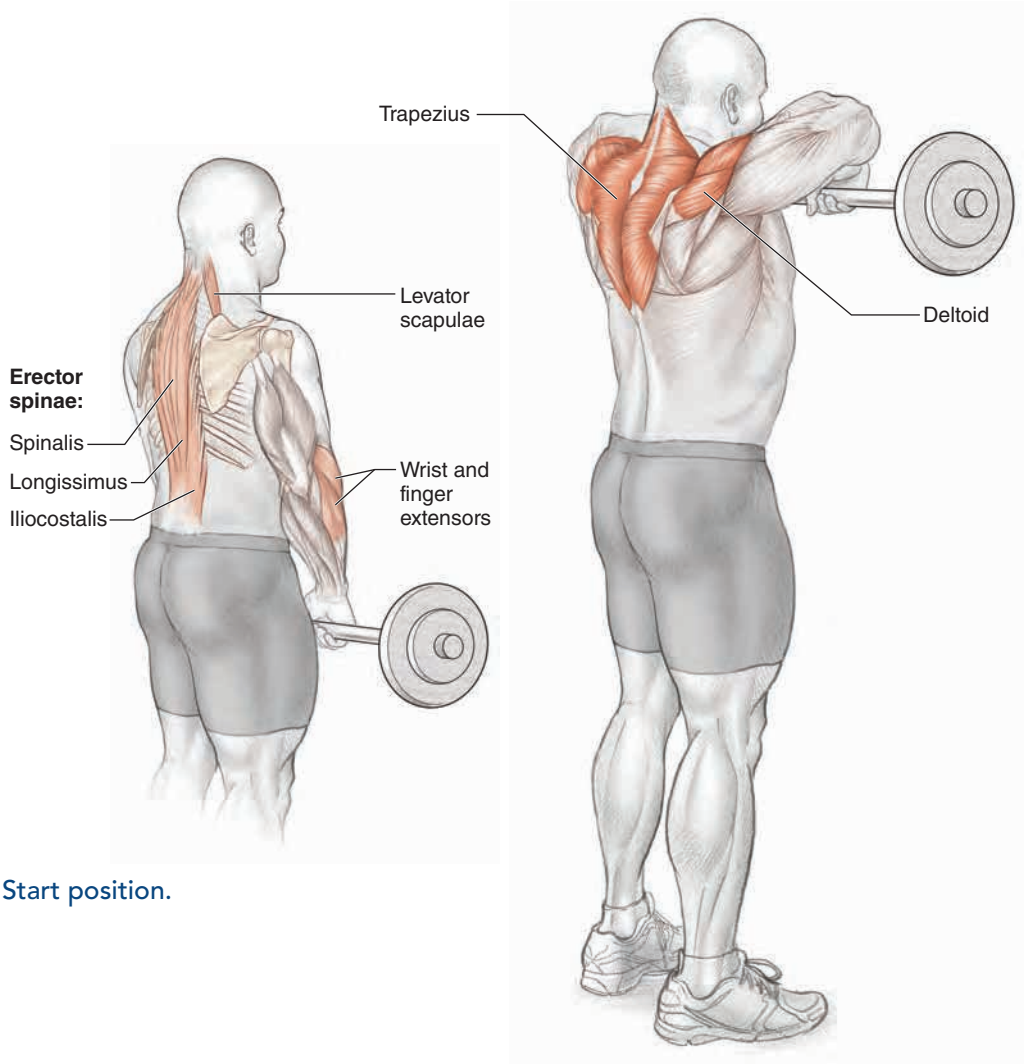
Range of motion: The higher the weight is raised, the harder the trapezius works. The farther the dumbbells are lowered, the greater the stretch at the bottom of the movement.

VARIATION

Retracting Shrug

Hold the dumbbells in front of your body using a pronated grip. Squeeze your shoulder blades together during the shrug, finishing with the dumbbells at your sides in a neutral grip. During the movement the dumbbells are lifted upward (scapular elevation), working the upper trapezius, and backward (scapular retraction), working the middle trapezius.

BARBELL UPRIGHT ROW



Start position.

Execution

1. Hold a barbell at arms' length in front of your thighs using an overhand shoulder-width grip.
2. Pull the bar vertically upward until it reaches your chin, raising your elbows as high as possible.
3. Lower the bar slowly back down to the starting position.

Muscles Involved

Primary: Trapezius, deltoid

Secondary: Levator scapulae, erector spinae (iliocostalis, longissimus, spinalis), forearms (wrist extensors, finger extensors)

Anatomic Focus

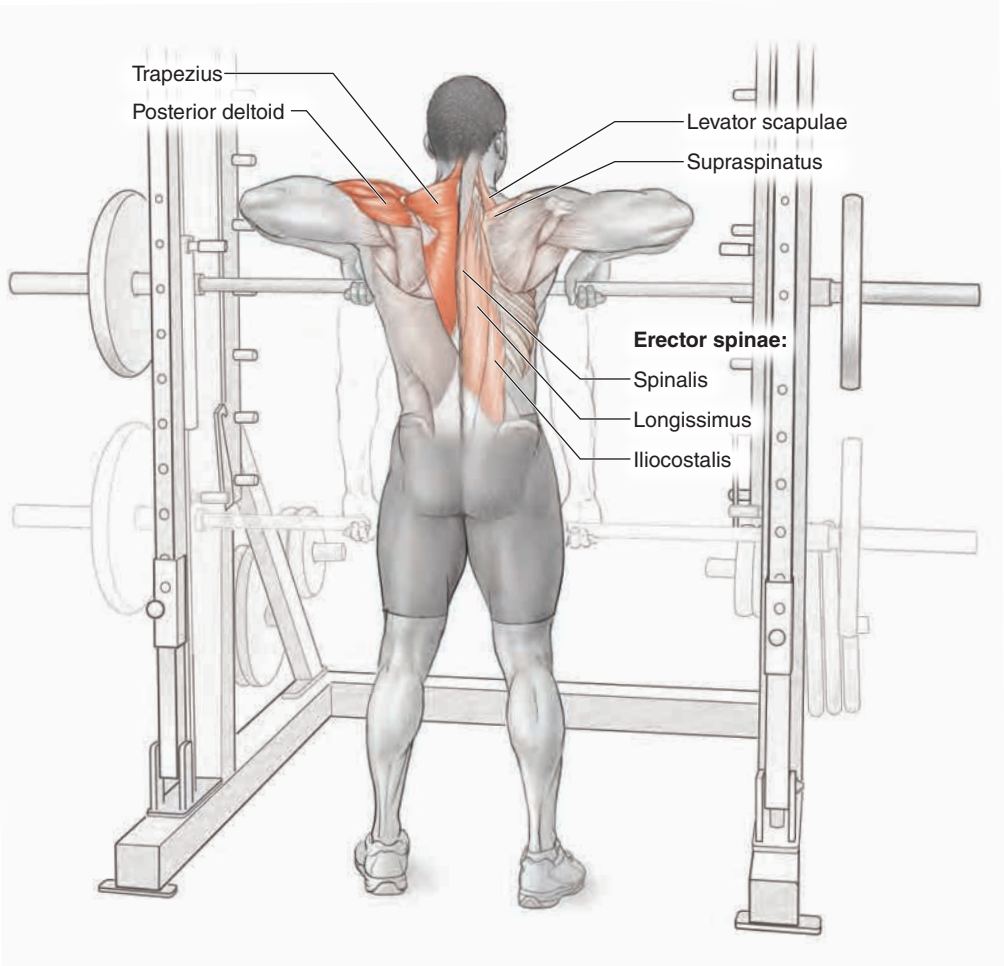
Hand spacing: A shoulder-width or narrower grip on the bar emphasizes the trapezius. A wider grip works the deltoid as well.

Body position: Performing the row while standing vertically upright hits the trapezius centrally. Tilting your torso slightly back at the waist targets the upper trapezius, whereas leaning slightly forward targets the muscle lower down the neck.

Trajectory: To emphasize the trapezius (not the deltoid), raise the bar close to your body during the exercise.

Range of motion: The higher the bar is raised, the harder the trapezius works. However, raising the bar higher also increases the risk of shoulder-impingement pain.

MACHINE UPRIGHT ROW



Execution

1. Using a Smith machine, hold the bar at arms' length using an overhand shoulder-width grip.
2. Pull the bar vertically upward until it reaches your chin, raising your elbows as high as possible.
3. Lower the bar slowly back down to the starting position.

Muscles Involved

Primary: Trapezius, posterior deltoid

Secondary: Levator scapulae, erector spinae (iliocostalis, longissimus, spinalis), supraspinatus, forearms (wrist extensors, finger extensors)

Anatomic Focus

Resistance: Using a Smith machine provides a single plane of vertical motion that can help focus your effort during the exercise.

Hand spacing: A shoulder-width or narrower grip on the bar emphasizes the trapezius, whereas a wider grip works the deltoid as well.

Body position: Performing the row while standing vertically upright hits the trapezius centrally. Tilting your torso slightly back at the waist targets the upper trapezius, whereas leaning slightly forward targets the muscle lower down the neck.

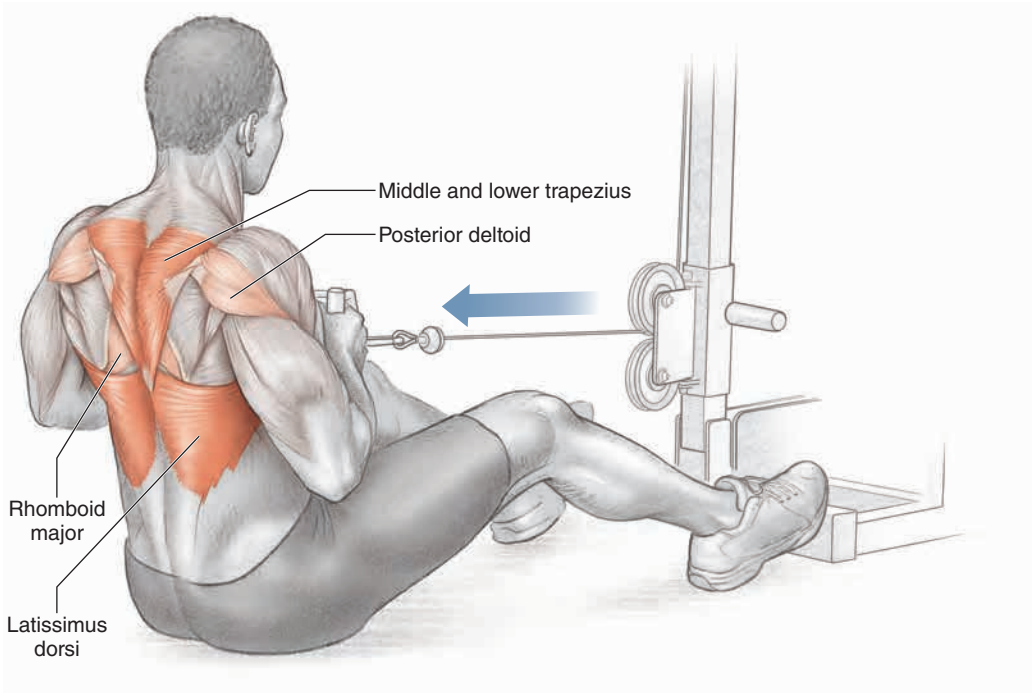
Range of motion: The higher the bar is raised, the harder the trapezius works. However, raising the bar higher also increases the risk of shoulder-impingement pain.

VARIATION

Cable Upright Row

Perform this exercise using a straight bar attached to the low pulley of a cable machine. See chapter 1 for instructions.

CABLE SEATED ROW



Execution

1. Sit at a cable machine. Grab the handles attached to a low pulley using a neutral (thumbs up) grip, with your arms extended in front of your body.
2. Pull the handles high toward your chest, keeping your spine straight.
3. Return the handles to the starting position.

Muscles Involved

Primary: Middle and lower trapezius, latissimus dorsi

Secondary: Rhomboid major, rhomboid minor, posterior deltoid

Anatomic Focus

Hand spacing: Spacing your hands farther apart targets the outer trapezius, whereas placing your hands closer together focuses on the inner portion of the trapezius.

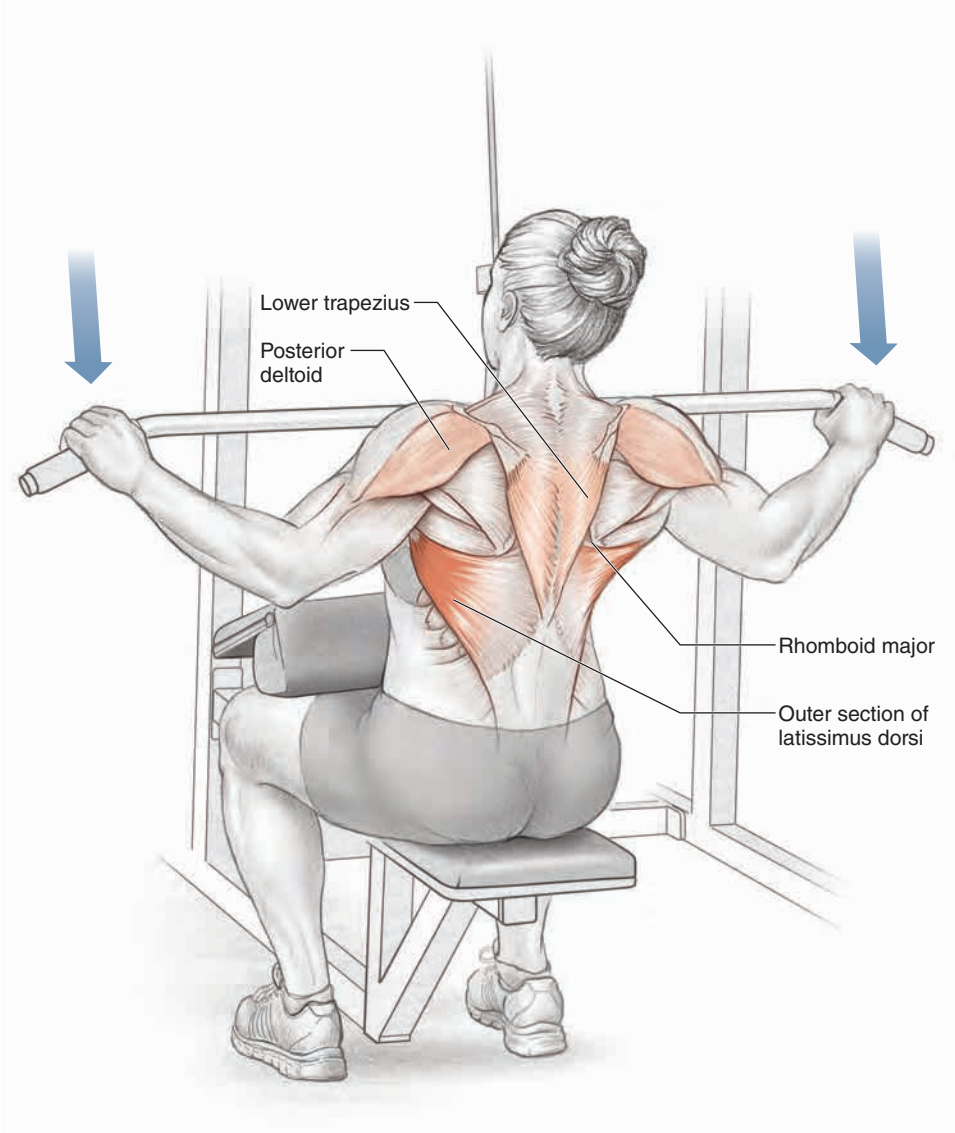
Grip: A pronated (overhand) grip tends to target the upper and middle trapezius, whereas a neutral grip (thumbs up) hits the middle and lower trapezius. A supinated (underhand) grip switches the focus to the latissimus dorsi.

Trajectory: To target the trapezius, pull the handles or bar through a high trajectory toward the chest. A low trajectory toward the abdomen works the latissimus dorsi.

Body position: Keep your back straight and your torso upright.

Range of motion: Pull your elbows up and back as far as possible. Squeeze your shoulder blades together to maximize muscle contraction.

WIDE-GRIP PULL-DOWN



Execution

1. Take an overhand grip on the high bar with hands 6 inches (15 cm) wider than shoulder width.
2. Pull the bar down to your upper chest, squeezing the latissimus dorsi.
3. Return the bar to the overhead starting position.

Muscles Involved

Primary: Outer section of the latissimus dorsi

Secondary: Posterior deltoid, lower trapezius, rhomboid major, rhomboid minor

Anatomic Focus

Hand spacing: As the hand spacing gets wider, the focus shifts to the outermost section of the latissimus dorsi under the armpit. This portion of the muscle creates width across the back.

Grip: An overhand (pronated) grip works best for this exercise. Grasping the angled section at the outer edges of the handlebar affords a better contraction in the latissimus dorsi.

Trajectory: When your torso is upright, the bar is pulled vertically downward using shoulder adduction, which emphasizes the outer latissimus. Leaning your torso back about 30 degrees from vertical creates a trajectory that uses shoulder extension, which emphasizes the inner lower latissimus.

Range of motion: To maximize range of motion, stretch the latissimus dorsi at the top position and squeeze the latissimus dorsi at the bottom of the movement by pulling the elbows down and back as far as possible.

VARIATIONS

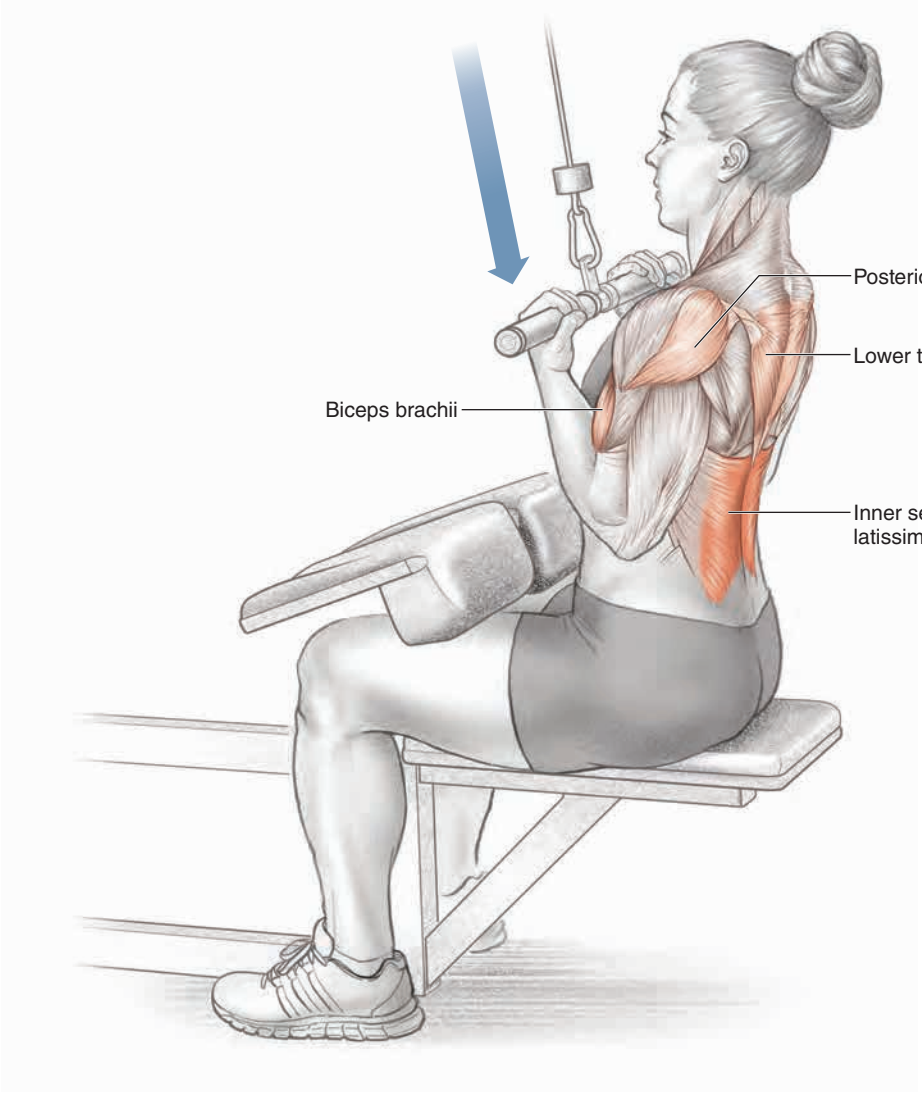
Handlebar Pull-Down

The angled ends of a wide-grip pull-down bar offer several advantages over a straight bar: improved trajectory, less stress through the wrist joint, and a few extra inches of motion before the bar touches the chest.

Behind-the-Neck Pull-Down

Pulling the bar down behind the neck is a less favorable trajectory that can cause injury to the shoulder joint.

CLOSE-GRIP PULL-DOWN



Execution

1. Take an underhand (reverse) grip on the high straight bar with hands spaced 6 to 12 inches (15-30 cm) apart.
2. Pull the bar down to your upper chest, squeezing the latissimus dorsi.
3. Return the bar to the overhead starting position.

Muscles Involved

Primary: Inner section of the latissimus dorsi

Secondary: Lower trapezius, rhomboid major, rhomboid minor, posterior deltoid, biceps brachii

Anatomic Focus

Hand spacing: As the hand spacing gets narrower, the focus shifts to the innermost section of the latissimus dorsi, generating thickness and depth in the middle back.

Grip: This exercise uses shoulder extension rather than adduction. The arms are pulled down and backward, which emphasizes the inner lower sections of the latissimus dorsi.

Trajectory: Leaning your torso back about 30 degrees from vertical improves trajectory and helps isolate the latissimus dorsi. Do not lean back too far or pull the weight down with momentum.

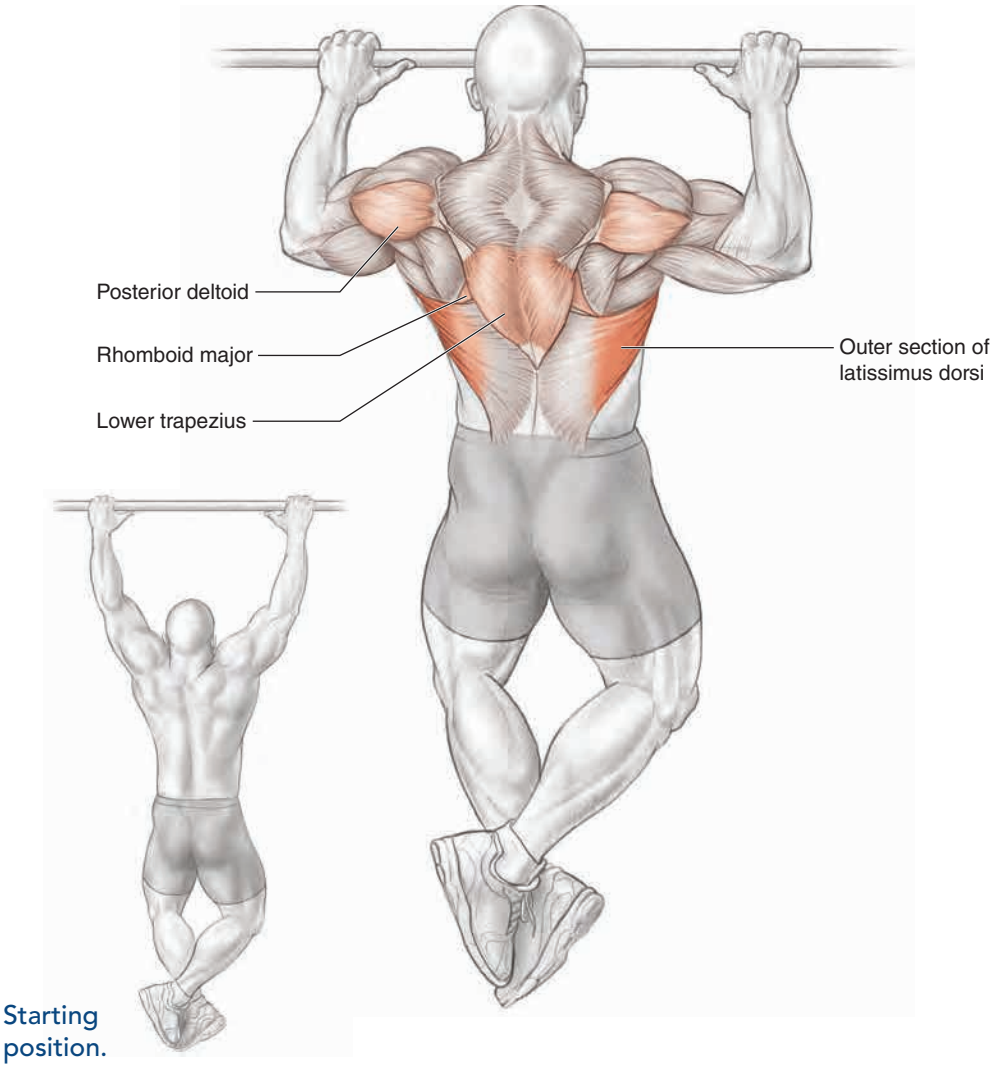
Range of motion: Stretch the latissimus dorsi at the top position and squeeze the latissimus dorsi at the bottom of the movement by pulling the elbows down and back as far as possible.

VARIATION

Handlebar Variation

Handlebar attachments allow a neutral grip (palms facing together). This hand position is midway between a pronated (overhand) grip and a supinated (underhand) grip. An overhand grip targets the outer latissimus dorsi, an underhand grip isolates the inner latissimus dorsi, and a neutral grip hits the muscle centrally.

WIDE-GRIP PULL-UP



Starting position.

Execution

1. Take an overhand grip on the pull-up bar with hands 6 inches (15 cm) wider than shoulder width and arms extended.
2. Pull your torso upward until your chin touches the bar.
3. Lower your torso slowly down to the starting position.

Muscles Involved

Primary: Outer section of the latissimus dorsi

Secondary: Posterior deltoid, lower trapezius, rhomboid major, rhomboid minor

Anatomic Focus

Resistance: Pull-ups are similar to pull-downs except that the resistance provided by your own body weight is not easily adjusted. Resistance may be added using a weighted belt, but clearly your body weight cannot be reduced.

Hand spacing: As the hand spacing gets wider, the focus shifts to the outermost section of the latissimus dorsi at the armpit. This portion of the muscle creates width across the back.

Grip: An overhand (pronated) grip works best for this exercise. An underhand (supinated) grip may be used during a close-grip pull-up. A neutral grip also may be used on some equipment (see variations).

Trajectory: Because the torso remains vertical during the movement, pull-ups primarily use shoulder adduction and therefore tend to work the outer latissimus dorsi.

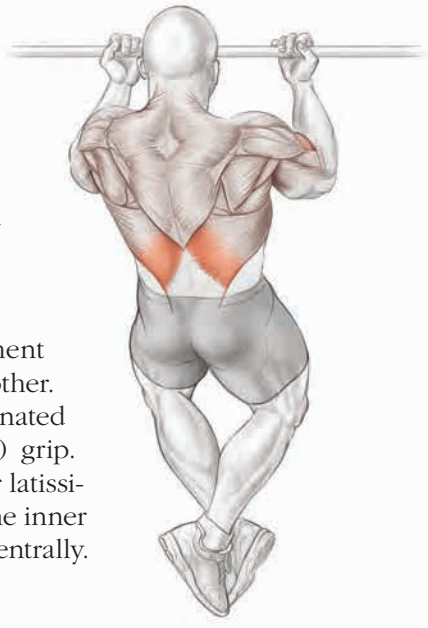
Range of motion: To maximize range of motion, stretch the latissimus dorsi at the bottom position and squeeze the latissimus dorsi at the top of the movement by pulling the elbows down and back.

Body position: Crossing one foot over the other and slightly bending the knees minimizes body swing during the movement.

VARIATIONS

Close-Grip Pull-Up

An underhand (supinated) grip on the bar facilitates a closer hand spacing, emphasizing shoulder extension rather than adduction. As the hand spacing gets narrower, the focus shifts to target the inner lower section of the latissimus dorsi. With an underhand grip, the greater contribution from the biceps brachii provides added strength.



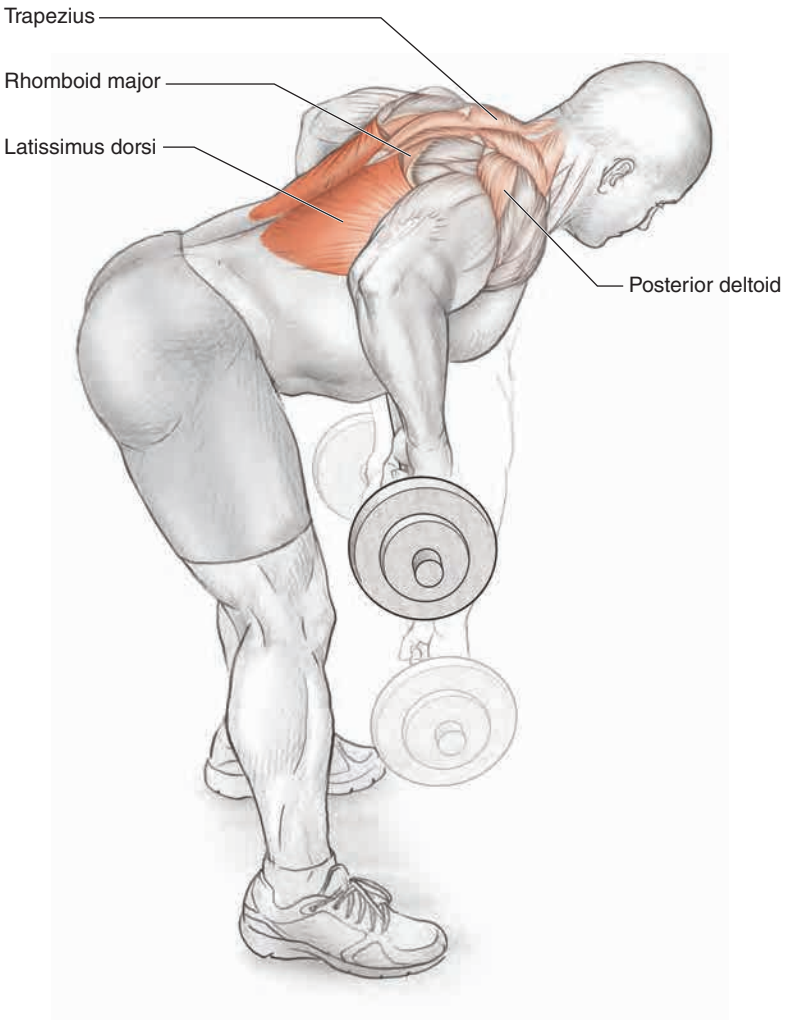
Handlebar Pull-Up

The handlebar attachment on some equipment allows a neutral grip with palms facing each other. This hand position is midway between a pronated (overhand) grip and a supinated (underhand) grip. Whereas a wide overhand grip targets the outer latissimus dorsi and a close underhand grip isolates the inner latissimus dorsi, a neutral grip hits the muscle centrally.

Behind-the-Neck Pull-Up

Pulling up with the back of your neck touching the bar is a less favorable trajectory that may cause irritation to the shoulder joint.

BARBELL ROW



Execution

1. Take an overhand shoulder-width grip on the barbell with your arms extended. Bend your torso forward 45 degrees to the floor.
2. Pull the bar vertically upward to touch your lower chest, keeping your spine straight and knees slightly bent.
3. Lower the bar down to the starting position.

Muscles Involved

Primary: Latissimus dorsi

Secondary: Erector spinae (iliocostalis, longissimus, spinalis), trapezius, rhomboid major, rhomboid minor, posterior deltoid

Anatomic Focus

Hand spacing: Spacing your hands shoulder-width apart or closer targets the central inner section of the latissimus dorsi, whereas a wider grip targets the outer latissimus dorsi.

Grip: An underhand (supinated) grip on the bar facilitates a closer hand spacing, emphasizing shoulder extension and targeting the central inner section of the latissimus dorsi. With an underhand grip, a greater contribution from the biceps brachii provides added strength during the row.

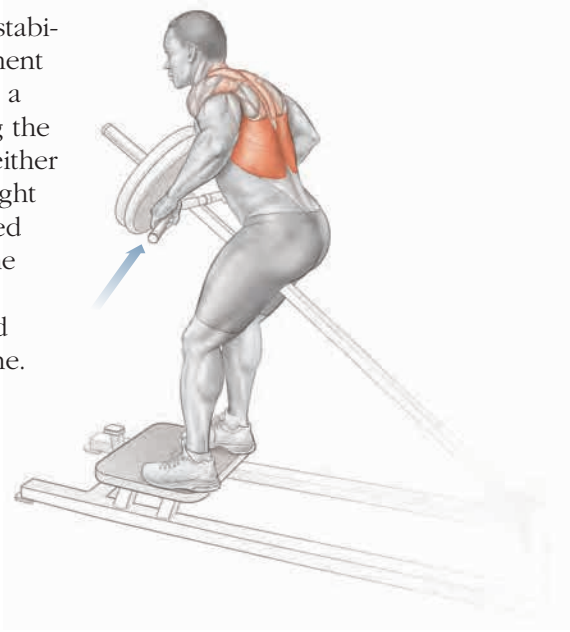
Trajectory: Pulling the bar up higher toward the chest targets the upper latissimus dorsi and trapezius. Pulling the bar through a lower trajectory to touch the abdomen targets the lower latissimus dorsi.

Body position: Keep your spine straight. Never round the lower back in an attempt to lower the bar farther because doing so will provoke injury.

VARIATION

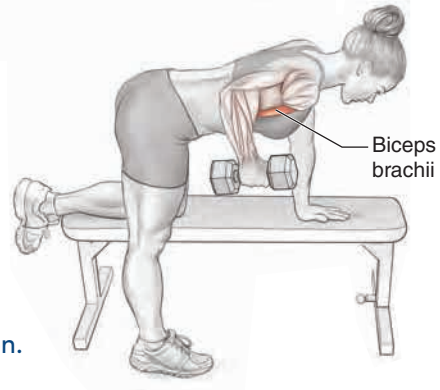
T-Bar Row

This variation requires less effort to stabilize body position during the movement because one end of the bar pivots at a fixed point on the floor. Stand facing the loaded end with feet positioned on either side of the bar. With your spine straight and knees slightly bent, lift the loaded end using the T-bar attachment. Some row apparatuses provide an inclined chest pad that supports the torso and minimizes load across the lower spine.



DUMBBELL ROW





End position.

Execution

1. Grasp a dumbbell in one hand with your palm facing in. Rest the opposite hand and knee on a bench, keeping your spine straight and just above parallel to the floor.
2. Pull the dumbbell vertically upward alongside your torso, raising your elbow as high as possible.
3. Lower the dumbbell down to the starting position.

Muscles Involved

Primary: Latissimus dorsi

Secondary: Trapezius, rhomboid major, rhomboid minor, posterior deltoid, erector spinae (iliocostalis, longissimus, spinalis), biceps brachii

Anatomic Focus

Grip: A neutral grip with the dumbbell parallel to the torso works best. The dumbbell will tend to jam against your torso if a pronated or supinated grip is attempted.

Trajectory: Pulling the dumbbell toward the chest works the upper latissimus dorsi and lower trapezius. Raising the dumbbell through a lower trajectory toward the abdomen targets the lower latissimus dorsi.

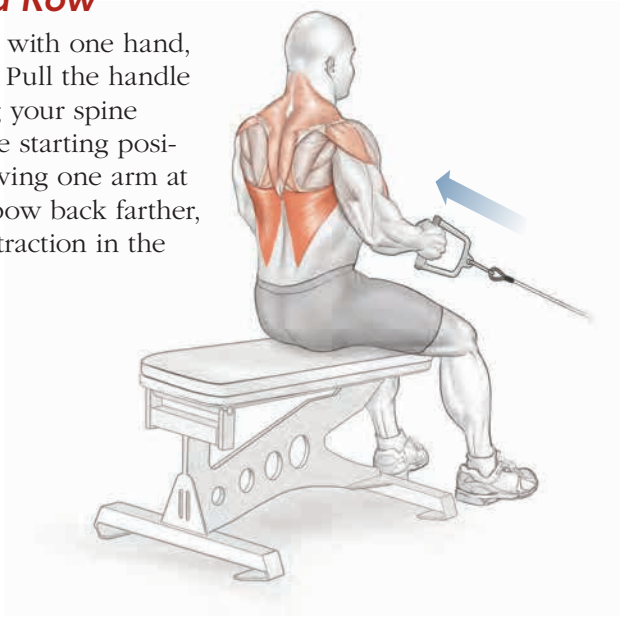
Range of motion: Maximize the range of motion by stretching the latissimus dorsi at the bottom position and raising the elbow as high as possible at the top of the movement.

Body position: Supporting your torso on the bench reduces stress through the spine.

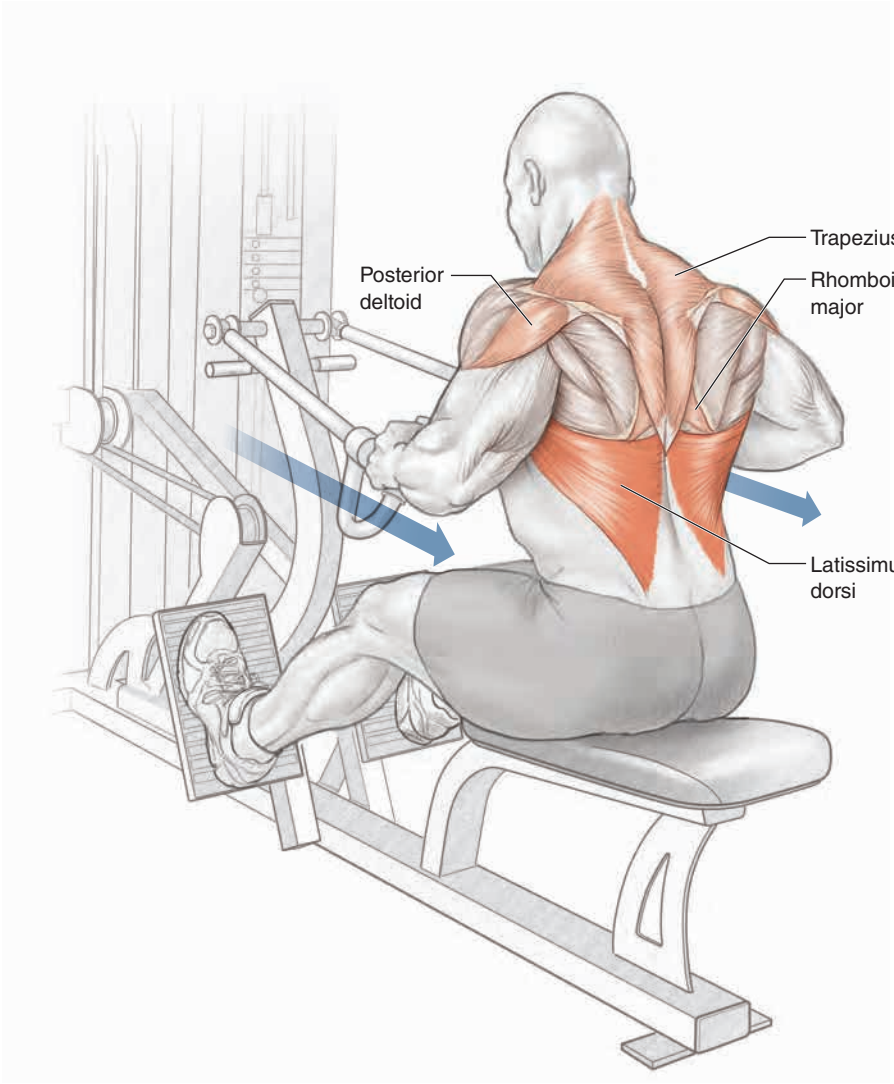
VARIATION

One-Arm Cable Seated Row

Grab the handle of a low pulley with one hand, using a neutral (thumb-up) grip. Pull the handle high toward your chest, keeping your spine straight. Return the handle to the starting position with the arm extended. Rowing one arm at a time allows you to pull the elbow back farther, thereby maximizing muscle contraction in the latissimus dorsi.



MACHINE ROW



Execution

1. Grab the handles of the machine with your arms extended in front of your body. If the machine has a chest pad, support your torso against the pad.
2. Pull the handles toward your upper abdomen, keeping your spine straight.
3. Return the weight to the starting position.

Muscles Involved

Primary: Latissimus dorsi

Secondary: Trapezius, rhomboid major, rhomboid minor, posterior deltoid

Anatomic Focus

Hand spacing: Spacing your hands farther apart targets the outer latissimus dorsi, whereas spacing your hands closer together isolates the inner latissimus dorsi.

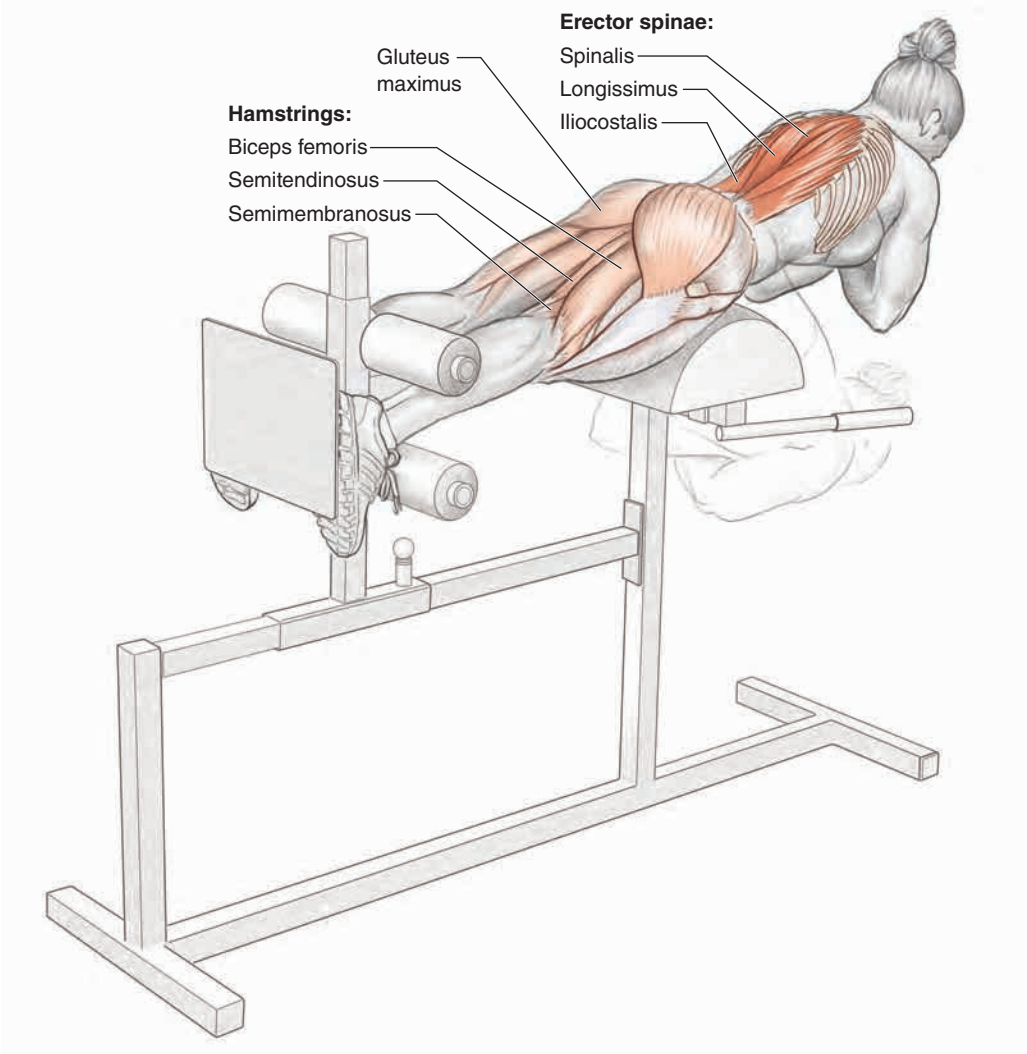
Grip: A pronated (overhand) grip tends to target the upper and outer latissimus dorsi, a neutral (thumbs up) grip hits the central section of the back, and a supinated (underhand) grip works the lower latissimus dorsi. As the grip changes from pronation to neutral to supination, the elbows move progressively closer to the sides of your body.

Trajectory: Pulling the handles through a high trajectory toward the chest targets the upper latissimus dorsi and trapezius, whereas a lower trajectory toward the abdomen targets the lower latissimus dorsi. Adjust the seat height to change trajectory. Raising the seat creates a low trajectory; lowering the seat provides a high trajectory.

Range of motion: Pull your elbows back as far as possible and squeeze your shoulder blades together to maximize muscle contraction.

Body position: Load across the spine is reduced when the torso is supported against a chest pad.

LUMBAR EXTENSION



Execution

1. Lie facedown with your hips supported on the lumbar extension bench and your ankles secured under the pads.
2. Begin with your torso hanging down, bent 90 degrees at the waist.
3. Raise your upper body until your torso is just above parallel to the floor.

Muscles Involved

Primary: Erector spinae (iliocostalis, longissimus, spinalis)

Secondary: Latissimus dorsi, gluteus maximus, hamstrings (semitendinosus, semimembranosus, biceps femoris)

Anatomic Focus

Hand position: Hands may be interlocked behind your lower back or folded across your chest.

Resistance: Add resistance by holding a weight plate against the front of your chest.

Trajectory: You can perform the movement at an incline (see variations).

Range of motion: Your torso should move up and down through an arc of about 90 degrees. Avoid hyperextending your spine. The erector spinae muscles stabilize and straighten the spine, while the gluteus maximus and hamstrings generate hip extension.

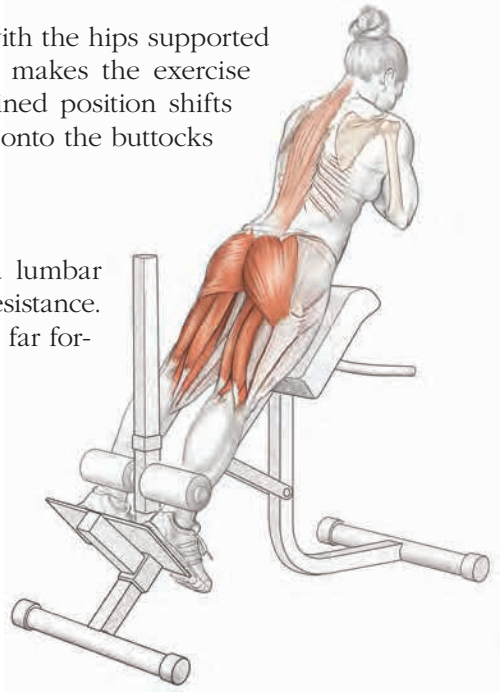
VARIATIONS

Incline Lumbar Extension

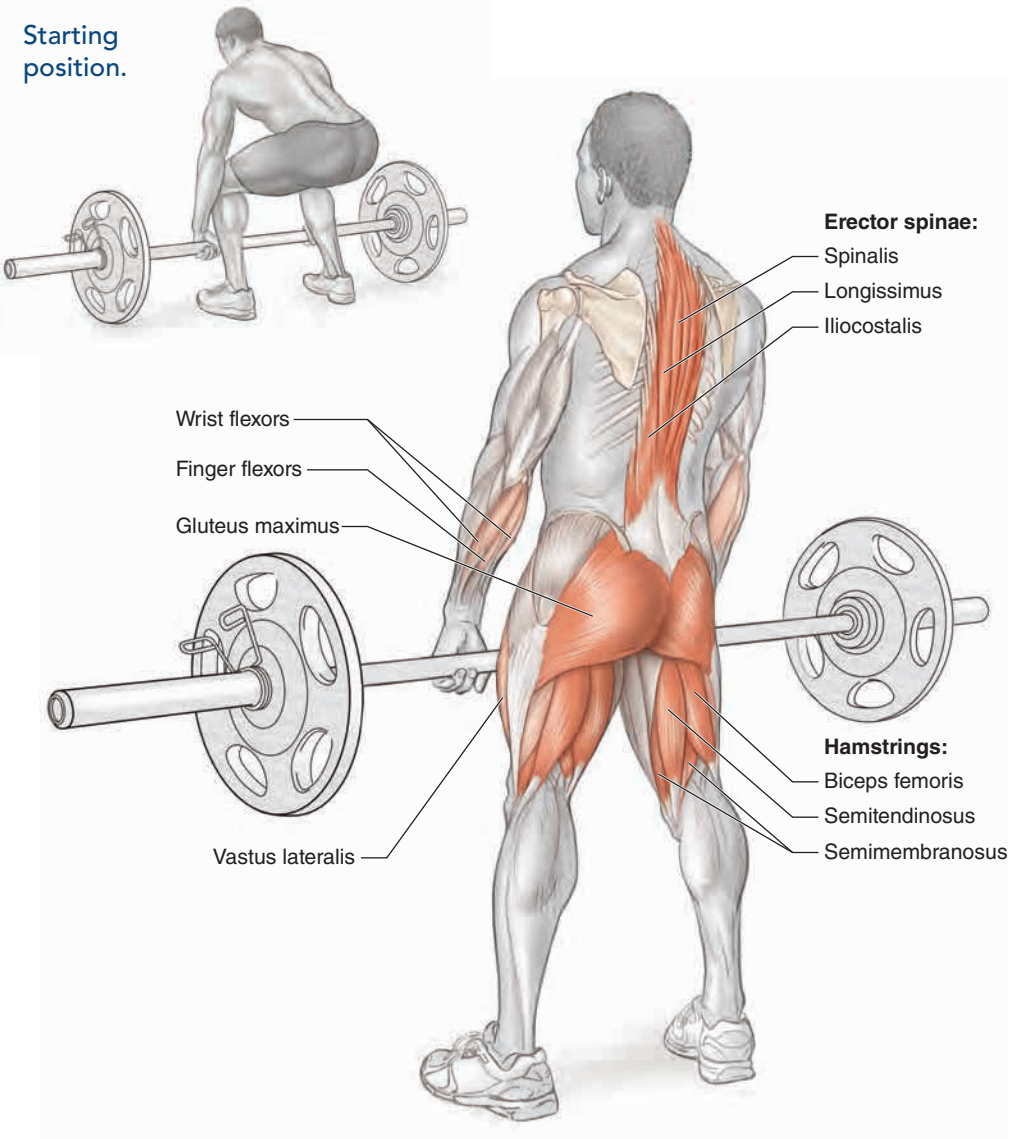
Performing the movement at an incline with the hips supported high and the ankles closer to the floor makes the exercise easier. The disadvantage is that the inclined position shifts the focus away from the lumbar muscles onto the buttocks and hamstrings.

Machine Lumbar Extension

Perform the exercise while seated on a lumbar extension machine that provides variable resistance. To avoid injury, do not flex the spine too far forward or extend too far backward.



DEADLIFT



Execution

1. Take a shoulder-width overhand grip on the barbell with arms extended. Squat down, bending the knees and hips.
2. Keeping your spine straight and elbows stiff, stand upright, lifting the bar upward to hip level.
3. Slowly lower the bar back to the floor by bending at the knees and hips.

Muscles Involved

Primary: Erector spinae (iliocostalis, longissimus, spinalis), gluteus maximus, hamstrings (semitendinosus, semimembranosus, biceps femoris)

Secondary: Trapezius, latissimus dorsi, quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), forearms (wrist flexors, finger flexors)

Anatomic Focus

Hand spacing: Hands should be spaced shoulder-width apart so that the arms hang vertically and the hands pass along the outer thighs.

Grip: An over–under grip with one palm facing forward and the other facing back prevents the bar from rolling.

Stance: Position your feet directly below your hips with toes pointing straight ahead.

Trajectory: The bar should travel straight up and down and stay close to the body.

Range of motion: Lift the barbell from the floor to the tops of your thighs, keeping your arms extended and your elbows stiff. During this movement, the erector spinae muscles stabilize and straighten the spine while the gluteus maximus and hamstrings generate hip extension. Keep the spine straight throughout the movement. Do not round your lower back forward or extend the spine too far backward.

VARIATIONS

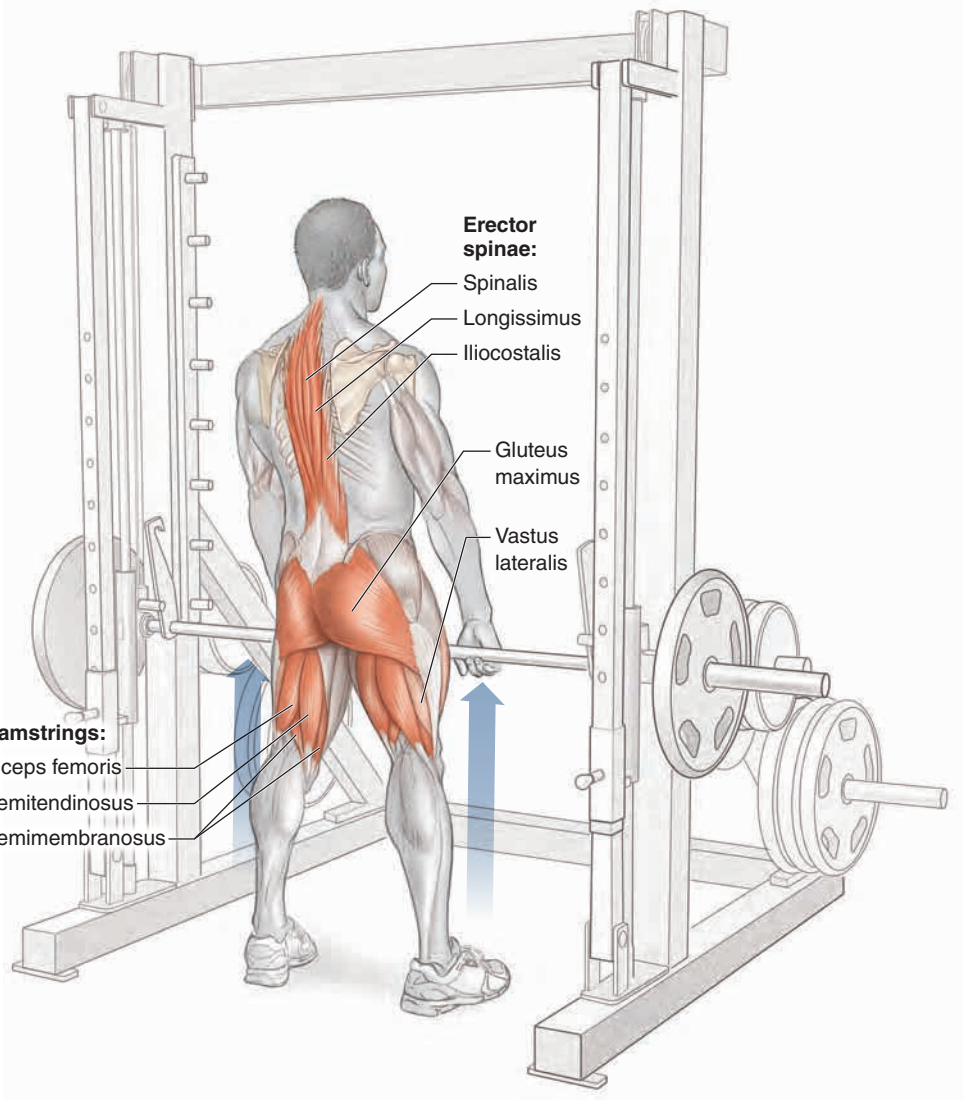
Barbell Stiff-Legged Deadlift

Performing the deadlift with your legs stiff shifts the focus from the lower back to the buttocks and hamstrings. See chapter 5 for instructions.

Sumo-Style Deadlift

Performing the lift with a stance wider than hip-width places the emphasis on the thigh muscles.

MACHINE DEADLIFT



Execution

1. Standing upright, hold the bars of a Smith machine at arms' length using an overhand shoulder-width grip.
2. Bend forward at the waist and lower the bar downward, keeping your spine straight and elbows stiff.
3. Lift the bar back up to the starting position.

Muscles Involved

Primary: Erector spinae (iliocostalis, longissimus, spinalis), gluteus maximus, hamstrings (semitendinosus, semimembranosus, biceps femoris)

Secondary: Trapezius, latissimus dorsi, quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius)

Anatomic Focus

Resistance: A Smith machine provides a single plane of vertical motion that can help focus your effort during the exercise.

Hand spacing: Hands should be spaced shoulder-width apart so that the arms hang vertically and the hands pass along the outer thighs.

Grip: An overhand grip maintains the Smith machine bar in the unlocked position so the bar's latches remain clear of the uprights.

Stance: Position your feet directly below your hips with toes pointing straight ahead.

Trajectory: The bar should travel straight up and down and stay close to the body.

Body position: A slight bend in the knees helps with execution. Keep the spine straight throughout the movement. Do not round the lower back forward or extend the spine too far backward.

Range of motion: Move the bar from hip level to down beyond the knees and back up again, keeping your arms extended and your elbows stiff. During this movement, the erector spinae muscles stabilize and straighten the spine while the gluteus maximus and hamstrings generate hip extension.

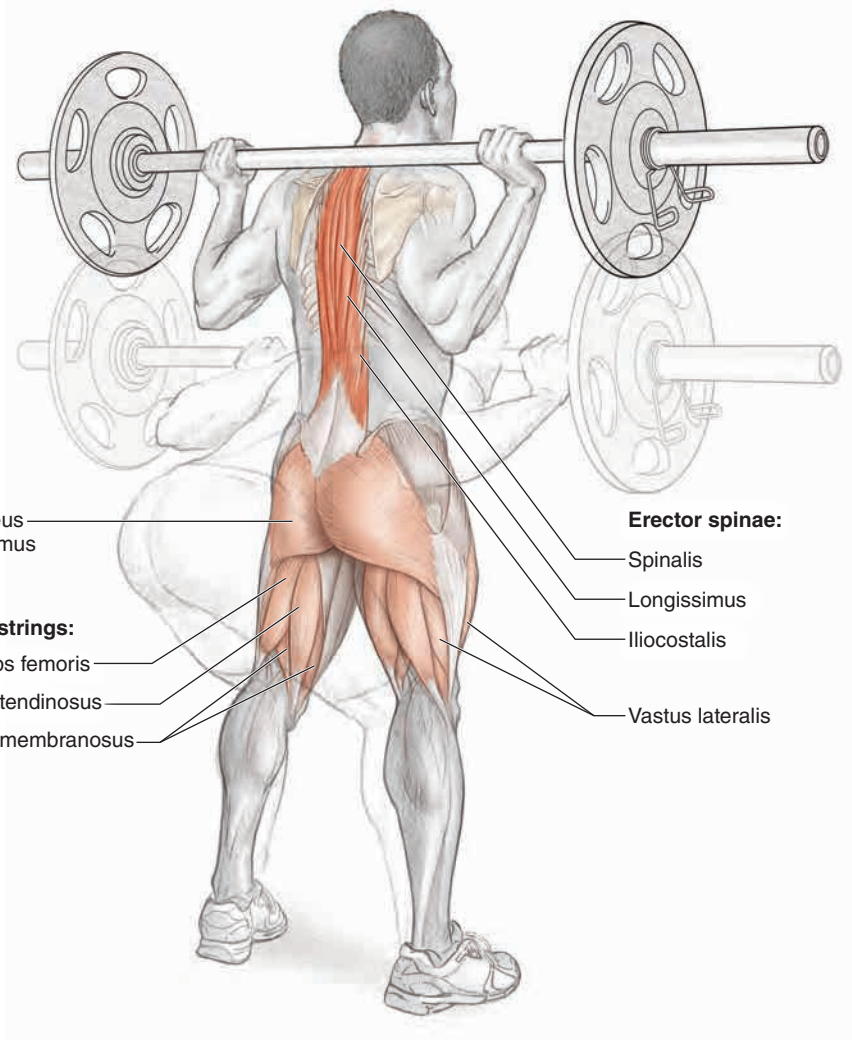
VARIATION

Cable Pull-Through

Stand facing away from a low pulley and perform the lift using a short bar with the cable passing between your legs.



GOOD MORNING



Execution

1. Stand upright with a barbell resting across your shoulders.
2. Keeping your spine straight and knees stiff (straight or slightly bent), bend forward at the waist until your torso is just above parallel to the floor.
3. Raise your torso back to the upright position.

Muscles Involved

Primary: Erector spinae (iliocostalis, longissimus, spinalis)

Secondary: Latissimus dorsi, gluteus maximus, hamstrings (semitendinosus, semimembranosus, biceps femoris)

Anatomic Focus

Grip: Place your hands slightly wider than shoulder-width apart using an overhand grip to secure the barbell across your shoulders.

Trajectory: A slight bend in the knees helps execution.

Range of motion: Your torso should move up and down through an arc of about 90 degrees. Keep your spine straight and your head up, and avoid bending your torso below parallel to the floor. During this movement, the erector spinae muscles stabilize and straighten the spine while the gluteus maximus and hamstrings generate hip extension.

VARIATION

Machine Lift

Perform this lift while seated, using a pad across your upper back to provide resistance.

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chapter 4

ARMS

Your arm is divided into the upper arm and lower arm (forearm; figure 4.1). The upper arm consists of one bone, the humerus, whereas the forearm consists of two bones, the radius (located on the thumb side) and ulna (located on the little-finger side). The elbow is a hinge joint formed at the junction of the humerus, radius, and ulna. Two movements occur at the elbow joint: flexion and extension. During elbow flexion, the forearm moves toward the upper arm. During extension, the forearm moves away from the upper arm. Movement also takes place in the forearm when the radius rotates around the ulna. Supination (palm up) and pronation (palm down) take place between the radioulnar joints. The wrist joint is the junction between the lower end of the forearm bones and the small bones in the hand.

BICEPS BRACHII

As its name suggests, the biceps brachii muscle has two heads. The short head attaches to the coracoid process, and the long head arises from above the glenoid of the shoulder joint. The two-headed muscle passes down alongside the humerus and attaches about 1.5 inches (4 cm) below the elbow joint onto a tuberosity on the inside of the radius bone. The biceps brachii causes flexion at the elbow joint, such as when raising the hand toward the face. The biceps brachii also causes supination of the forearm, such as when rotating the hand so that the palm faces up.

In addition to the biceps brachii, two other muscles flex (bend) the elbow: the brachialis and brachioradialis. The brachialis muscle lies deep beneath the biceps brachii, arising from the lower half of the humerus and attaching to the ulna bone just below the elbow joint. The brachialis lifts the ulna at the same time that the biceps brachii lifts the radius. The brachioradialis muscle arises from the outer aspect of the lower end of the humerus and then travels down the forearm to attach to the radius just above the wrist joint.

TRICEPS BRACHII

The triceps brachii muscle has three heads, or sections. The long head arises from beneath the glenoid fossa of the shoulder joint, the lateral (outer) head arises from the outer surface of the humerus, and the medial (inner) head arises from the medial and rear surfaces of the humerus. All three heads fuse at their lower ends to form a single tendon that attaches behind the elbow joint onto the olecranon process of the ulna bone. The triceps brachii causes extension at the elbow, such as when

moving the hand away from the face. The triceps brachii is the only muscle that straightens the elbow joint, whereas three muscles (biceps brachii, brachialis, and brachioradialis) bend the elbow. All three heads of the triceps muscle cross the elbow joint, but the long head also crosses beneath the shoulder joint.

FOREARM

The forearm is a mass of 20 muscles. It has two separate muscle compartments: the flexor group on the palm side and the extensor group on the reverse side. The fleshy muscle portions of almost all these muscles are located in the upper two-thirds of the forearm.

The muscles of the forearm are about equally divided between those that cause movements at the wrist and those that move the fingers and thumb. The ***wrist*** flex-

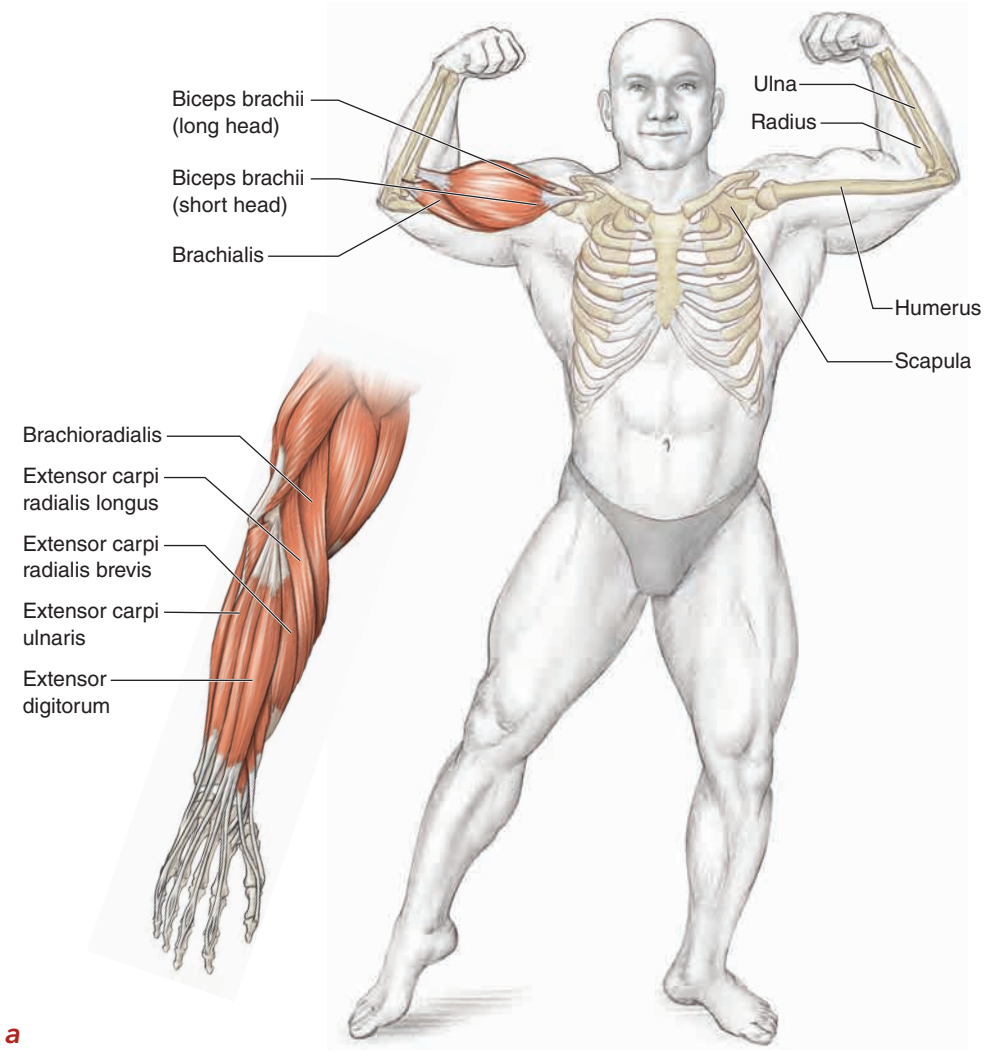
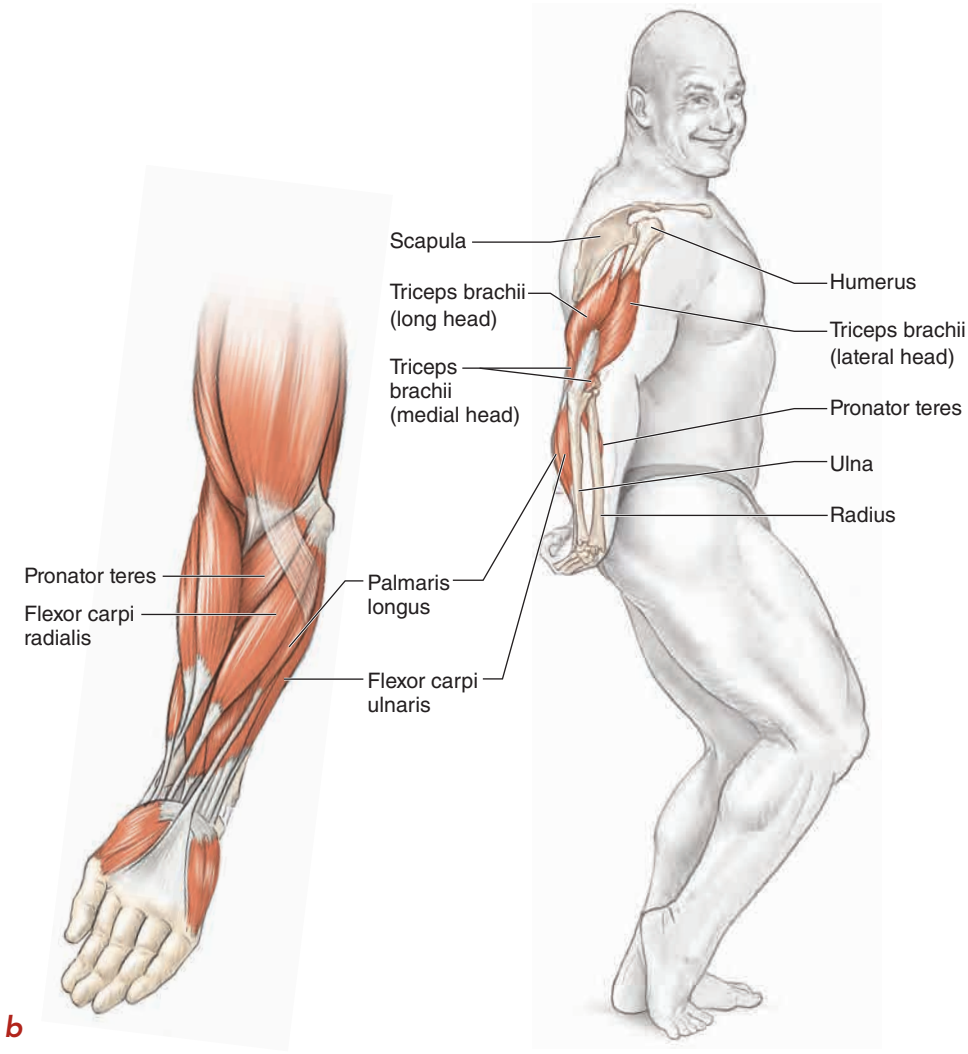


Figure 4.1 Showcasing the arms: *(a)* front view; *(b)* side view.

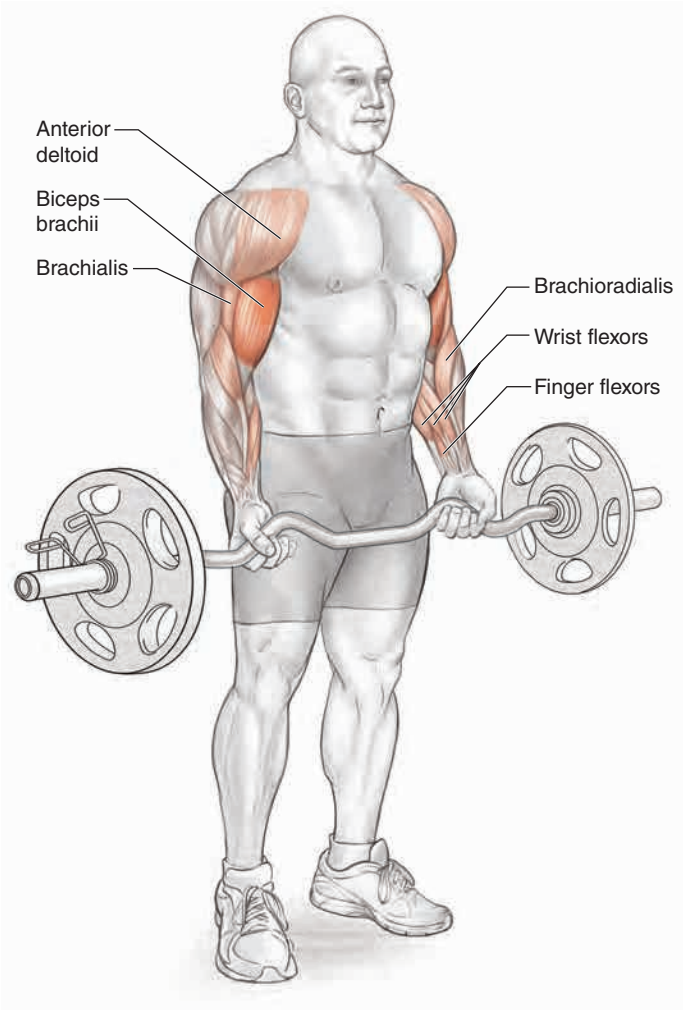
ors and extensors are superficial (under the skin), whereas the ***finger*** flexors and extensors are deep (close to the bone). The superficial group of wrist flexors and extensors cross both the wrist and elbow joints, so therefore have a greater stretch when wrist curls are performed with the elbow joint straight. The wrist flexors are the palmaris longus, flexor carpi radialis, and flexor carpi ulnaris. The wrist extensors are extensor carpi radialis longus, extensor carpi radialis brevis, and extensor carpi ulnaris.

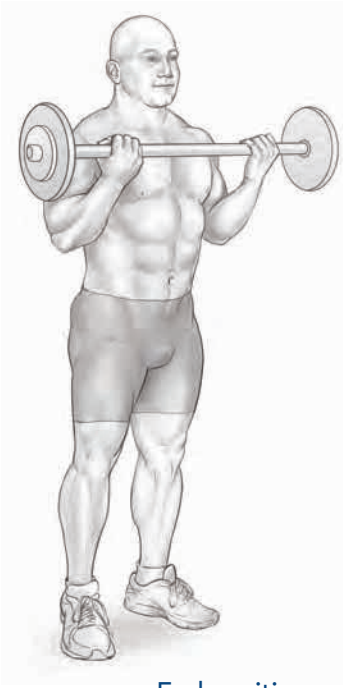
The finger flexors are the flexor digitorum superficialis, flexor digitorum profundus, and flexor pollicis longus. The finger extensors are the extensor digitorum, extensor pollicis longus, extensor pollicis brevis, and extensor indicis.

Supination, or rotating the hand so the palm faces up, is performed by the supinator and biceps brachii muscles. Pronation, or rotating the hand so the palm faces down, is performed by the pronator teres and pronator quadratus.



BARBELL CURL





End position.

Execution

1. Hold a barbell at arms' length using a shoulder-width underhand grip.
2. Curl the bar up to shoulder level by bending your elbows.
3. Lower the bar back down to the starting position.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, anterior deltoid, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Hand spacing: A wide grip focuses effort on the inner biceps brachii (short head), whereas a narrow grip works the outer biceps brachii (long head).

Grip: With a straight bar, the underhand grip is fixed in supination (palms facing up). The grip may be adjusted using an EZ bar (see variation).

Trajectory: The bar should move up and down in an arc close to the body. To isolate the biceps brachii, motion should occur at the elbows and not the shoulders.

Range of motion: Stopping a few degrees short of full elbow extension keeps tension on the biceps brachii as the barbell is lowered.

Body position: Stand upright with the spine straight. Tilting the torso cheats the bar upward with momentum: Leaning slightly forward makes the initial phase of the curl easier, and leaning slightly backward helps complete the final phase of the repetition.

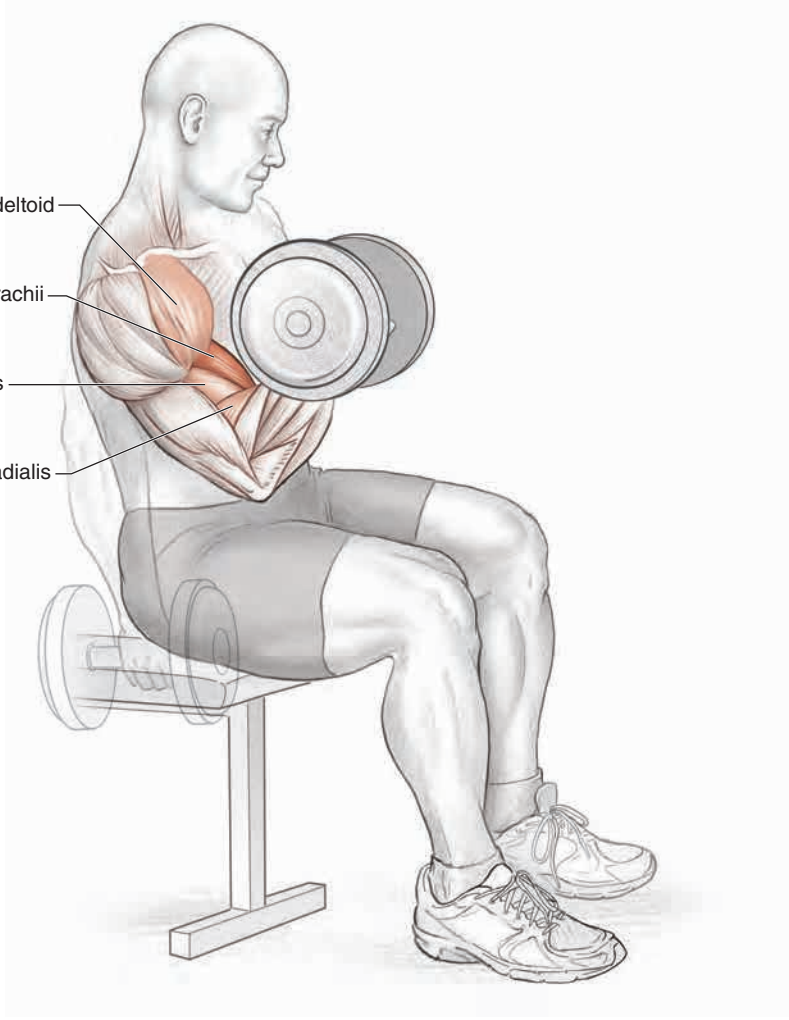
VARIATION

EZ-Bar Curl

Performing the curl with an EZ bar change the grip. The hands switch from the fully supinated (palms facing up) grip to a less supinated, nearly neutral (palms facing in) grip. This hand position emphasizes the outer (long) head of the biceps brachii and the brachialis and is less strenuous on the wrist joints.



DUMBBELL CURL



Execution

1. Sit on the edge of a weight bench, both feet planted on the floor. Hold a dumbbell in each hand at arms' length by your sides, thumbs pointing forward.
2. One arm at a time, curl the dumbbell up toward your shoulder, rotating your hand so your palm faces upward.
3. Lower the dumbbell back down to the starting position and repeat with the opposite arm.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, anterior deltoid, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Grip: The dumbbell curl works the biceps brachii in two ways: elbow flexion and forearm supination. Hence, to maximize contraction of the biceps brachii, supinate the hand (palm facing up) as the dumbbell is raised.

Hand spacing: Instead of grasping the dumbbell in the middle of the bar, slide your palm over so your thumb rests against the inside of the plate. This grip change increases the load on the biceps brachii during supination, activating more muscle fibers when the dumbbell is rotated.

Trajectory: Position your torso upright with your spine straight. Tilting the torso cheats the weight upward with momentum: Leaning slightly forward makes the initial phase of the curl easier, and leaning slightly backward helps complete the final phase of the repetition.

Range of motion: Use a full range of motion at the elbow.

VARIATIONS

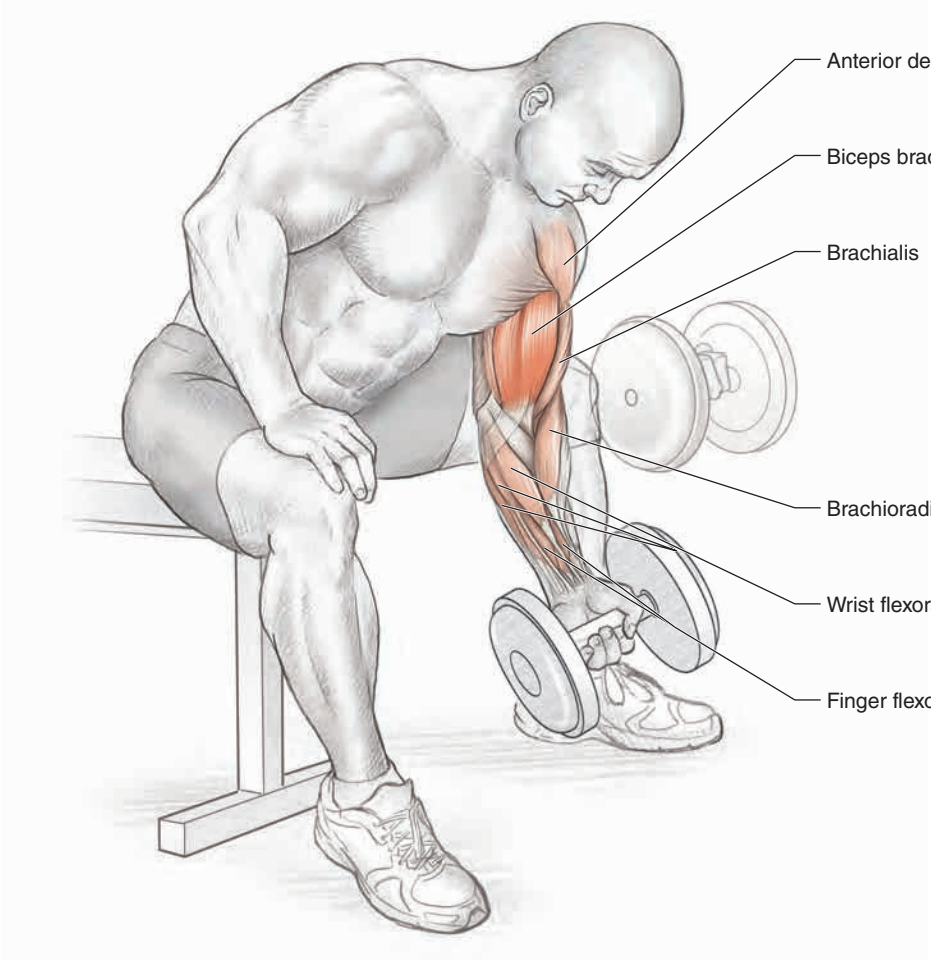
Dumbbell Standing Curl

This exercise can be performed in a standing position, but this requires muscular effort in the legs. The seated version of this exercise affords better focus.

Dumbbell Incline Curl

Performing this exercise while seated on an incline bench helps focus effort on the lower portion of the biceps brachii, near the elbow.

CONCENTRATION CURL



Execution

1. Sit on the edge of a bench. Hold a dumbbell in one hand at arm's length, supporting your arm against the inside of your thigh. Place your free hand on your other thigh.
2. Curl the dumbbell up toward your shoulder by bending at the elbow.
3. Lower the dumbbell back down to the starting position.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Grip: An underhand grip places the hand in supination and thereby maximizes contraction of the biceps brachii.

Trajectory: The position of the upper arm relative to the floor changes the focus of effort. When the arm is vertical (shoulder directly above the elbow), resistance increases as the dumbbell is raised and effort is focused on the upper biceps brachii (peak). When the arm is at an inclined angle (elbow in front of the shoulder), resistance is maximal at the start, so effort targets the lower section of the biceps brachii at the elbow.

Range of motion: Resting the upper arm against the thigh prevents movement at the shoulder and is an excellent way to isolate the biceps brachii.

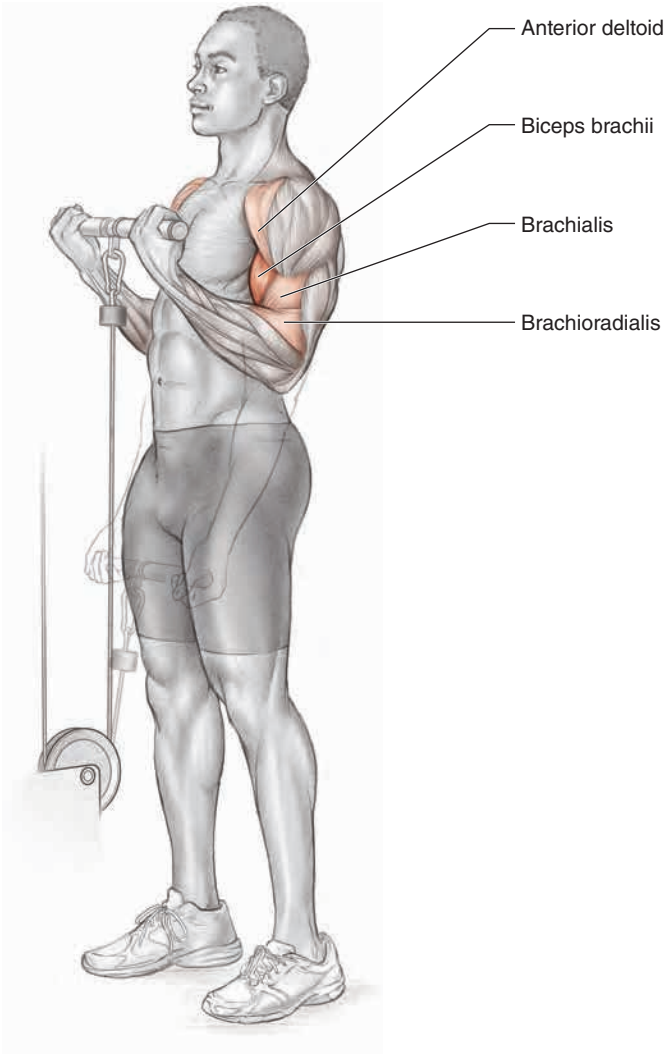
Body position: The torso, supported by your free hand on the opposite thigh, should remain motionless.

VARIATION

One-Arm Cable Curl

Perform this exercise using a D-handle attached to the cable of a low pulley.

CABLE CURL



Execution

1. Facing the weight stack, grasp the short bar attached to a low pulley using an underhand grip with arms straight.
2. Curl the bar up toward your shoulders by bending at the elbows.
3. Lower the bar back down to the starting position.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, anterior deltoid, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Hand spacing: A grip that is wider than shoulder width focuses effort on the inner biceps brachii (short head), whereas a narrow grip works the outer biceps brachii (long head).

Grip: With a straight bar, the underhand grip is fixed in supination (palms facing up). Using an EZ bar, the grip switches from the fully supinated position to a less supinated, nearly neutral (palms facing in) grip. This hand position is less strenuous on the wrist joint and tends to emphasize the outer (long) head of the biceps brachii and the brachialis.

Body position: Stand upright with the spine straight.

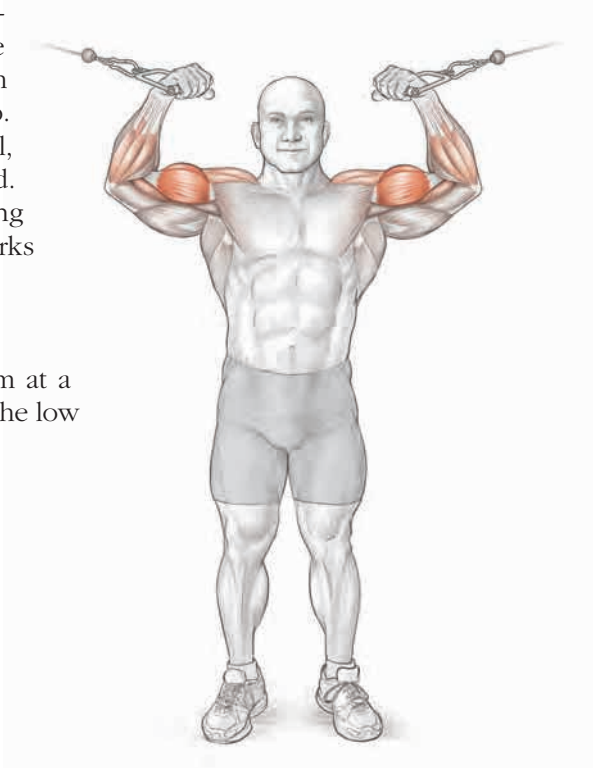
Range of motion: Fixing your elbows against your sides prevents movement at the shoulder and is an excellent way to isolate the biceps brachii.

Resistance: Unlike barbell or dumbbell curls, in which the resistance varies during the lift, the cable pulley provides uniform resistance throughout the movement.

VARIATIONS

High-Pulley Curl

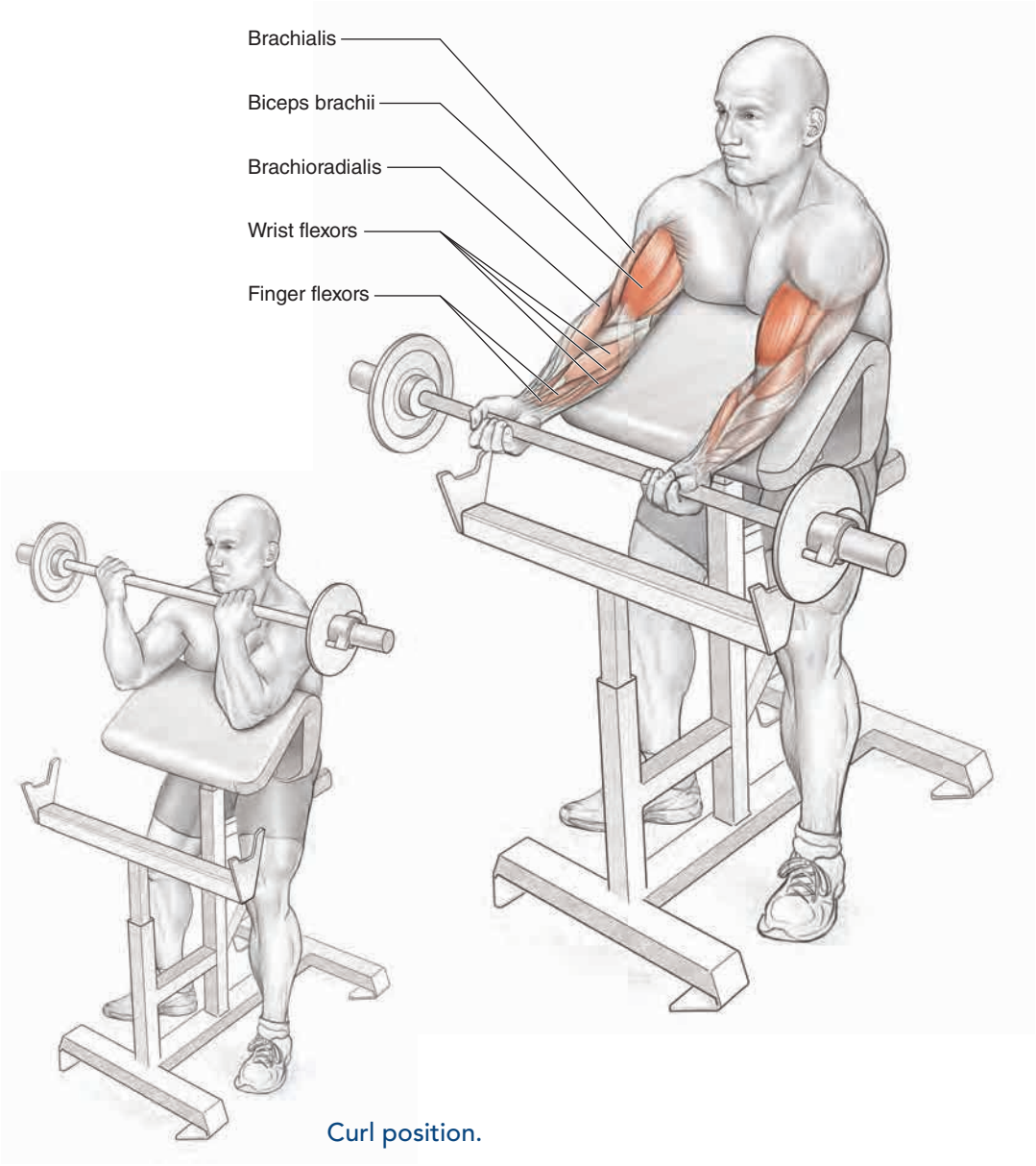
Standing midway between the pulleys on a cable machine, grasp the D-handles attached to two high pulleys using an underhand grip. Holding your arms at shoulder level, curl the handles toward your head. This version emphasizes the long head of the biceps brachii and works the biceps brachii peak.



One-Arm Cable Curl

Perform this exercise with one arm at a time using a D-handle attached to the low pulley of a cable machine.

BARBELL PREACHER CURL



Curl position.

Execution

1. Sitting with your upper arms resting on the preacher bench, take a shoulder-width underhand grip on the bar with your arms out straight.
2. Curl the bar up toward your shoulders.
3. Lower the weight back down to the starting position.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Hand spacing: A wide grip focuses effort on the inner biceps brachii (short head), whereas a narrow grip works the outer biceps brachii (long head).

Grip: With a straight bar, the underhand grip is fixed in supination (palms facing up). You may adjust the grip using an EZ bar (see variation).

Trajectory: When the upper arms are supported at an inclined angle, resistance is maximal at the start, so effort is targeted on the lower section of the biceps brachii near the elbow.

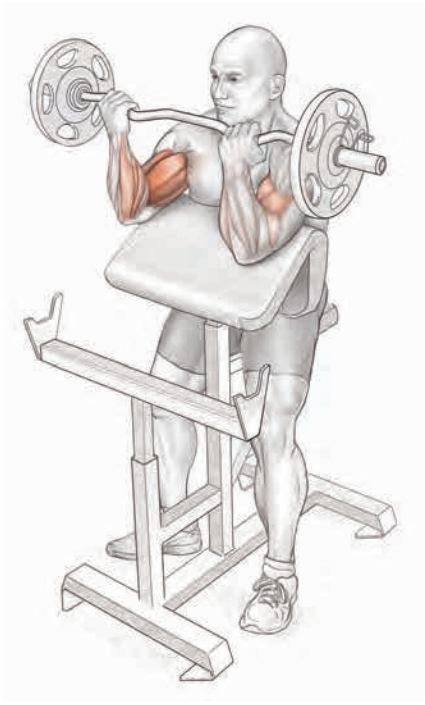
Range of motion: Resting the upper arms on the bench prevents movement at the shoulders and thereby helps isolate the biceps brachii. Stopping a few degrees short of full elbow extension keeps tension on the biceps brachii as the barbell is lowered.

Body position: Adjust the seat height so that your armpit is snug against the upper edge of the pad.

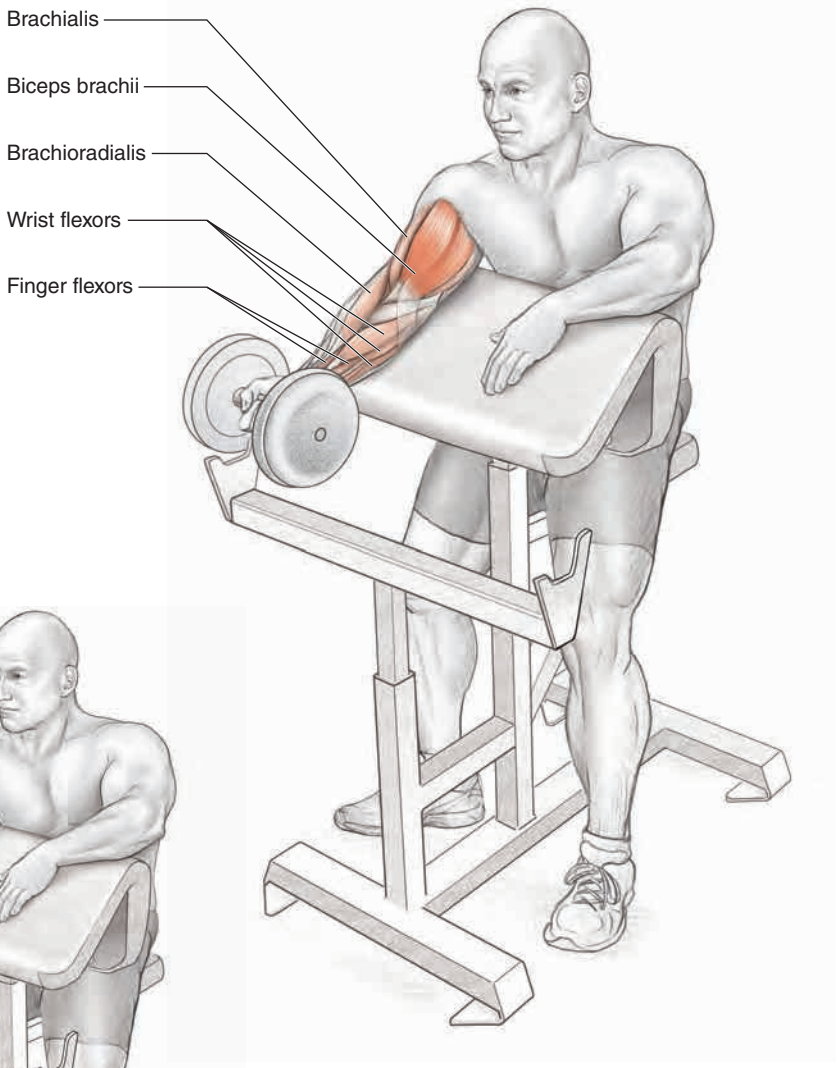
VARIATION

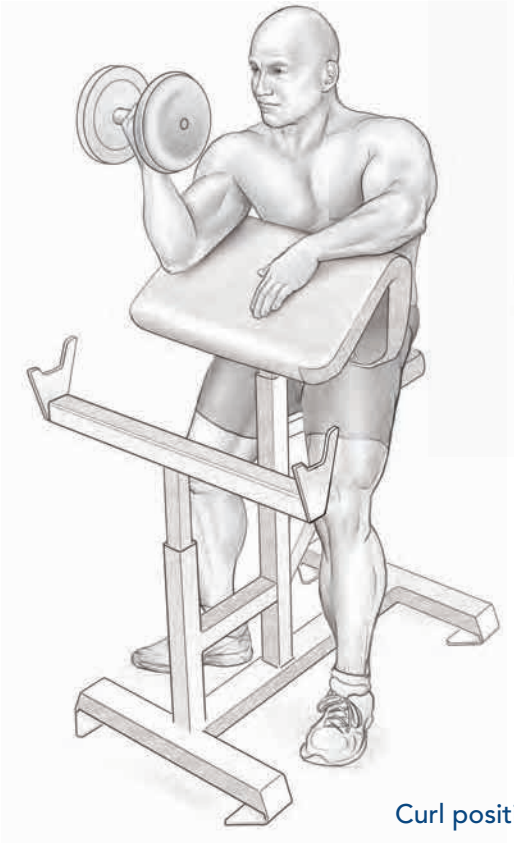
EZ-Bar Preacher Curl

Using an EZ bar, the grip switches from the fully supinated (palms facing up) position to a less supinated, nearly neutral (palms facing in) grip. This hand position tends to focus effort on the outer (long) head of the biceps brachii and the brachialis muscle and is less strenuous on the wrist joints.



DUMBBELL PREACHER CURL





Curl position.

Execution

1. Sitting with your upper arm resting on a preacher bench, hold a dumbbell in one hand at arm's length.
2. Curl the dumbbell up toward your shoulder by bending at the elbow.
3. Lower the dumbbell back down to the starting position.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Resistance: Performing the exercise one arm at a time with a dumbbell improves focus and isolation.

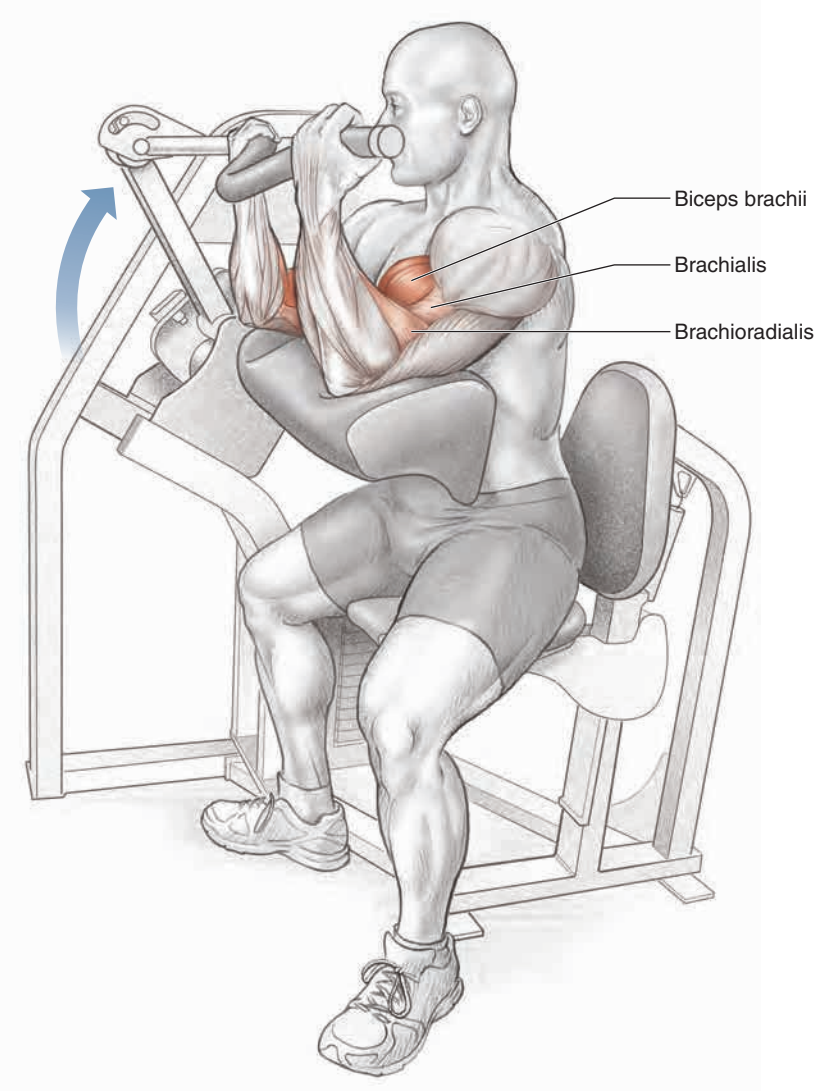
Grip: An underhand (palm facing up) grip places the hand in supination and thereby maximizes contraction of the biceps brachii.

Trajectory: When the upper arm is supported at an inclined angle, resistance is maximal at the start, so effort is targeted on the lower section of the biceps brachii near the elbow.

Range of motion: Resting the upper arm on the bench prevents movement at the shoulder and thereby helps isolate the biceps brachii. Stopping a few degrees short of full elbow extension keeps tension on the biceps brachii as the weight is lowered.

Body position: Adjust the seat height so that your armpit is snug against the upper edge of the pad.

MACHINE CURL



Execution

1. Grasp the bar using a shoulder-width underhand grip, with your elbows resting on the pad and your arms out straight.
2. Curl the bar toward your shoulders by bending at the elbow.
3. Return the bar to the starting position.

Muscles Involved

Primary: Biceps brachii

Secondary: Brachialis, brachioradialis, forearm muscles (wrist flexors, finger flexors)

Anatomic Focus

Hand spacing: A wide grip focuses effort on the inner biceps brachii (short head), whereas a narrow grip works the outer biceps brachii (long head).

Grip: An angled handlebar is less strenuous on the wrist joints than a straight bar.

Trajectory: An incline arm pad focuses effort on the lower portion of the biceps brachii.

Range of motion: Effort is focused on the lower biceps brachii during the initial phase of the curl, then switches to the middle biceps brachii (peak) as the weight is raised.

Resistance: Unlike barbell or dumbbell curls, in which the resistance varies during the lift, the machine provides uniform resistance throughout the movement.

VARIATIONS

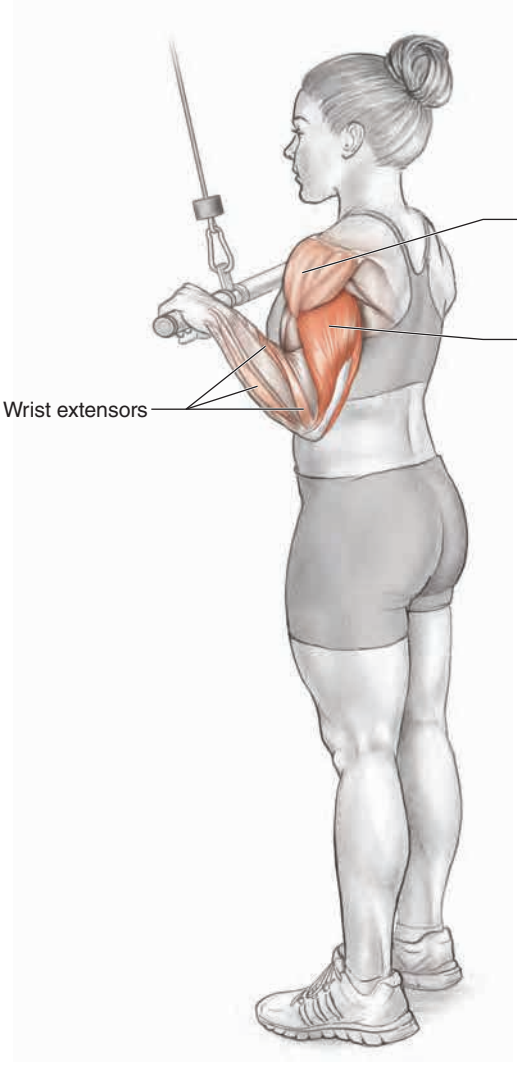
Machine Flat-Pad Curl

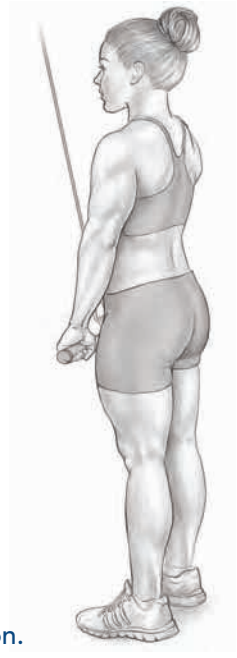
In contrast to the trajectory of an incline arm pad, the trajectory of a flat, horizontal arm pad focuses effort on the peak of the biceps brachii.

One-Arm Machine Curl

Performing this exercise with one arm at a time improves focus and isolation.

TRICEPS PUSH-DOWN





End position.

Execution

1. Facing the weight stack, take a shoulder-width overhand grip on a short bar attached to the high pulley.
2. Begin with the bar at chest level, with your elbows bent a little more than 90 degrees.
3. Keeping your upper arms stiff, push the bar down until your elbows lock out.

Muscles Involved

Primary: Triceps brachii

Secondary: Deltoid, forearm muscles (wrist extensors)

Anatomic Focus

Hand spacing: A wide grip focuses effort on the inner triceps brachii (long head), whereas a narrow grip focuses effort on the outer triceps brachii (lateral head).

Grip: Using the straight bar, a pronated (palms down) grip emphasizes the outer lateral head of the triceps brachii, whereas a supinated (palms up) grip focuses effort on the inner long head. A V-shaped bar switches the hands into a neutral (thumbs up) grip that equally targets all three heads of the triceps brachii.

Trajectory: When the upper arms are perpendicular to the floor, the outer triceps brachii (lateral head) contributes to the movement. If you perform the exercise with your arms raised parallel to the floor, effort is focused on the inner triceps brachii (long head).

Range of motion: Fixing the upper arms against your sides prevents movement at the shoulders and is an excellent way to isolate the triceps brachii. Motion should occur through the elbow only.

Resistance: Unlike barbell or dumbbell exercises, in which the resistance varies during the lift, the cable provides a uniform resistance throughout the movement.

Body position: Standing upright with the spine straight is the standard position. Leaning the torso slightly forward at the waist provides better stability when using heavier weights.

VARIATIONS

Rope Push-Down

The rope attachment affords a forcible pronation at the wrist, which targets the outer lateral head of the triceps brachii.

Reverse-Grip Push-Down

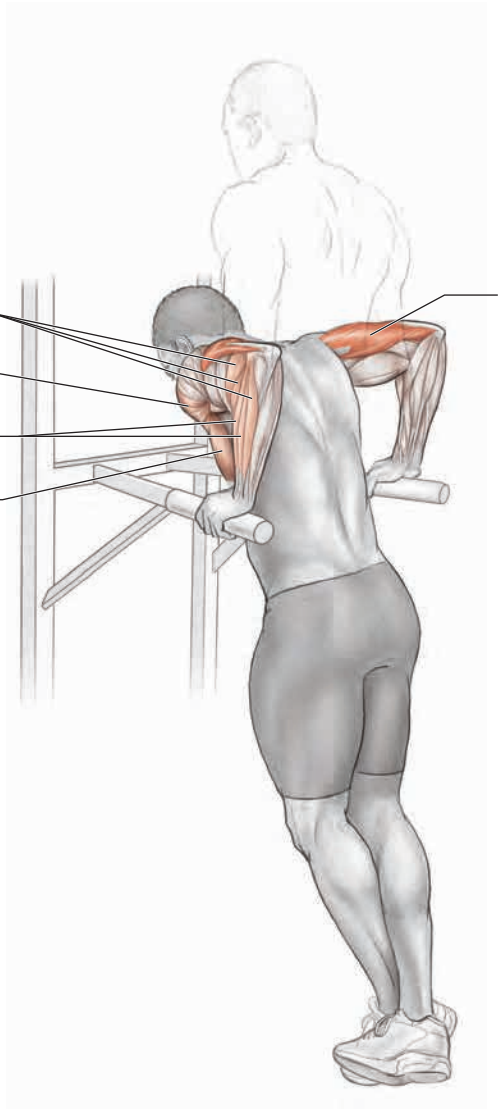
A reverse (underhand) grip focuses effort on the inner long head of the triceps brachii.

One-Arm Push-Down

Performing this exercise with one arm at a time while holding a D-handle, using either an overhand or underhand grip, focuses effort and improves isolation.



DIP



Execution

1. Grasp the parallel bars and lift yourself until your arms are fully extended.
2. Bend your elbows and slowly lower your body until your upper arms are approximately parallel to the floor. Keep your torso upright.
3. Push yourself back up, straightening your arms until your elbows lock out.

Muscles Involved

Primary: Triceps brachii

Secondary: Pectoralis major, anterior deltoid, forearm muscles (wrist extensors, finger extensors)

Anatomic Focus

Hand spacing: A wide grip focuses effort on the inner triceps brachii (long head), whereas a narrow grip focuses effort on the outer triceps brachii (lateral head).

Grip: The standard grip (palms facing each other and thumbs forward) hits all three heads of the triceps brachii and emphasizes the inner long head. Reversing the grip so that the palms face outward and the thumbs point back switches most of the effort to the outer triceps brachii (long head).

Trajectory: Keeping your elbows close to your sides helps isolate the triceps brachii. Flaring your elbows out wide allows the chest muscles to assist.

Range of motion: To isolate the triceps brachii, keep motion at the shoulders to a minimum. Movement should occur primarily at the elbows.

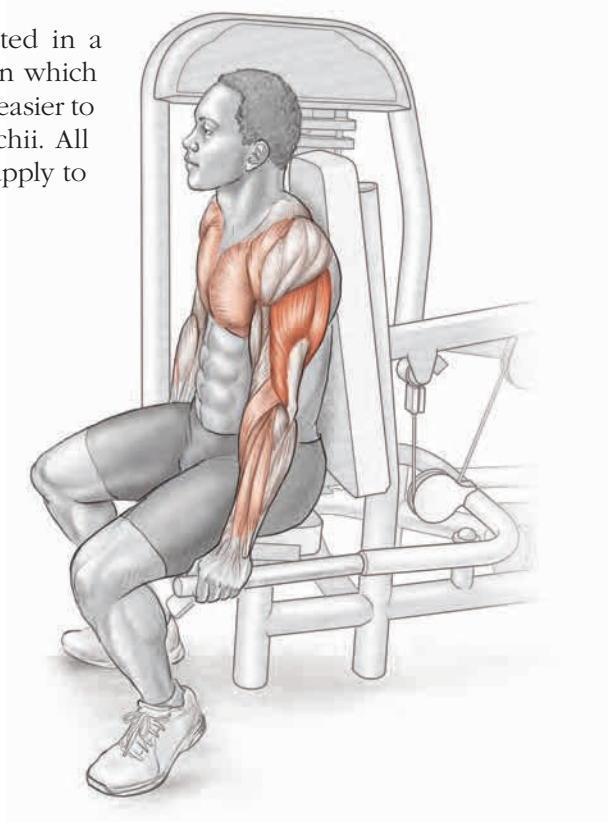
Body position: To focus effort on the triceps brachii, keep your body upright. Leaning forward makes the chest muscles do more work.

Resistance: Resistance is provided by your body weight and is not easily adjusted. You can add resistance by attaching a weighted belt around your hips.

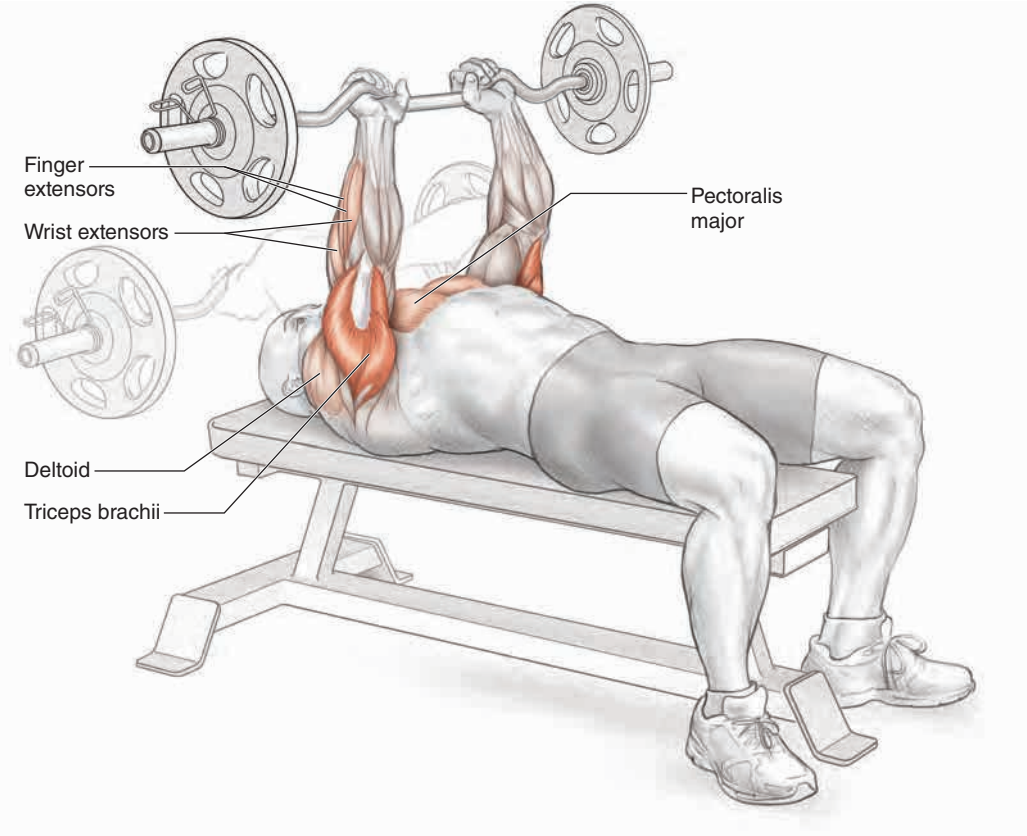
VARIATION

Machine Dip

Performing this exercise while seated in a triceps push-down (dip) machine, on which the resistance is adjustable, makes it easier to focus your effort on the triceps brachii. All the tips mentioned for the dip also apply to the machine variation.



LYING TRICEPS EXTENSION



Execution

1. Lying on a flat bench, hold a barbell or EZ bar at arms' length above your chest with an overhand grip, hands spaced approximately 6 inches (15 cm) apart.
2. Bend at the elbows and lower the bar until it touches your forehead.
3. Push the bar upward until your elbows lock out.

Muscles Involved

Primary: Triceps brachii

Secondary: Pectoralis major, deltoid, forearm muscles (wrist extensors, finger extensors)

Anatomic Focus

Hand spacing: A wide grip emphasizes the inner triceps brachii (long head), whereas a narrow grip targets the outer triceps brachii (lateral head). Keep the elbows close and do not allow them to flare out to the sides.

Grip: Using a straight bar, you may perform this exercise with an overhand (pronated) grip or an underhand (supinated) grip. Using an EZ bar or dumbbells (see variation) requires a neutral grip. An overhand grip works the inner (long) head of the triceps brachii, an underhand grip emphasizes the outer (lateral) head, and a neutral grip works all three heads.

Trajectory: The vertical position of the arm stretches the inner (long) head of the triceps brachii, so this exercise targets this section of the muscle. Lowering the bar beyond the forehead toward the bench generates a greater stretch in the long head, favoring its contraction during the movement.

Body position: Keep your elbows pointing up and upper arms vertical. Do not lower the bar toward your face or chin; this causes the elbows to drop and allows the deltoid and pectoral muscles to assist in the movement.

Range of motion: To isolate the triceps brachii, motion should occur only at the elbows, not at the shoulders.

VARIATIONS

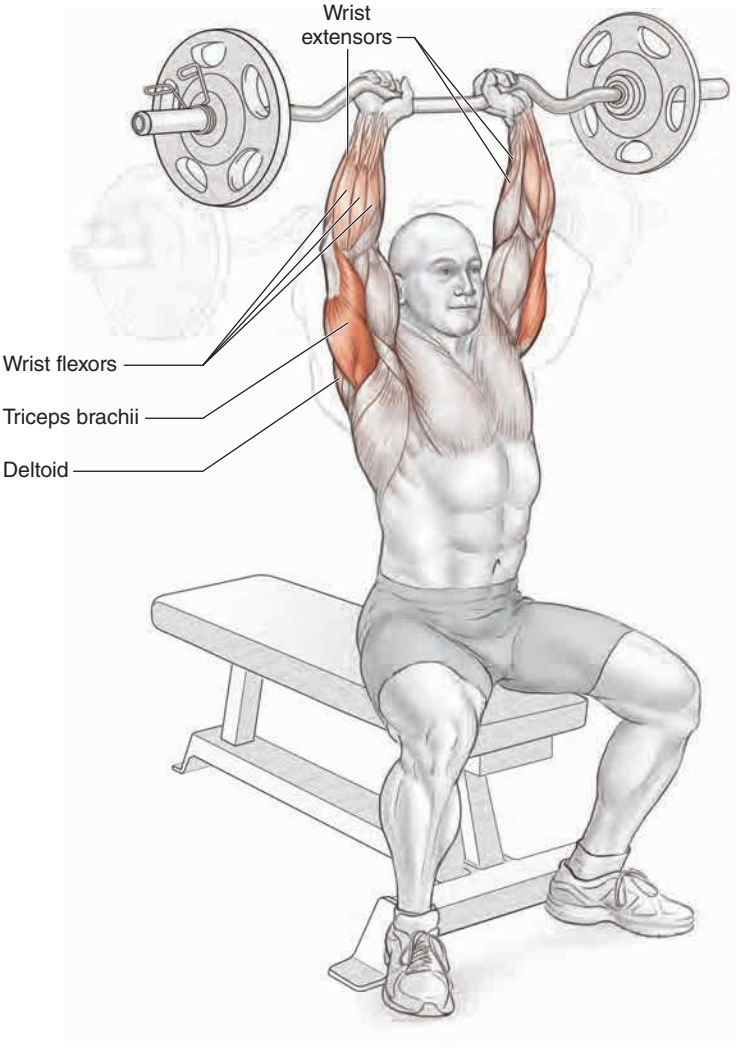
Dumbbell Lying Triceps Extension

Perform this exercise with a dumbbell in each hand, moving both arms simultaneously. Your thumbs should point toward your face (neutral grip).

Reverse Grip Lying Triceps Extension

Perform this exercise using a reverse (supinated) grip on the bar to emphasize the outer (lateral) head of the triceps brachii.

BARBELL SEATED TRICEPS PRESS



Execution

1. Sitting upright, hold a barbell at arms' length above your head using a narrow overhand grip.
2. Bend at the elbows and lower the bar behind your head.
3. Push the bar upward until your elbows lock out.

Muscles Involved

Primary: Triceps brachii

Secondary: Deltoid, forearm muscles (wrist flexors, wrist extensors)

Anatomic Focus

Hand spacing: A wide grip emphasizes the inner triceps brachii (long head), whereas a narrow grip targets the outer triceps brachii (lateral head). Keep the elbows close together and do not allow them to flare outward.

Grip: Using a straight bar, this exercise requires an overhand (pronated) grip. Using an EZ bar (see variation), this exercise requires a neutral grip. An overhand grip works the inner (long) head of the triceps brachii, whereas a neutral grip works all three heads.

Trajectory: The vertical position of the arm stretches the inner long head of the triceps brachii, so this exercise preferentially targets this section of the muscle.

Range of motion: To isolate the triceps brachii, motion should occur at the elbows only.

Safety tip: This exercise poses two safety concerns: It places excessive stretch on the triceps tendon, and it places the shoulder joint in a position that makes the joint vulnerable to injury. Therefore, this exercise is not the best choice for people who have elbow or shoulder pain.

VARIATION

EZ-Bar Triceps Press

Performing this movement with an EZ bar offers a variety of grip choices.

DUMBBELL SEATED TRICEPS PRESS



Execution

1. Sitting upright, hold a dumbbell in both hands at arms' length above your head, placing your fingers around the dumbbell weight.
2. Bend at the elbows and lower the weight behind your head.
3. Push the dumbbell upward until your elbows lock out.

Muscles Involved

Primary: Triceps brachii

Secondary: Deltoid, forearm (wrist flexors, wrist extensors)

Anatomic Focus

Grip: The dumbbell is held in a vertical position. Your fingers can be interlocked around the handle (neutral grip) or around the uppermost dumbbell plate (pronated grip). A neutral grip works all three heads of the triceps brachii, whereas a pronated grip targets the inner (long) head.

Hand spacing: The narrow grip on the dumbbell requires that the elbows flare outward during the movement.

Trajectory: The vertical position of the arm stretches the inner long head of the triceps brachii, facilitating its involvement in the exercise.

Range of motion: In order to isolate the triceps brachii, motion should occur only at the elbow joints. The upper arms should remain vertical.

Safety tip: Any overhead triceps-extension exercise places the shoulder joint in a position that makes it vulnerable to injury. Therefore, this exercise may not be the best choice for people with shoulder pain.

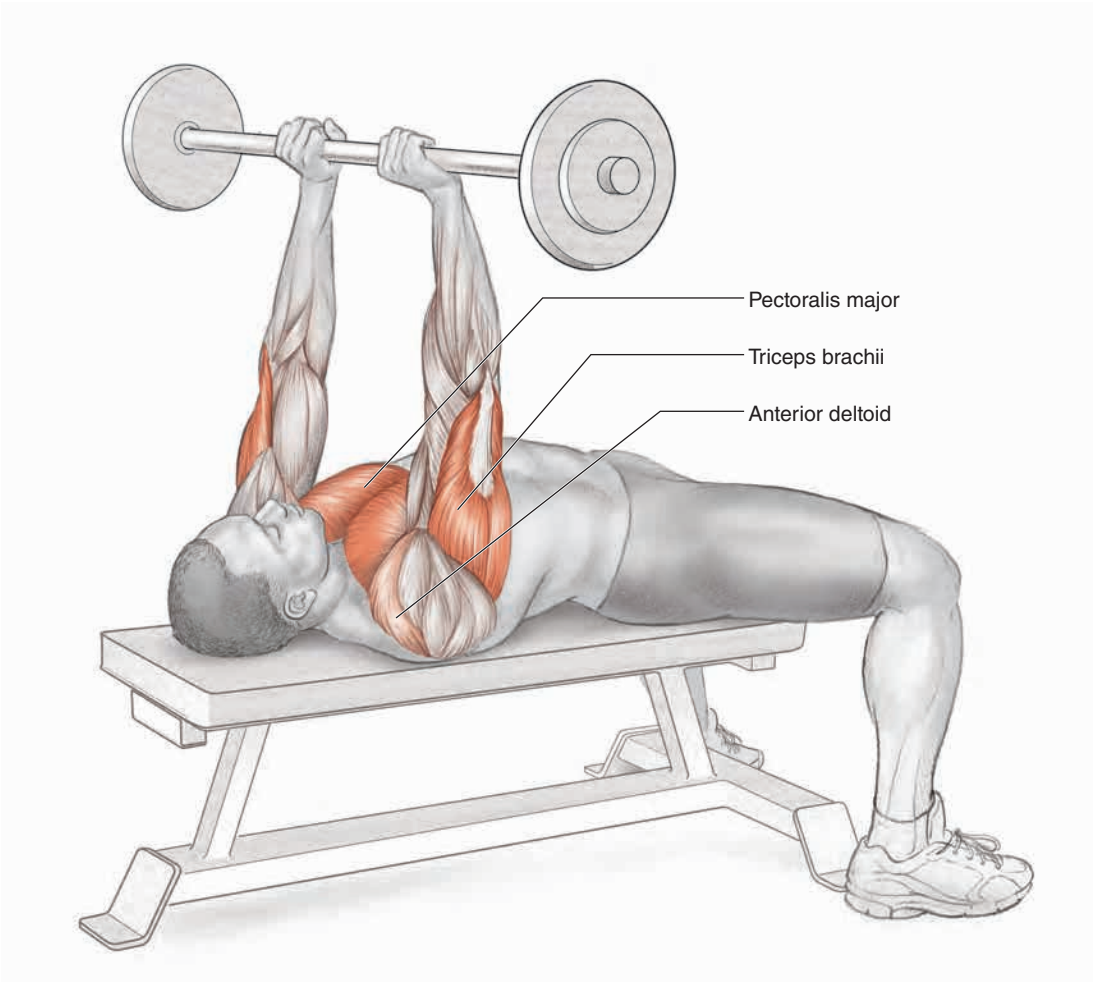
VARIATION

One-Arm Seated Triceps Press

To emphasize the outer (lateral) head of the triceps brachii, perform this exercise with one arm at a time while holding a dumbbell with the palm facing forward.



CLOSE-GRIP BENCH PRESS



Execution

1. Lie on a flat exercise bench. Take a 6-inch (15 cm) overhand grip on the bar.
2. Lower the weight slowly until it touches the middle chest.
3. Push the bar straight up until your elbows lock out.

Muscles Involved

Primary: Triceps brachii, pectoralis major

Secondary: Anterior deltoid

Anatomic Focus

Hand spacing: To target the triceps brachii, hand spacing should be narrower than shoulder width.

Grip: An underhand (supinated) grip on the bar also targets the triceps brachii, but this grip requires the hands to be spaced wide apart (see variation).

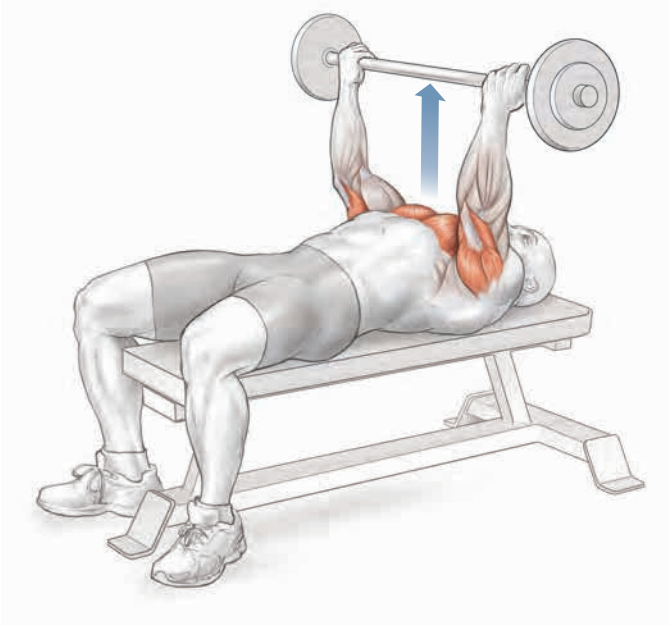
Trajectory: Keep your elbows close to your sides to emphasize the triceps brachii, not the chest.

Range of motion: A full range of motion (achieving full lockout) is required for maximizing triceps brachii effort.

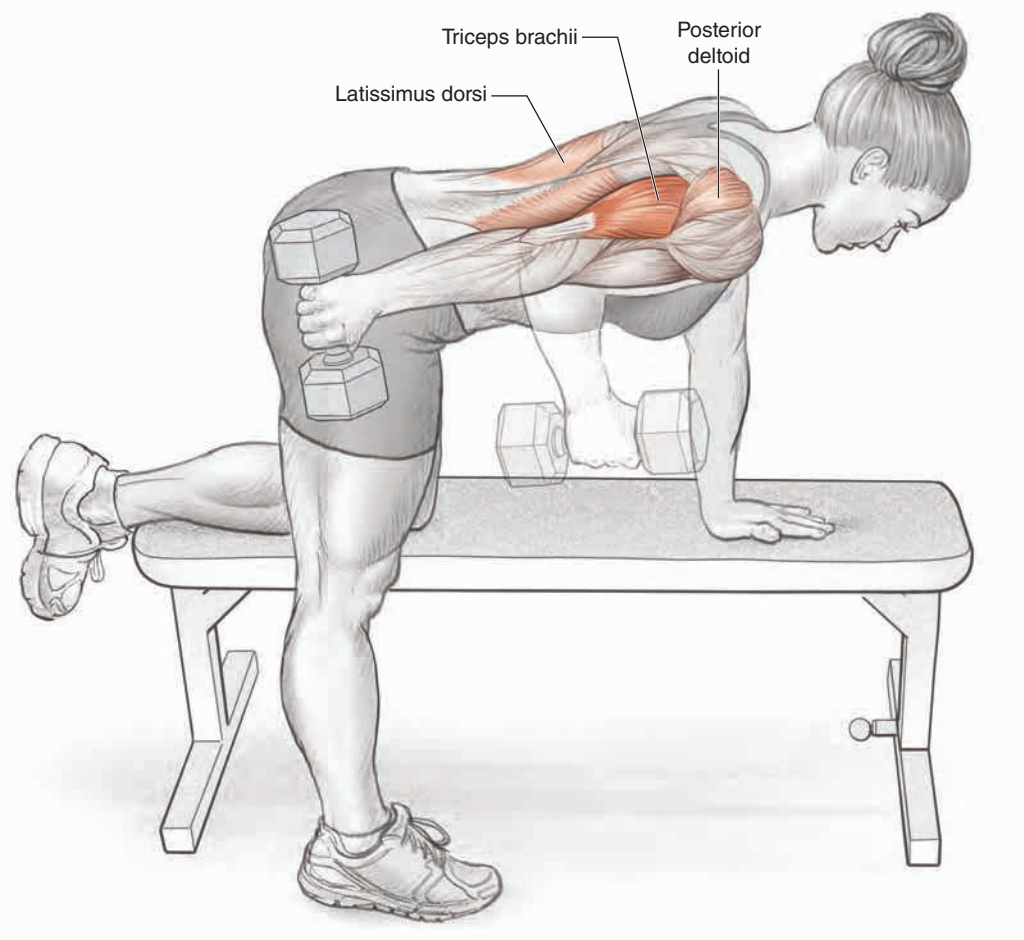
VARIATION

Reverse-Grip Bench Press

Performing this exercise using an underhand (palms facing up) grip with your hands spaced more than shoulder-width apart also targets the triceps brachii.



DUMBBELL KICKBACK



Execution

1. Holding a dumbbell in one hand, bend forward at the waist and support your torso by resting your free hand on a bench or on your knee.
2. Begin with your upper arm parallel to the floor and your elbow bent 90 degrees.
3. Raise the dumbbell upward, straightening your arm until your elbow locks out.

Muscles Involved

Primary: Triceps brachii

Secondary: Posterior deltoid, latissimus dorsi

Anatomic Focus

Grip: A neutral (thumb forward) grip works all sections of the triceps brachii. Rotating the dumbbell so your palm faces up targets the outer (lateral) head.

Trajectory: Keep your upper arm parallel to the floor and your elbow close to your side.

Range of motion: To isolate the triceps brachii, the shoulder should remain stiff. Movement should occur at the elbow.

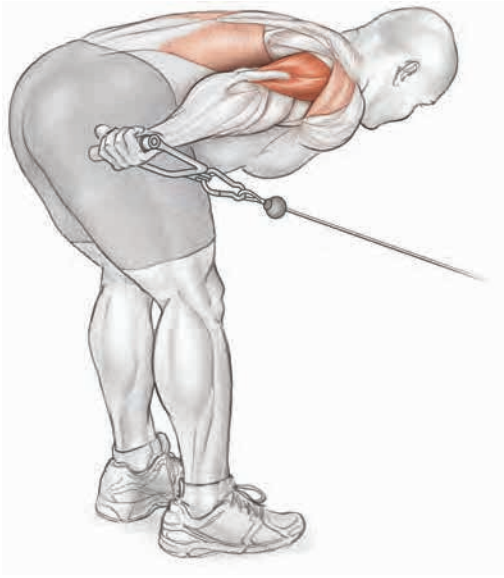
Resistance: Because of the effect of gravity, resistance is variable and increases as the dumbbell is raised upward.

Body position: Your torso should be slightly above parallel to the floor. If you stand too upright, you can't perform the exercise effectively.

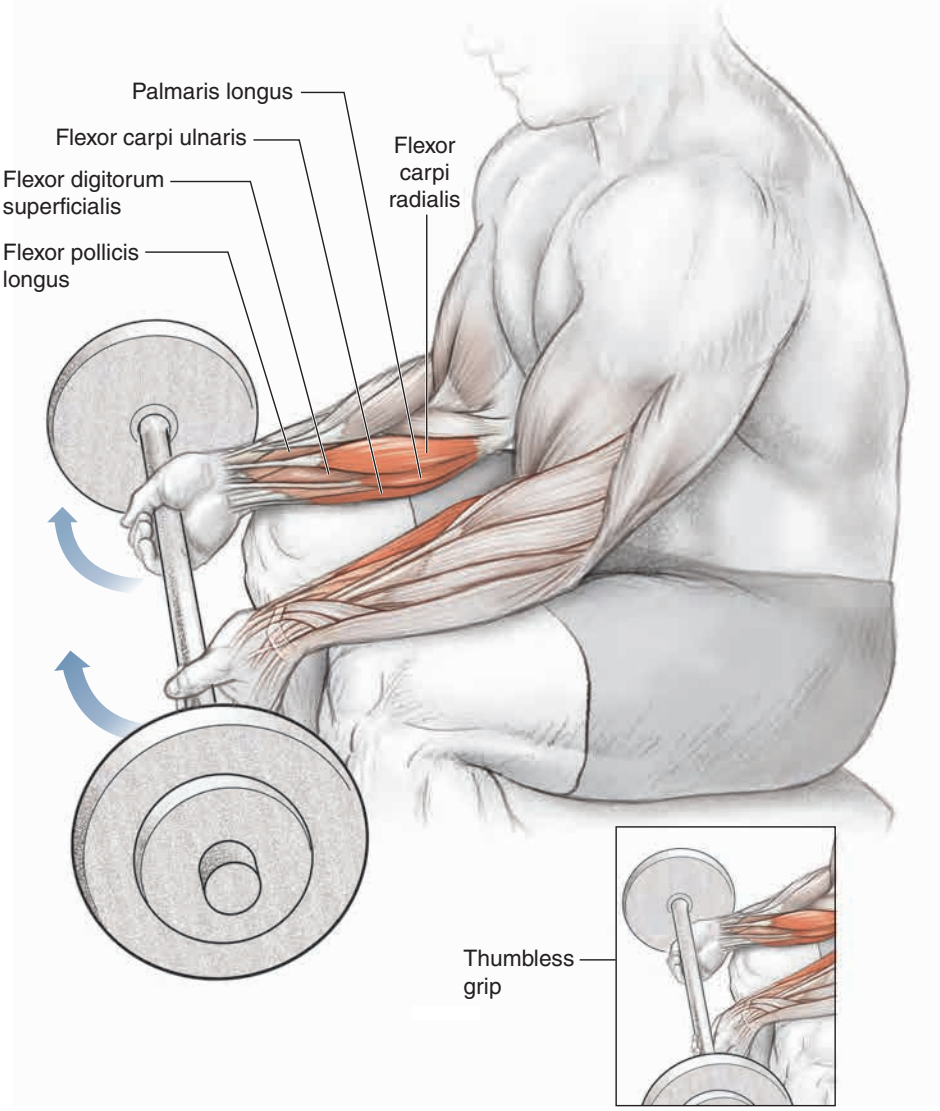
VARIATION

Cable Kickback

Perform this exercise while using a D-handle attached to a low pulley. Unlike the dumbbell kickback, in which the resistance varies during the lift, the cable provides uniform resistance throughout the movement.



WRIST CURL



Execution

1. Sitting on the edge of a bench, grasp a barbell with a shoulder-width underhand grip and rest the backs of your forearms on your thighs.
2. Lower the bar by bending your wrists toward the floor.
3. Curl the weight up by using wrist flexion.

Muscles Involved

Primary: Palmaris longus, flexor carpi radialis, flexor carpi ulnaris

Secondary: Flexor digitorum superficialis, flexor digitorum profundus, flexor pollicis longus

Anatomic Focus

Hand spacing: The ideal hand spacing is shoulder width or slightly narrower. Your hands should be directly in line with your forearms to minimize unnecessary stress in your wrist joints.

Grip: This exercise requires a supinated (palms facing up) grip. You may place your thumbs either under or over the bar, depending on personal preference. One advantage of a thumbless (thumbs under the bar) grip is that it allows you to lower the bar farther, increasing the range of motion.

Range of motion: Letting the bar roll down your fingers during the lowering phase of the repetition increases the range of motion. A thumbless grip allows this action. As the bar is curled up, the finger flexors work as you finger-curl the bar into your palm, and then the forearm flexors work as you curl your wrist up. Because the finger flexors make up a significant portion of the forearm muscles, this extended repetition is more effective for building forearm mass.

Trajectory: Changing the position of your forearms in relation to the floor alters the resistance and adjusts the focus of the exercise. When your forearms are flat and parallel to the floor, resistance is maximal at the beginning and decreases as the bar is lifted up. When your forearms are angled to the floor so that your elbows are higher than your wrists, resistance is minimal at the start and increases as the bar is curled up. This trajectory is more effective at maximizing forearm contraction.

Body position: You may support your forearms in several ways: between your legs on a flat bench, on top of your thighs while seated on a bench, or on the incline pad of a preacher bench.

VARIATIONS

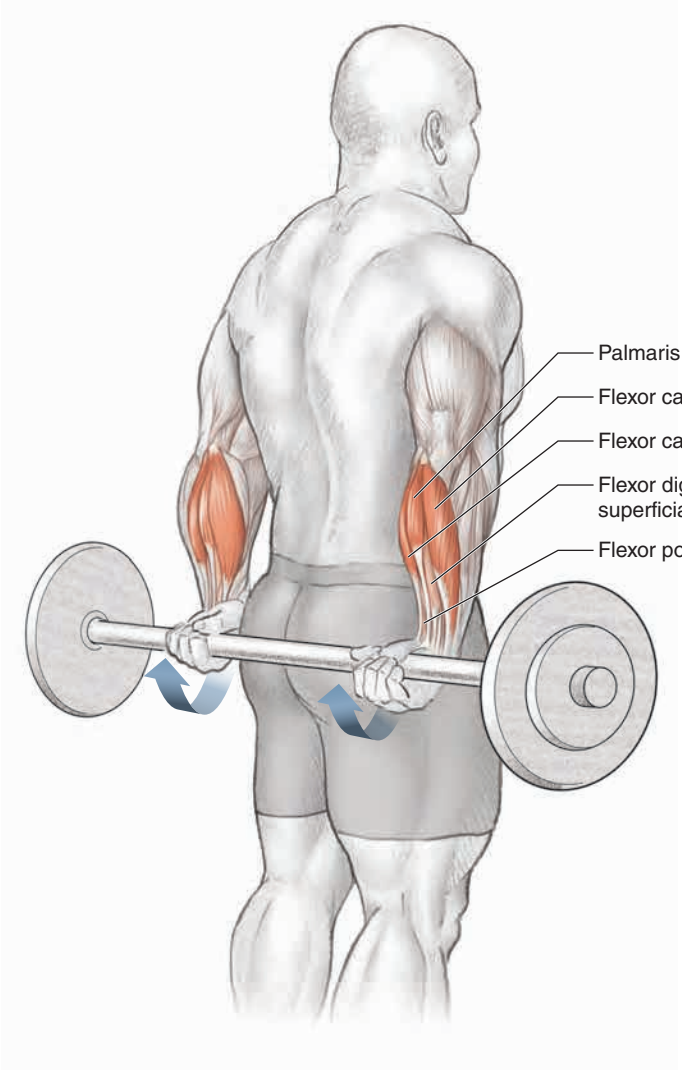
Dumbbell Wrist Curl

Perform this exercise with one arm at a time while holding a dumbbell.

Preacher Bench Wrist Curl

Perform this exercise with your forearms resting on the incline pad of a preacher bench.

BARBELL STANDING REAR WRIST CURL



Execution

1. Standing upright, grasp a barbell at arms' length behind your hips using a shoulder-width overhand grip.
2. Curl the bar by bending your wrists upward and backward.
3. Lower the weight toward the floor using wrist extension.

Muscles Involved

Primary: Palmaris longus, flexor carpi radialis, flexor carpi ulnaris

Secondary: Flexor digitorum superficialis, flexor digitorum profundus, flexor pollicis longus

Anatomic Focus

Hand spacing: The ideal hand spacing is shoulder width or slightly wider. Your hands should be directly in line with your forearms to minimize unnecessary stress in the wrist joints.

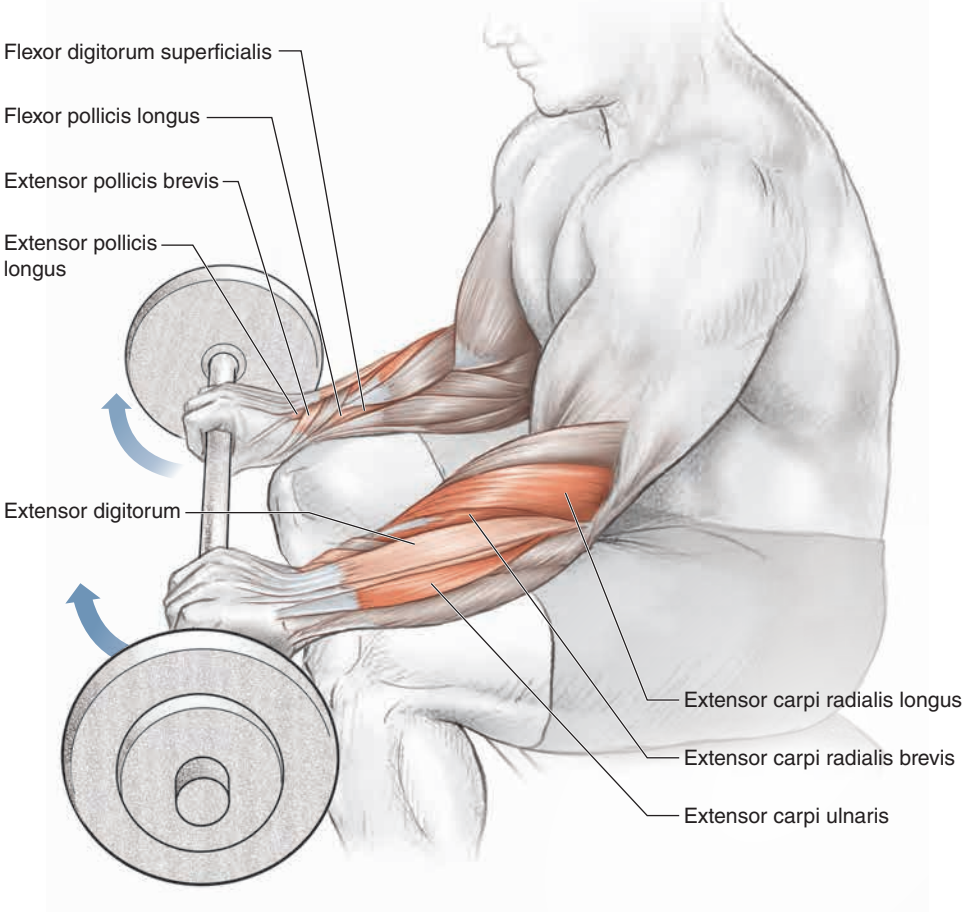
Grip: This exercise requires a pronated (overhand; palms facing backward) grip. You may place your thumbs either under or over the bar, depending on personal preference. One advantage of a thumbless (thumbs under the bar) grip is that it allows you to lower the bar farther, increasing the range of motion.

Range of motion: Letting the bar roll down your fingers during the lowering phase of the repetition increases the range of motion. A thumbless grip allows this action. As the bar is curled upward, the finger flexors work as you finger-curl the bar into your palm, and then the forearm flexors work as you curl your wrist up. Because the finger flexors make up a significant portion of the forearm muscles, this extended repetition is more effective for building forearm mass.

Trajectory: Because your forearms are vertical to the floor, resistance is minimal at the start and increases as you curl the bar up. The elbows are held straight during this exercise, which affords a greater muscle stretch than does performing wrist curls with the elbows bent.

Body position: Slightly bending your knees eases the passage of the bar behind the thighs.

REVERSE WRIST CURL



Execution

1. Grasp a barbell using an overhand grip and rest your forearms on the tops of your thighs or on the edge of a bench.
2. Lower the bar by bending your wrists toward the floor.
3. Raise the weight using wrist extension.

Muscles Involved

Primary: Extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris

Secondary: Extensor digitorum, extensor pollicis longus, extensor pollicis brevis, extensor indicis, flexor digitorum superficialis, flexor digitorum profundus, flexor pollicis longus

Anatomic Focus

Hand spacing: The ideal hand spacing is shoulder width or narrower. Your hands should be directly in line with your forearms.

Grip: This exercise requires a pronated (palms facing down) grip with your thumbs around the bar.

Trajectory: Changing the position of your forearms in relation to the floor alters the resistance and adjusts the focus of the exercise. When your forearms are flat and parallel to the floor, resistance is maximal at the beginning and decreases as the bar is lifted up. When your forearms are angled to the floor so that your elbows are higher than your wrists, resistance is minimal at the start and increases as the bar is curled up. This trajectory is more effective at maximizing forearm contraction.

Range of motion: Use a full range of motion to maximize forearm effort.

Body position: You may support your forearms in several ways: between your legs on a flat bench, on the tops of your thighs as you are seated on a bench, on the incline pad of a preacher bench, or held parallel to the floor (unsupported) in the standing curl position.

VARIATIONS

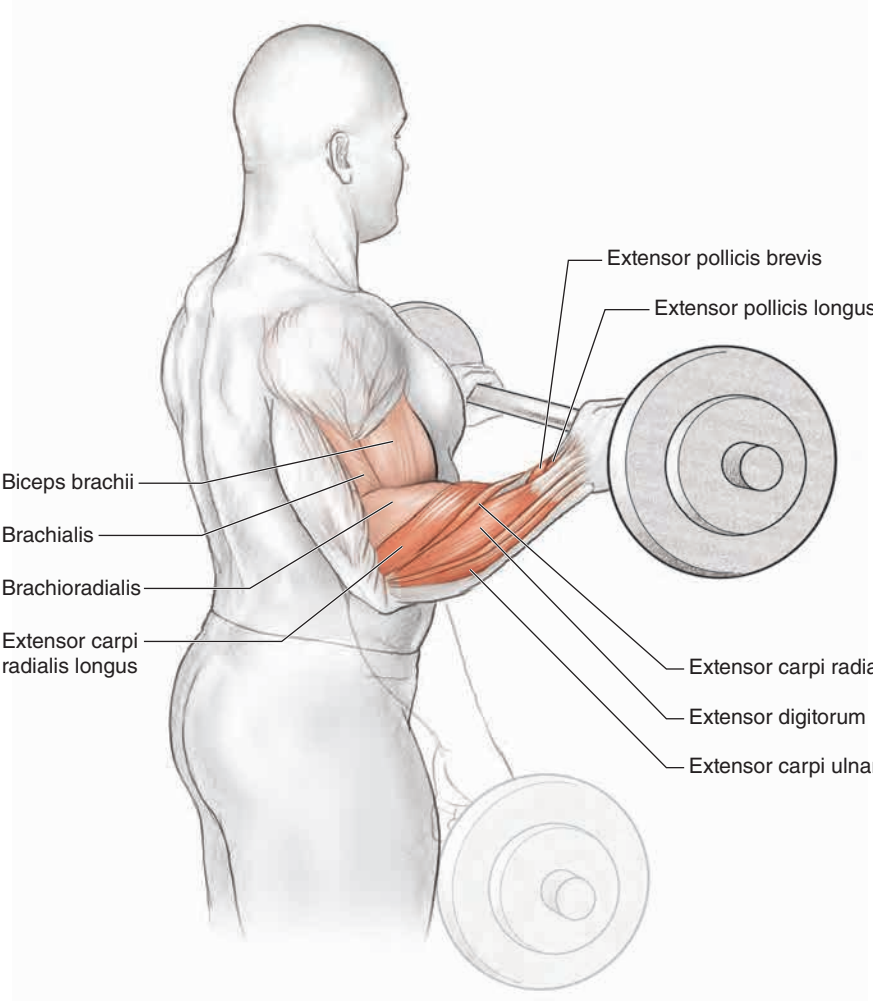
Dumbbell Reverse Wrist Curl

Perform this exercise with one arm at a time while holding a dumbbell.

Preacher Bench Reverse Wrist Curl

Perform this exercise with your forearms resting on the incline pad of a preacher bench.

BARBELL REVERSE CURL



Execution

1. Hold a barbell at arms' length using a shoulder-width overhand grip.
2. Raise the bar toward shoulder level, curling your wrists up and back as you bend your elbows.
3. Lower the bar back down to the starting position while flexing the wrists.

Muscles Involved

Primary: Extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris, extensor digitorum, extensor pollicis longus, extensor pollicis brevis, extensor indicis

Secondary: Biceps brachii, brachioradialis, brachialis

Anatomic Focus

Hand spacing: The ideal hand spacing is shoulder width with your hands directly in line with your forearms.

Grip: This exercise requires a pronated (palms facing down) grip with your thumbs around the bar.

Range of motion: To maximize forearm involvement, be sure to achieve a full range of motion at the wrists. Cock the wrists back into full extension as you raise the bar, and flex the wrists down as you lower the weight.

Resistance: Because of gravity, resistance increases as the bar is raised up. To ensure maximum forearm effort, delay the wrist-extension curl until your forearms are parallel to the floor.

VARIATIONS

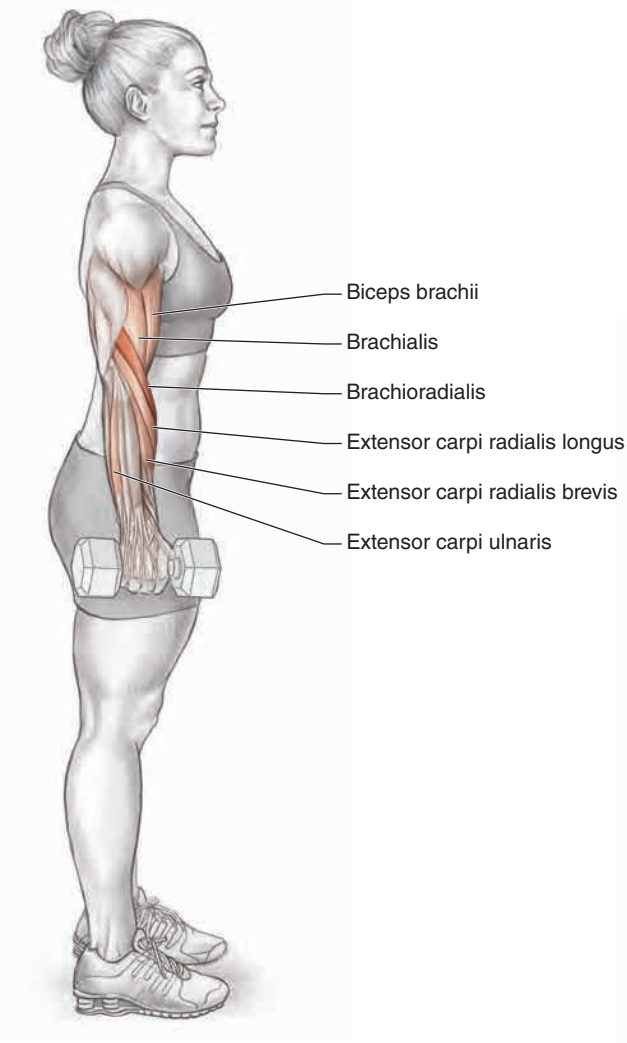
Dumbbell Reverse Curl

Perform this exercise with one arm at a time while holding a dumbbell in each hand with a pronated (overhand) grip.

Wrist Roller

With a strong rope, attach a small weight plate to the center of a short broomstick. Holding the broomstick out in front of you in an overhand grip, raise the weight by wrist-curling the rope around the stick, alternating hand to hand.

HAMMER CURL





End position.

Execution

1. Hold a dumbbell in each hand with your palms facing inward and thumbs pointing forward.
2. Curl one dumbbell up toward your shoulder, keeping your palms facing inward.
3. Lower the dumbbell back down to the starting position and repeat with the opposite arm.

Muscles Involved

Primary: Brachioradialis

Secondary: Brachialis, extensor carpi radialis longus, extensor carpi radialis brevis, extensor carpi ulnaris, palmaris longus, flexor carpi radialis, flexor carpi ulnaris, biceps brachii

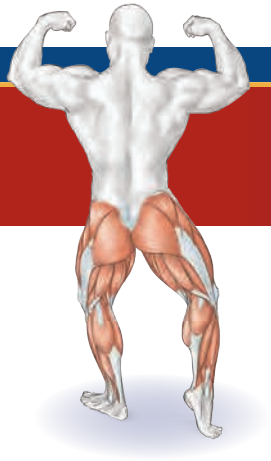
Anatomic Focus

Grip: This exercise requires a neutral (palms facing inward) grip with the thumbs around the dumbbell handle.

Range of motion: To maximize forearm effort, work your wrist in the vertical plane, cocking your thumb upward as you raise the dumbbell.

Trajectory: To focus effort on the brachioradialis, raise the dumbbell across the front of your body rather than at your side.

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chapter 5

LEGS

The leg is divided into the upper leg (thigh) and lower leg (calf) (figure 5.1). The upper leg consists of one bone, the femur, whereas the lower leg consists of two bones, the tibia (located on the big-toe side) and the fibula (located on the little-toe side).

The knee is a hinge joint formed at the junction between the femur and the tibia. Two movements occur at the knee joint: flexion and extension. During knee flexion, the lower leg bends toward the back of the thigh. During knee extension, the lower leg moves away from the thigh so the leg becomes straight.

The hip is a ball-and-socket joint between the upper end of the femur and the pelvic bone. Six main movements occur at the hip joint: flexion, extension, abduction, adduction, internal rotation, and external rotation. During hip flexion the thigh bends up toward the abdomen, whereas during hip extension the thigh moves backward toward the buttocks. The thighs separate during hip abduction and come together during hip adduction.

The ankle is a hinge-type joint between the lower tibia and fibula and the talus bone in the foot. During ankle dorsiflexion, the toes lift off the floor and the foot moves toward the shin. During ankle plantar flexion, the heel lifts off the floor and the foot moves away from the shin.

QUADRICEPS

The quadriceps femoris, located in front of the thigh, has four separate heads:

1. The rectus femoris arises from the front of the pelvic bone.
2. The vastus medialis arises from the inner edge of the femur.
3. The vastus lateralis arises from the outer edge of the femur.
4. The vastus intermedius arises from the front surface of the femur and lies underneath the rectus femoris.

The four heads merge together, attach onto the patella (knee cap), and then insert via a single patellar tendon onto the tibia, just below the knee joint. The main function of the quadriceps is to extend the knee and straighten the leg. Because the rectus femoris arises from the pelvic bone, contraction of this muscle also flexes the hip joint.

HAMSTRINGS

The hamstrings, located behind the thigh, is a group of three muscles that originate from the ischium bone of the pelvis. The biceps femoris passes behind the outer aspect of the thigh to attach to the head of the fibula bone, just below the knee.

The semimembranosus passes behind the inner aspect of the thigh, attaching to the upper tibia bone behind the knee. The semitendinosus passes behind the inner aspect of the thigh, attaching to the upper tibia bone adjacent to the semimembranosus. All three hamstrings muscles span both the knee and hip joints. Therefore, they serve dual functions: flexion of the knee and extension of the hip.

GLUTEALS

The gluteus maximus arises from a large area on the rear of the pelvic bone, passes down behind the hip joint, and attaches to the upper femur. This powerful muscle causes hip extension. Exercises that are good for building the gluteal muscles are the squat, deadlift, and lunge.

Other muscles that move the hip joint include the following:

- Hip adductors (inner thigh): gracilis, adductor longus, adductor magnus, and adductor brevis
- Hip abductors: tensor fasciae latae, gluteus medius, and gluteus minimus
- Hip flexors: sartorius, iliopsoas, and rectus femoris
- Hip extensor: gluteus maximus

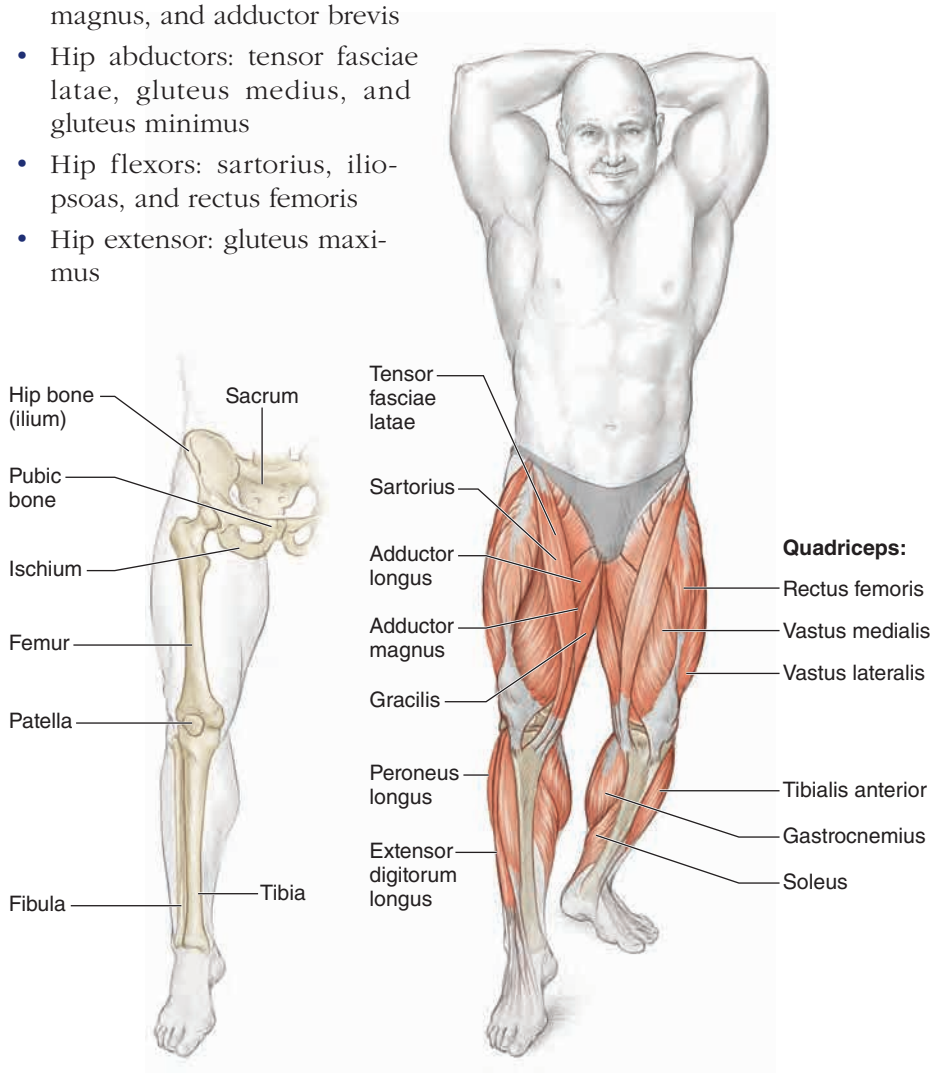


Figure 5.1 Showcasing the legs: *(a)* front view; *(b)* back view.

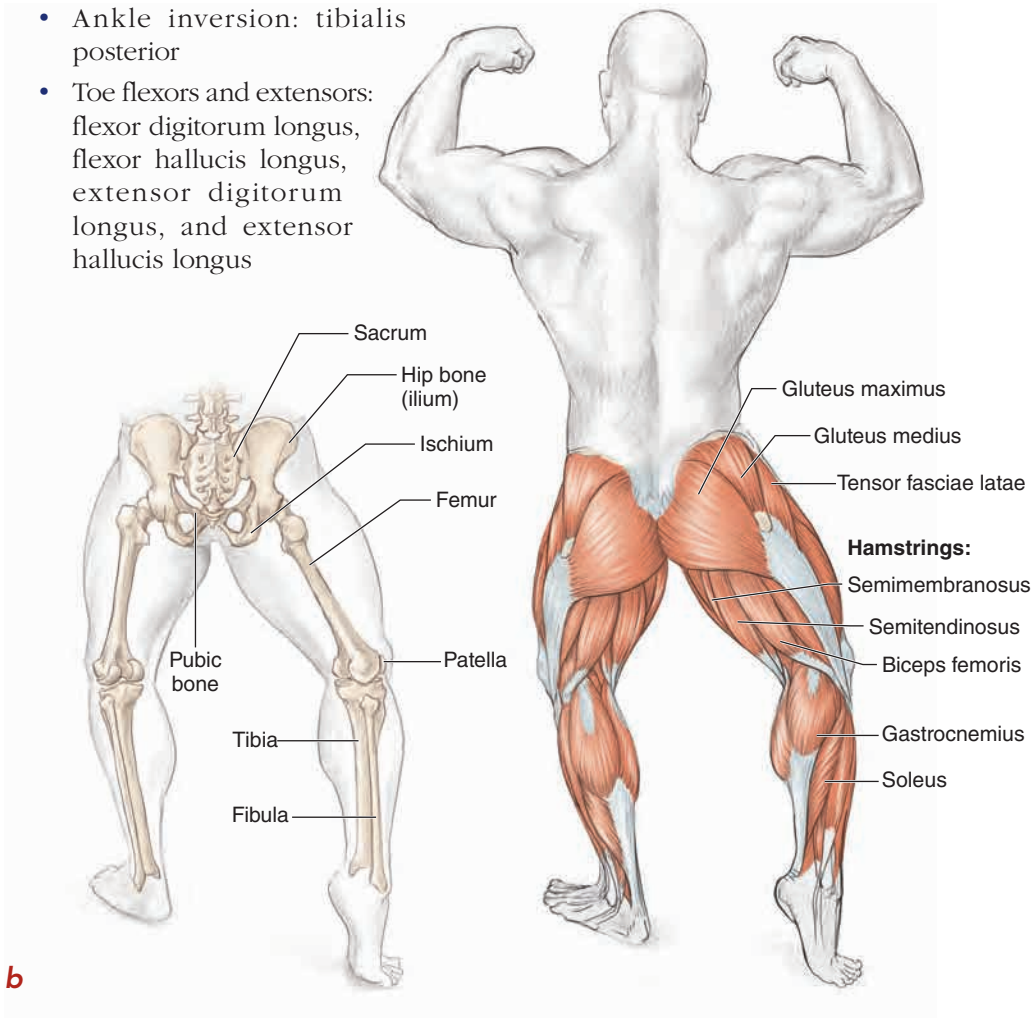
CALVES

The lower leg contains 10 muscles. The calf comprises two muscles. The gastrocnemius is the visible muscle of the calf. The two heads of the gastrocnemius—medial and lateral—arise from the rear of the femur bone, immediately above the knee joint. The soleus arises from the rear aspect of the tibia and lies underneath the gastrocnemius.

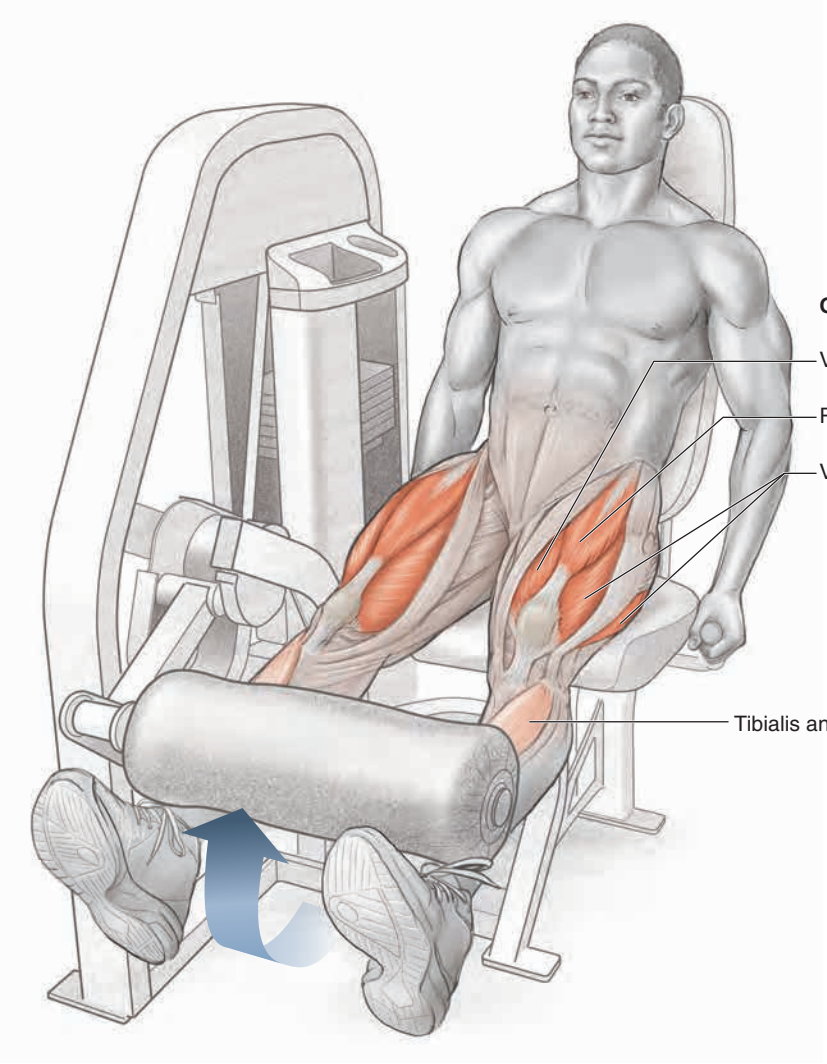
The tendons of the gastrocnemius and soleus fuse to form the Achilles tendon, which passes behind the ankle joint and attaches to the calcaneus (heel bone). The calf muscles cause plantar flexion of the ankle, the movement required for standing on tiptoes. The relative contribution of the two calf muscles depends on the angle of knee flexion. The gastrocnemius is the prime mover when the leg is straight, and the soleus becomes more active as the knee bends. Note that the gastrocnemius crosses both the knee and ankle joints and therefore serves a double function: knee flexion and ankle flexion.

The following are other lower-leg muscles:

- Ankle extension (dorsiflexion): tibialis anterior
- Ankle eversion: peroneus longus and peroneus brevis
- Ankle inversion: tibialis posterior
- Toe flexors and extensors: flexor digitorum longus, flexor hallucis longus, extensor digitorum longus, and extensor hallucis longus



LEG EXTENSION



Execution

1. Sit on the leg extension machine and place your ankles under the roller pads with your knees bent 90 degrees.
2. Raise your legs upward until your knees are straight.
3. Lower your legs back down to the starting position.

Muscles Involved

Primary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius)

Secondary: Tibialis anterior

Anatomic Focus

Foot position: Pointing your toes directly upward hits all sections of the quadriceps equally. Pointing your toes inward internally rotates the tibia to target the inner quadriceps teardrop, the vastus medialis. Pointing your toes outward externally rotates the tibia to hit the outer quadriceps, the vastus lateralis.

Foot spacing: Roller pads don't allow much space to adjust foot placement, but placing your feet close together tends to target the outer quadriceps, and a wider spacing focuses effort a little more on the inner quadriceps.

Body position: Adjust the backrest so that the backs of your knees fit snugly against the front edge of the seat and your whole thighs are supported. Leaning your torso backward or raising your buttocks off the seat extends the hip joint, stretching the rectus femoris and making this section of the quadriceps work harder during the exercise.

Range of motion: The arc of motion should be approximately 90 degrees. Forcibly contract the quadriceps at the top of the movement when the knees are fully straight. To avoid excess stress on the patella (kneecap), do not bend the knees beyond 90 degrees.

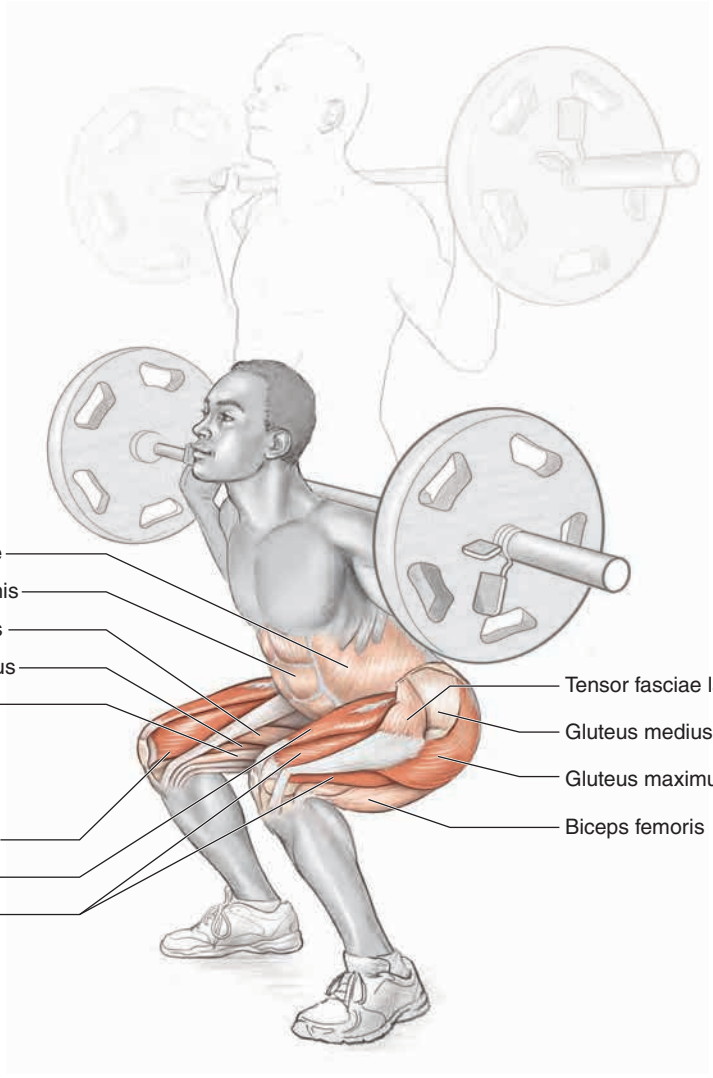
Resistance: Resistance is fairly uniform, but on many new machines the resistance increases slightly as the weight is lifted. Less resistance at the starting position minimizes stress across the kneecaps with the knees bent.

VARIATION

One-Leg Extension

Performing this exercise one leg at a time improves focus. The unilateral leg extension is particularly useful for improving thigh asymmetry or aiding in rehabilitation when one leg is injured.

BARBELL SQUAT



Execution

1. Standing with your feet shoulder-width apart, hold a barbell across the back of your shoulders with an overhand grip.
2. Slowly bend your knees until your thighs are parallel to the floor.
3. Straighten your legs to return to the starting position.

TIP *The squat is a strength exercise that utilizes nearly every muscle in the body, but for bodybuilding purposes the focus is on the thigh muscles.*

Muscles Involved

Primary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), gluteus maximus

Secondary: Hamstrings (semitendinosus, semimembranosus, biceps femoris), adductors (longus, magnus, brevis), gracilis, tensor fasciae latae, spinal erectors (sacrospinalis), abdominals (rectus abdominis, external oblique, internal oblique)

Anatomic Focus

Foot spacing: A narrow stance shifts focus to the outer quadriceps, the vastus lateralis, and abductors (tensor fasciae latae). A shoulder-width stance targets the whole thigh. A wider stance places more emphasis on the inner quadriceps, adductor muscles, and sartorius.

Foot position: Point your toes forward or slightly outward in the same direction as your thighs and knees.

Positioning: Placing a 1-inch (2.5 cm) block under both heels shifts the weight forward, placing more emphasis on the quadriceps and less on the gluteals. This adjustment is also useful for those with less flexible ankles and hips. Positioning the bar lower on the trapezius and shoulders improves balance while shifting focus to the gluteals. Powerlifters use this technique to lift more weight.

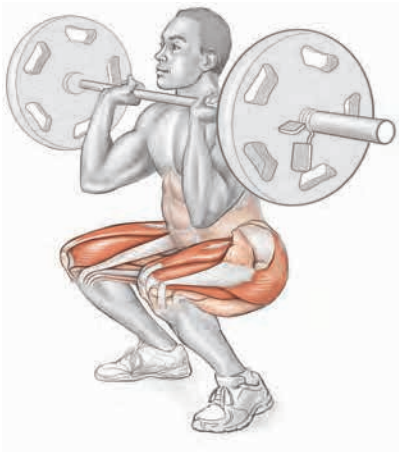
Body position: Keep your spine straight and head up at all times. Ensure that your hands are placed equidistant from the center of the bar and maintain a firm grip throughout the movement. Inhale deeply during the downward phase and exhale on the way up. Do not bend your torso forward—doing so can cause back injury.

Range of motion: As you lower the weight, stop when your knees bend to a 90-degree angle and your thighs are parallel to the floor. Squatting below parallel increases the risk of injury to the knees and spine.

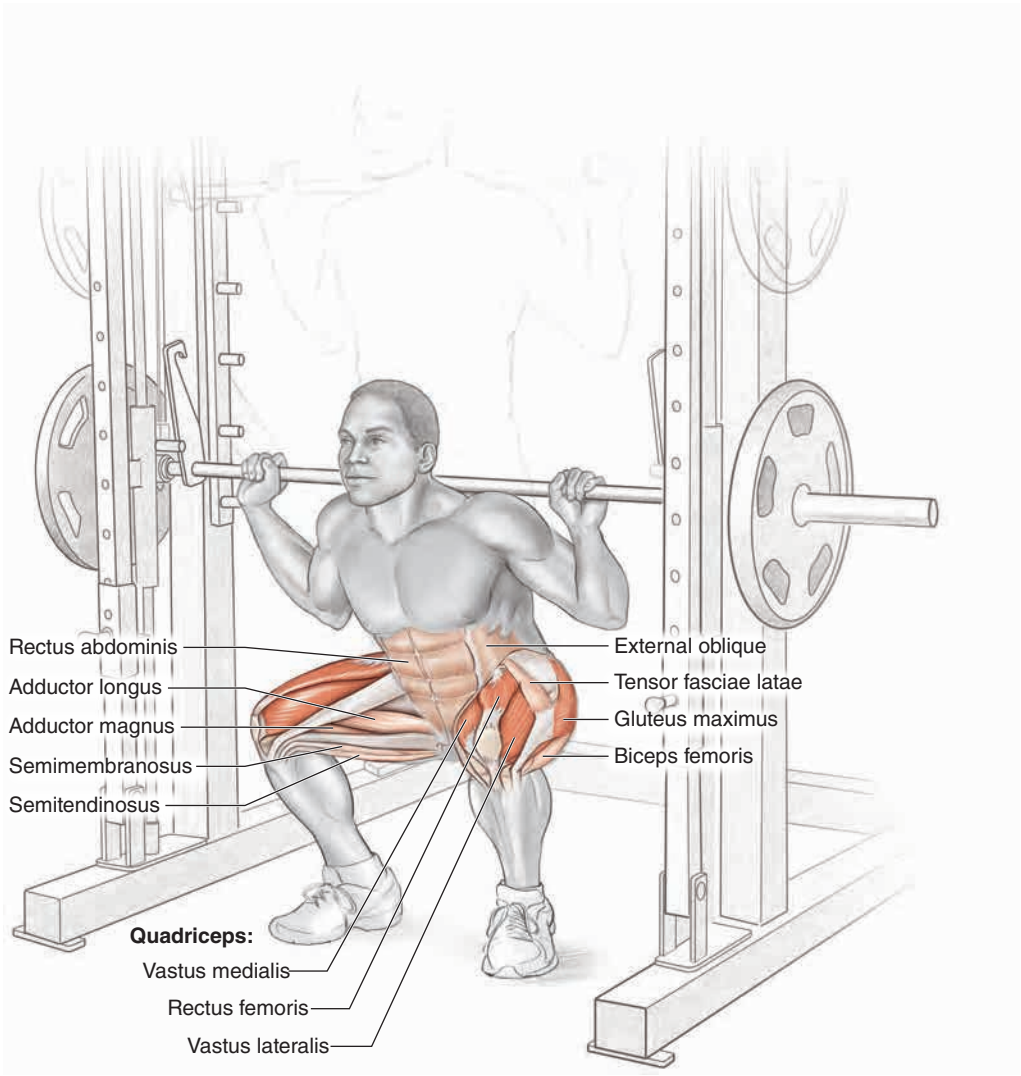
VARIATION

Front Squat

Performing the squat with the barbell held across the front of your shoulders shifts the emphasis away from the gluteals and toward the quadriceps. The front squat poses a higher degree of difficulty and requires lighter weights.



MACHINE SQUAT



Execution

1. Stand upright in a Smith machine with the bar across the back of your shoulders and your feet shoulder-width apart.
2. Slowly bend your knees until your thighs are parallel to the floor.
3. Straighten your legs to return to the starting position.

TIP *The squat is a strength exercise that utilizes nearly every muscle in the body, but for bodybuilding purposes the focus is on the thigh muscles.*

Muscles Involved

Primary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), gluteus maximus

Secondary: Hamstrings (semitendinosus, semimembranosus, biceps femoris), adductors (longus, magnus, brevis), tensor fasciae latae, spinal erectors (sacrospinalis), abdominals (rectus abdominis, external oblique, internal oblique)

Anatomic Focus

Foot position: Placing your feet close to your body emphasizes the quadriceps. Positioning your feet forward away from your body switches the focus to the gluteals and hamstrings.

Foot spacing: A narrow stance shifts focus to the outer quadriceps (vastus lateralis) and abductors (tensor fasciae latae). A shoulder-width stance targets the whole thigh. A wider stance places more emphasis on the inner quadriceps, adductor muscles, and sartorius.

Foot position: Point your toes forward or slightly outward in the same direction as your thighs and knees.

Hand position: Place your hands equidistant from the center of the bar and maintain a firm overhand grip to ensure that the bar stays in the unlocked position.

Body position: Keep your spine straight and head up at all times. Inhale deeply during the downward phase and exhale on the way up. Do not bend your torso forward—this can cause back injury.

Range of motion: As you lower the weight, stop when your knees bend to a 90-degree angle and your thighs are parallel to the floor. At the top of the movement, stopping a few degrees short of full lockout keeps tension on the quadriceps.

Resistance: In comparison with the barbell squat, the machine squat provides better balance and improves safety.

Trajectory: The Smith machine provides a single plane of vertical motion that can help focus your effort during the exercise.

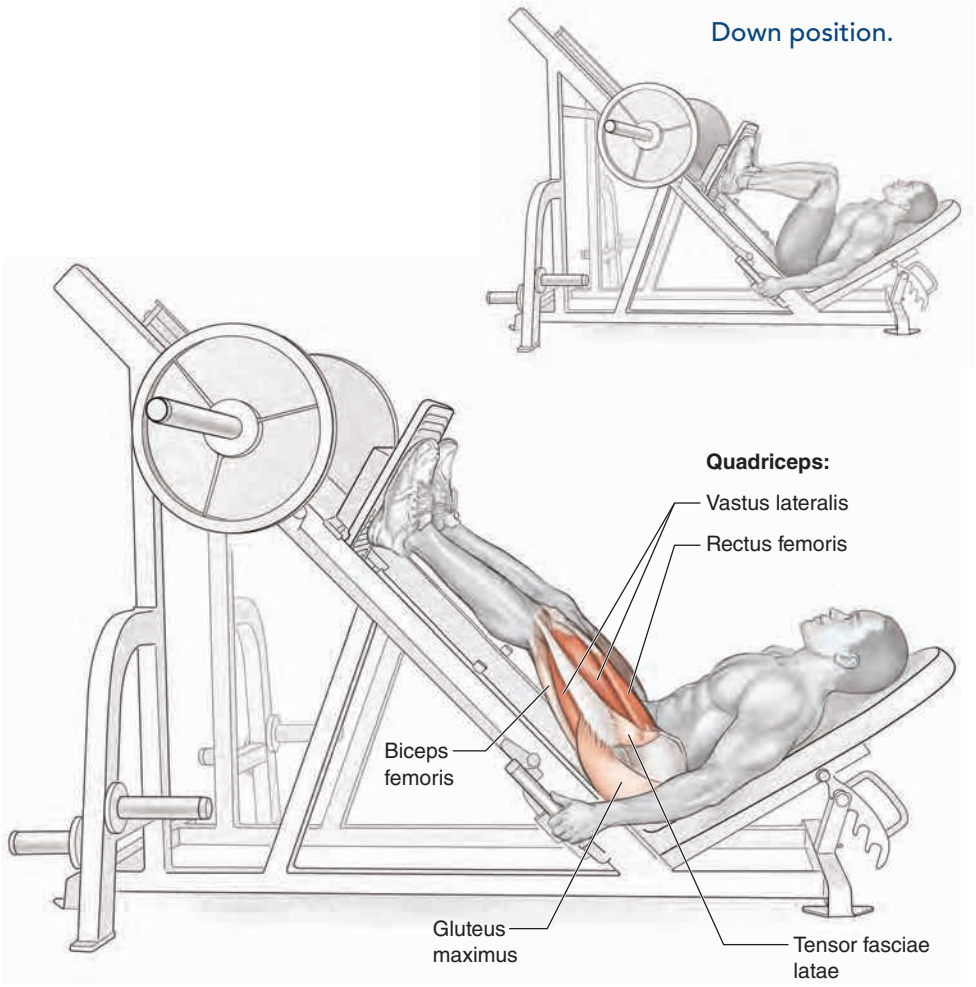
VARIATION

Machine Front Squat

Perform a front squat with the bar supported across the front of your shoulders. This places more emphasis on the quadriceps rather than the gluteals.



LEG PRESS



Execution

1. Sitting in the leg press machine, place your feet shoulder-width apart on the footplate.
2. Slowly lower the weight until your knees bend 90 degrees.
3. Push the weight back to the starting position by straightening your legs.

Muscles Involved

Primary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius)

Secondary: Gluteus maximus, hamstrings (semitendinosus, semimembranosus, biceps femoris), adductors (longus, magnus, brevis), gracilis, tensor fasciae latae

Anatomic Focus

Foot position: Placing your feet low on the footplate *(a)* emphasizes the quadriceps. Positioning your feet higher on the footplate *(b)* switches the focus to the gluteals and hamstrings.

Foot spacing: Placing your feet shoulder-width apart targets the whole thigh. A wider foot spacing *(c)* places more emphasis on the inner quadriceps (vastus medialis), adductor muscles, and sartorius. Placing your feet close together *(d)* shifts focus to the outer quadriceps (vastus lateralis) and abductors (tensor fasciae latae).

Trajectory: Pushing the weight up using the balls of your feet and allowing your heels to rise off the footplate as the weight is lowered will target the quadriceps and reduce load across your kneecaps. Pushing the weight through the heels of your feet targets the hamstrings and gluteals.

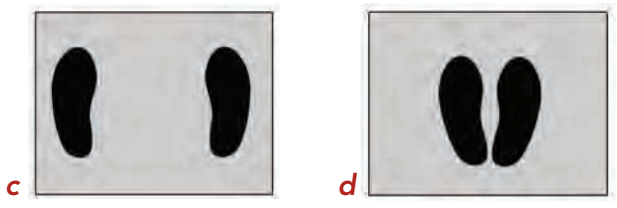
Body position: The angle your torso makes with your legs influences muscular focus and the amount of stress through your lower back. Emphasis is placed on the gluteals and hamstrings when the angle between the seat and backrest is 90 degrees, but this acute angle places more stress on your lower back. If the backrest is tilted lower toward the floor, your torso leans back; this places less stress across your lower spine and more emphasis on the quadriceps.

Range of motion: Stopping a few degrees short of full lockout at the top of the movement keeps tension on the quadriceps.

Resistance: In comparison with the barbell squat, this exercise reduces the axial load on your spine and reduces the risk of backache. Furthermore, it emphasizes the quadriceps rather than the gluteals.



Foot positions: *(a)* low on the footplate; *(b)* high on the footplate.



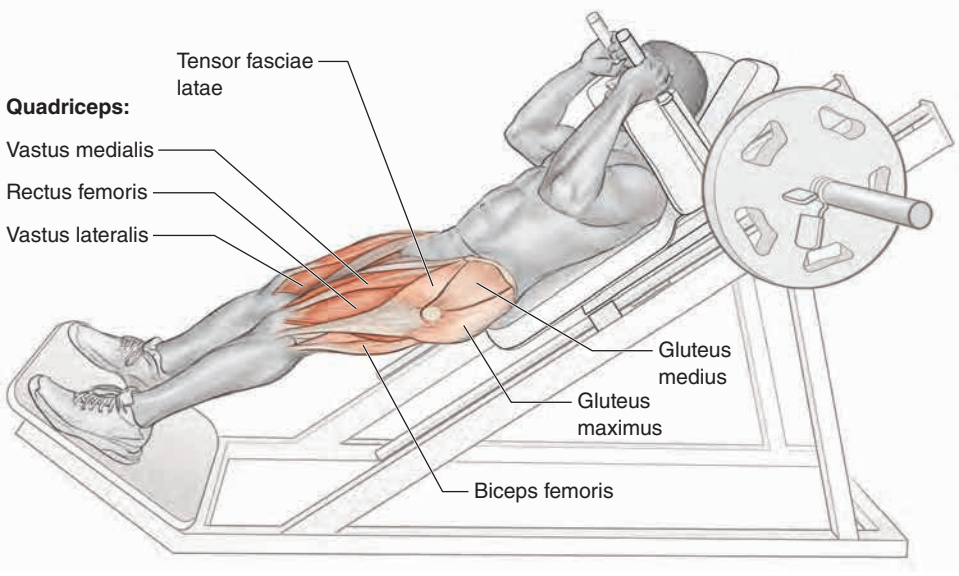
Foot spacing: *(c)* wide; *(d)* narrow.

VARIATION

One-Leg Press

Perform this exercise with one leg at a time to focus effort on a lagging thigh or to protect an injured leg.

HACK SQUAT





End position.

Execution

1. Place your back against the backrest and your shoulders under the pads of a hack squat machine. Stand with your feet shoulder-width apart on the footplate with your toes pointing forward.
2. Slowly lower the weight, bending your knees 90 degrees.
3. Push the weight back to the staring position by straightening your legs.

Muscles Involved

Primary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius)

Secondary: Gluteus maximus, hamstrings (semitendinosus, semimembranosus, biceps femoris), adductors (longus, magnus, brevis), gracilis, tensor fasciae latae

Anatomic Focus

Foot spacing: Placing your feet shoulder-width apart *(a)* targets the whole thigh. A wider foot spacing *(b)* places more emphasis on the inner quadriceps, adductor muscles, and sartorius. Placing your feet close together *(c)* shifts focus to the outer quadriceps (vastus lateralis) and abductors (tensor fasciae latae).

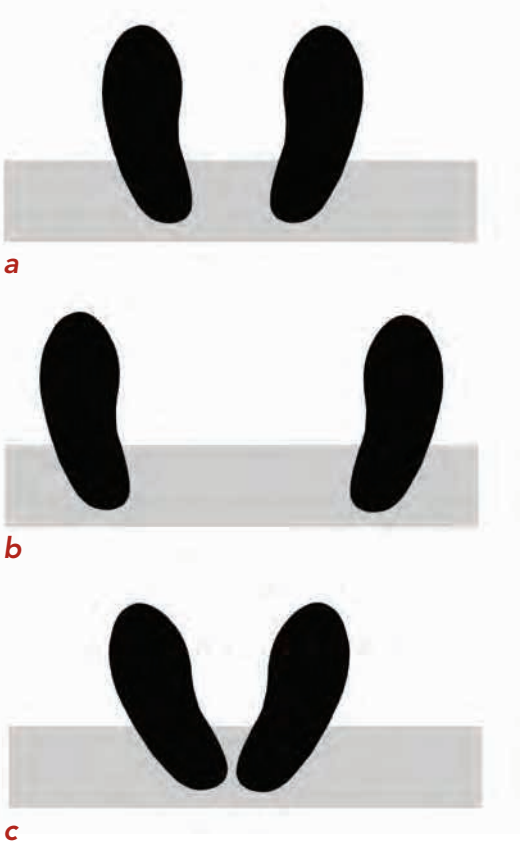
Foot position: Point your toes forward or slightly outward in the same direction as your thighs and knees. Placing your feet low on the footplate (close to your body) emphasizes the quadriceps, whereas placing your feet higher on the footplate requires more effort from the gluteals and hamstrings.

Trajectory: Pushing the weight using the forefoot and allowing your heels to rise off the footplate as the weight is lowered help isolate the quadriceps and reduce stress across the kneecaps.

Body position: Keep your spine flat against the backrest.

Range of motion: Stopping a few degrees short of full lockout at the top of the movement keeps tension on the quadriceps.

Resistance: In comparison with the barbell squat, this exercise provides support for your spine. Furthermore, it places more emphasis on the quadriceps and less on the gluteals.



Foot spacing: *(a)* shoulder width; *(b)* wide; *(c)* narrow.

VARIATIONS

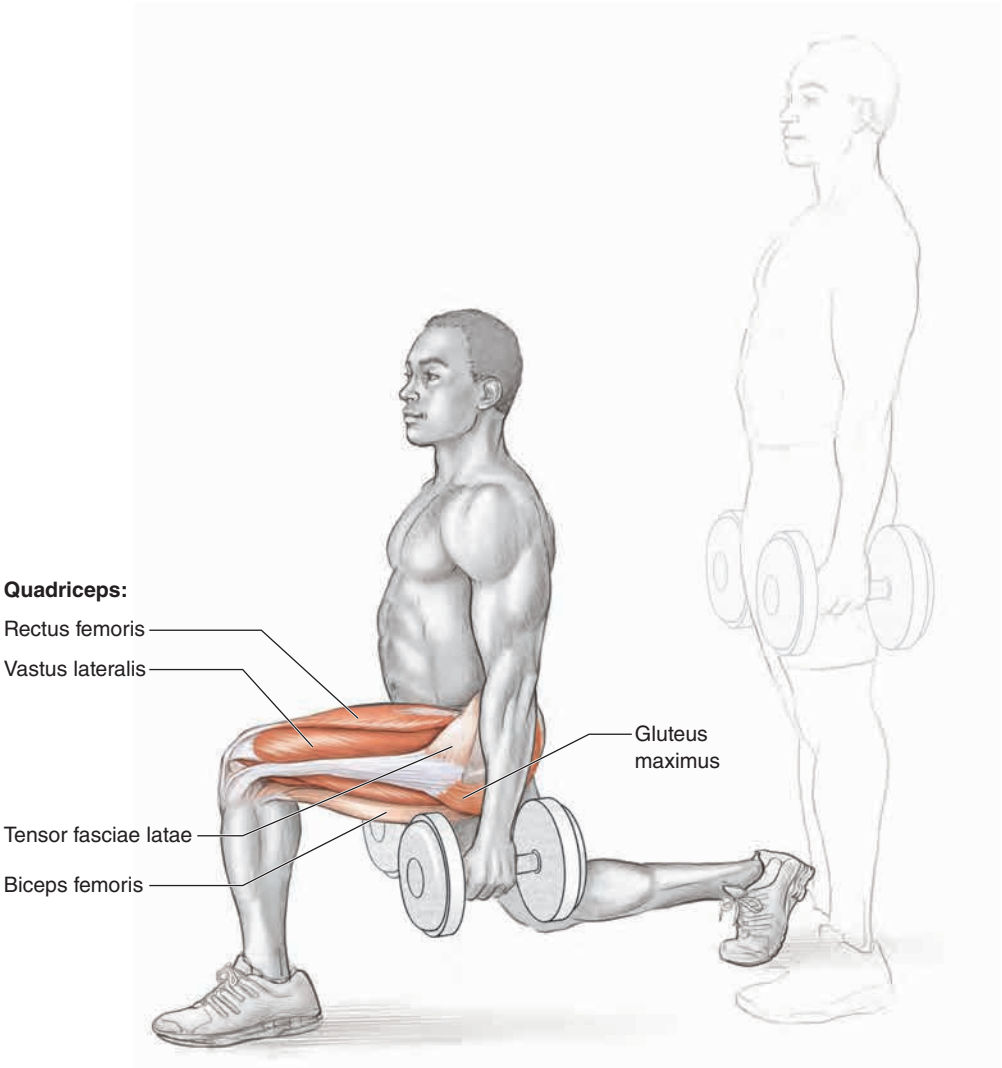
Dumbbell Squat

To combine elements of the barbell squat and the hack squat, squat while holding a dumbbell in each hand at arms' length at your sides. However, in this variation, the strength of your grip will limit the amount of weight you can use.

Reverse Hack Squat

Performing the hack squat while facing the machine switches the focus to the gluteals and hamstrings.

LUNGE



Execution

1. Standing with your feet shoulder-width apart, hold a dumbbell in each hand at arms' length by your sides.
2. Step forward with one foot and bend your knee until your leading thigh is parallel to the floor.
3. Return to the starting position and repeat with the opposite leg.

Muscles Involved

Primary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), gluteus maximus

Secondary: Hamstrings (semitendinosus, semimembranosus, biceps femoris), adductors (longus, magnus, brevis), gracilis, tensor fasciae latae

Anatomic Focus

Foot spacing: A stable, shoulder-width stance best maintains balance.

Foot position: Point your toes straight ahead or slightly outward as you step forward. Keep your back foot fixed to the floor in the same spot.

Trajectory: Take a shorter step (lunge) to target the quadriceps. A larger step places the emphasis on the gluteals and hamstrings.

Body position: As you lunge forward, place your body weight on the leading leg. Keep your torso upright and your back straight.

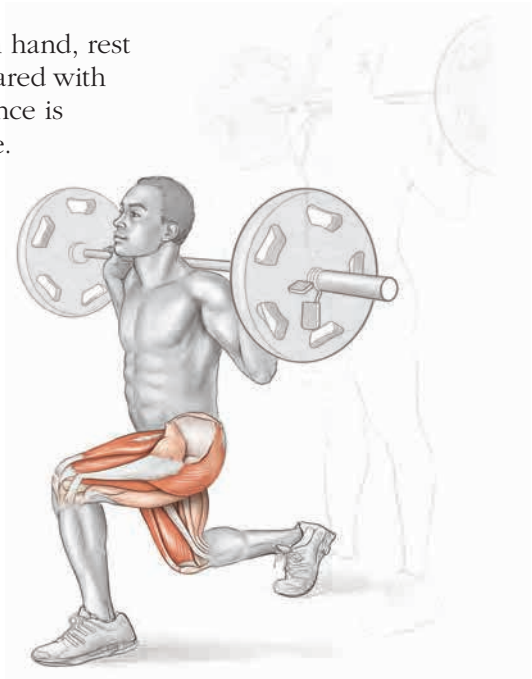
Range of motion: During the lunge, your knee should bend 90 degrees and your thigh should be parallel to the floor.

Resistance: The lunge requires a lighter weight than most other leg exercises. Using a weight that is too heavy may cause pain in the kneecaps.

VARIATIONS

Barbell Lunge

Instead of holding a dumbbell in each hand, rest a barbell across your shoulders. Compared with the dumbbell lunge, maintaining balance is more difficult during the barbell lunge.



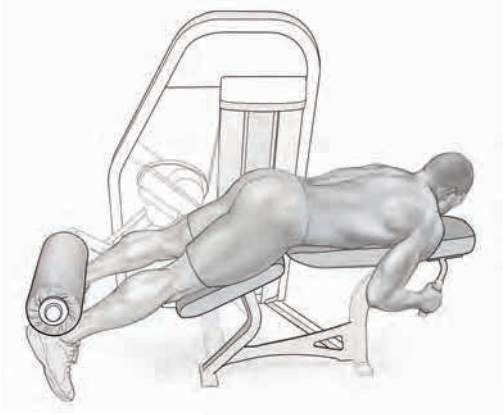
Walking Lunge

Instead of returning to the starting position after a lunge, perform one lunge after another, alternating legs so that you walk the length of the floor.

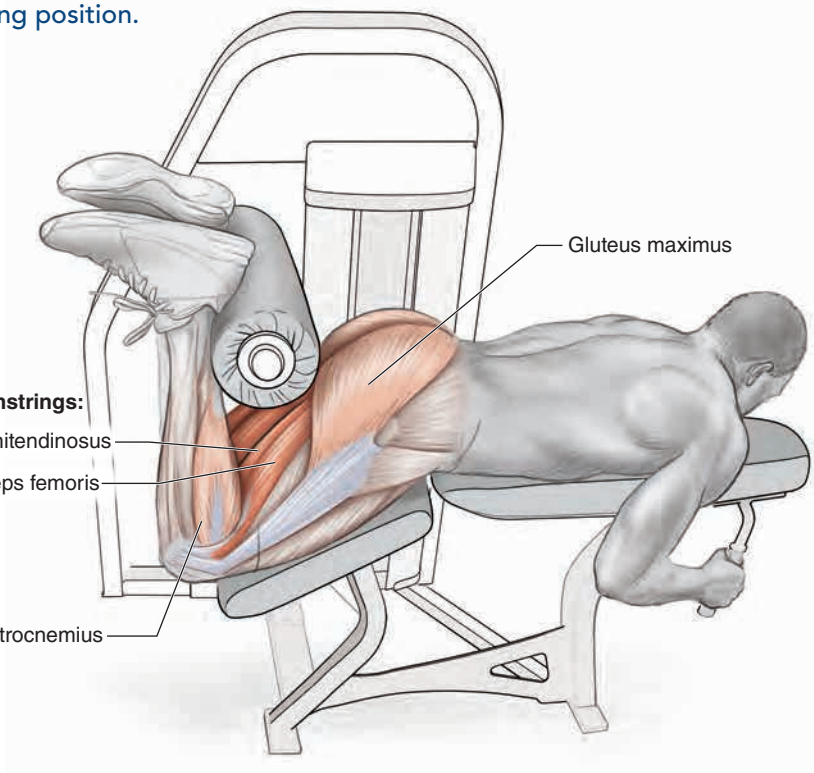
Smith Machine Lunge

Perform the lunge using a Smith machine, which provides stability and balance.

LYING LEG CURL



Starting position.



Execution

1. Lie facedown on the machine and hook your heels under the roller pads.
2. Curl the weight by bending your knees, and raise your heels toward your buttocks.
3. Lower the weight back down to the starting position.

Muscles Involved

Primary: Hamstrings (semitendinosus, semimembranosus, biceps femoris)

Secondary: Gluteus maximus, gastrocnemius

Anatomic Focus

Foot position: Pointing your toes straight *(a)* targets all three hamstrings muscles. Pointing your toes inward *(b)* emphasizes the inner hamstrings (the semimembranosus and semitendinosus). Pointing your toes outward *(c)* focuses effort on the outer hamstrings (the biceps femoris). Keeping your ankles bent 90 degrees (dorsiflexion) minimizes contribution from the calf muscles and thereby helps isolate the hamstrings. Pointing your feet (plantar flexion) allows the calf muscles to participate in the exercise.

Foot spacing: Placing your feet hip-width apart is the standard position. Wide foot spacing targets the inner hamstrings (the semimembranosus and semitendinosus), whereas narrow foot spacing emphasizes effort of the outer hamstrings (the biceps femoris). The size of the roller pad limits foot spacing.

Body position: The padded surface of most machines is angled at hip level, bending your torso forward slightly. This body position tilts your pelvis and stretches the hamstrings, thereby helping to isolate the muscles. Keep your spine straight and do not raise your chest.

Range of motion: Bend your knees as far as possible during the upward phase. Stop a few degrees short of full extension at the bottom of the movement to keep tension on the hamstrings and minimize stress across the knee joints.

Resistance: Resistance is fairly uniform, but on many new machines the resistance is lower at the starting position, where the hamstrings are fully stretched and most vulnerable to injury.



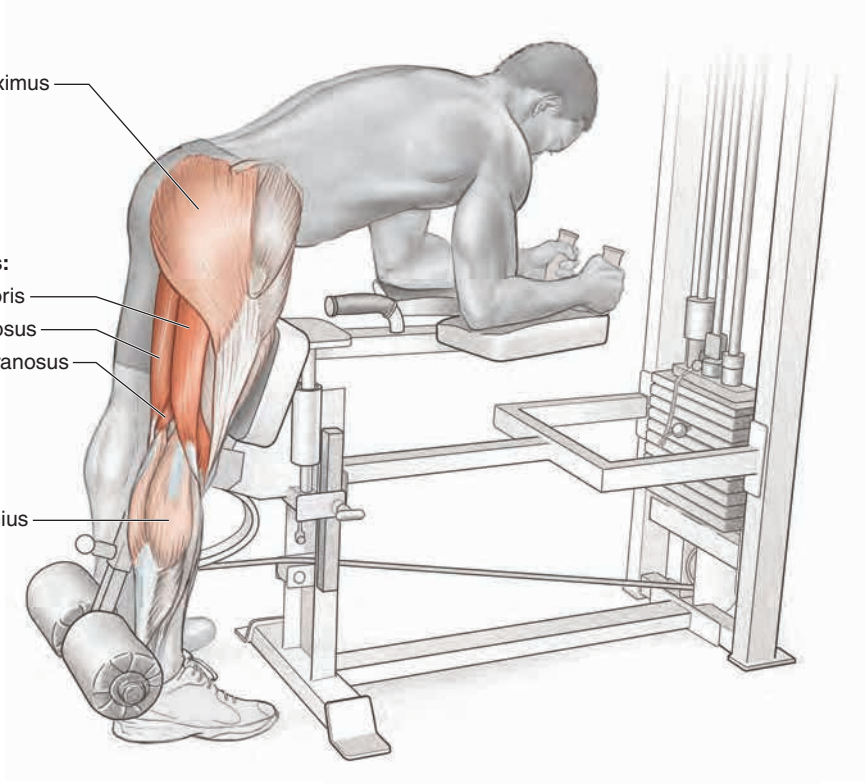
Foot positions: *(a)* toes straight; *(b)* toes inward; *(c)* toes outward.

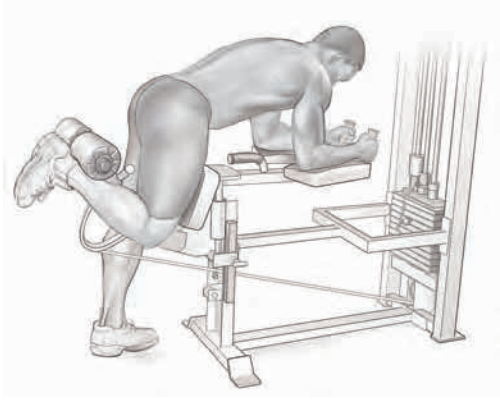
VARIATION

Seated Leg Curl

The upright backrest of the seated leg curl machine creates a 90-degree hip flexion angle between your torso and thighs. Although this body position affords a greater stretch, it prevents the hip extension that is required for a maximum contraction in the hamstrings.

STANDING LEG CURL





End position.

Execution

1. Facing the machine, hook one heel under the roller pad and support your weight with the other leg.
2. Curl the weight by bending your knee, raising your heel toward your buttock.
3. Lower the weight back down to the starting position.

Muscles Involved

Primary: Hamstrings (semitendinosus, semimembranosus, biceps femoris)

Secondary: Gluteus maximus, gastrocnemius

Anatomic Focus

Foot position: Pointing your toes straight down *(a)* targets all three hamstrings muscles. Pointing your toes inward *(b)* tends to emphasize the inner hamstrings (the semimembranosus and semitendinosus). Pointing your toes outward *(c)* focuses effort on the outer hamstrings (the biceps femoris). Keeping the ankle of the working leg bent 90 degrees (dorsiflexed) minimizes the contribution from the calf muscles and thereby helps isolate the hamstrings.

Body position: The padded surface of most machines is angled at hip level, bending your torso forward slightly. This body position tilts your pelvis and stretches the hamstrings, thereby helping to isolate the muscles. Depending on the machine design, your supporting leg may take a standing or kneeling position (see the variation).

Range of motion: Bend your knee as much as possible during the upward phase. Stop a few degrees short of full extension at the bottom of the movement to keep tension on the hamstrings and minimize stress across the knee joint.

Resistance: In contrast to the lying leg curl, this exercise is performed with one leg at a time, which helps muscle isolation and focus. Resistance is fairly uniform, but on many new machines the resistance is lower at the starting position, when the hamstrings are fully stretched and most vulnerable to injury.



Foot positions: *(a)* toes straight; *(b)* toes inward; *(c)* toes outward.

VARIATION

Kneeling Leg Curl

On the kneeling leg curl machine, a pad supports your nonworking leg and your elbows support your torso. Because your torso is bent forward at the waist, the hamstrings are stretched—an advantage over performing the exercise on the standing leg curl machine.

BARBELL STIFF-LEGGED DEADLIFT



Execution

1. Standing upright with your feet directly below your hips, hold a barbell at arms' length.
2. Bend forward at the waist, lowering the weight while keeping your legs stiff.
3. Stop before the weight touches the floor and return to the starting position.

Muscles Involved

Primary: Hamstrings (semitendinosus, semimembranosus, biceps femoris), gluteus maximus

Secondary: Spinal erectors (sacrospinalis), quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius)

Anatomic Focus

Foot spacing: Position your feet directly below your hips. A wide stance places more emphasis on the inner hamstrings.

Foot position: Point your toes directly forward or slightly outward.

Grip: Space your hands shoulder-width apart so that your arms hang vertically and your hands pass along the outer thighs. An over–under grip with one palm facing forward and the other facing back prevents the bar from rolling.

Trajectory: The bar should travel straight up and down and stay close to the body.

Body position: Your knees may be slightly bent but should be kept stiff in order to isolate the hamstrings. Keep your back straight throughout the movement. Performing this exercise with the balls of both feet on a weight plate that is half an inch (1.3 cm) thick is a safe way to prestretch the hamstrings.

Range of motion: Lower the weight until your hamstrings reach a full stretch without rounding your spine. There is no need to perform this exercise while standing on a bench or block as a means of increasing the range of motion. When your pelvis achieves full forward tilt, the hamstrings are at full stretch. Bending your lower spine does not have an effect on the hamstrings or increase the range of downward motion; rather, it merely increases the risk of injury. Depending on your flexibility, lower the barbell to a point below your knees or just above your ankles.

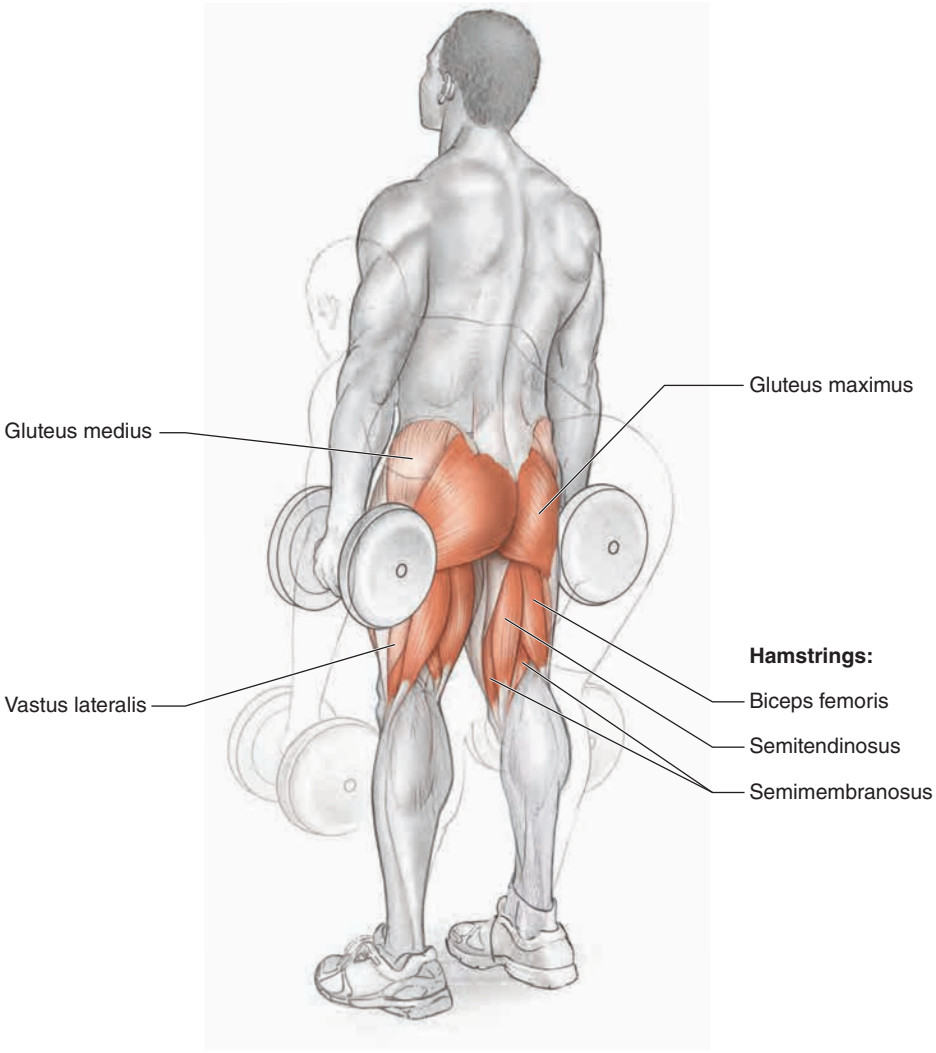
Resistance: This exercise requires a lighter weight than that used during the standard barbell deadlift for strengthening the lower back (see chapter 3).

VARIATION

Machine Stiff-Legged Deadlift

Perform this exercise using a Smith machine, as described for the machine deadlift in chapter 3.

DUMBBELL STIFF-LEGGED DEADLIFT



Execution

1. Standing upright with your feet directly below your hips, hold a dumbbell in each hand at arms' length.
2. Bend forward at the waist, lowering the weights while keeping your legs stiff.
3. Stop before the dumbbells touch the floor and return to the starting position.

Muscles Involved

Primary: Hamstrings (semitendinosus, semimembranosus, biceps femoris), gluteus maximus

Secondary: Spinal erectors (sacrospinalis), quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius)

Anatomic Focus

Foot spacing: Position your feet directly below your hips. A wide stance places more emphasis on the inner hamstrings.

Foot position: Point your toes directly forward or slightly outward.

Grip: Hold the dumbbells shoulder-width apart with your arms vertical so that the weights stay clear of your legs when they pass up and down along your outer thighs.

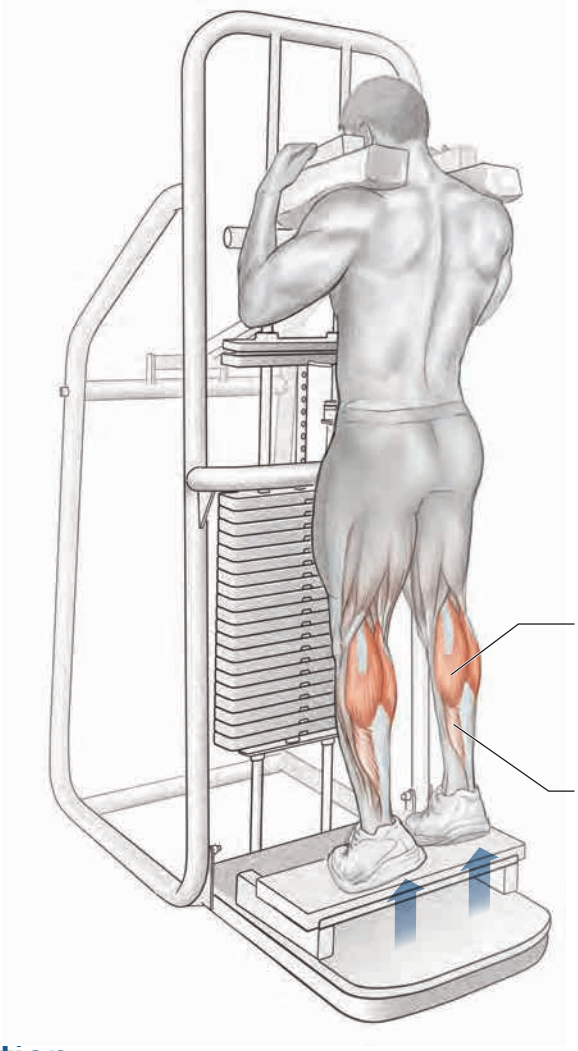
Trajectory: The dumbbells should travel straight up and down and stay close to the body.

Body position: Your knees may be slightly bent but should be kept stiff in order to isolate the hamstrings. Keep your back straight throughout the movement.

Range of motion: Lower the weight until your hamstrings reach a full stretch without rounding your spine. Depending on your flexibility, lower the dumbbells to a point below your knees or just above your ankles.

Resistance: This exercise requires a lighter weight than that used during the standard barbell deadlift for strengthening the lower back (see chapter 3).

STANDING CALF RAISE



Execution

1. Stand with your toes on the platform of the standing calf raise machine and your shoulders under the pads. Lower your heels as far as possible for a full stretch.
2. Lift the weight by raising your heels as high as possible, keeping your legs straight.
3. Slowly lower your heels back down to the starting position.

Muscles Involved

Primary: Gastrocnemius

Secondary: Soleus

Anatomic Focus

Foot position: Pointing your toes straight ahead *(a)* targets the whole gastrocnemius muscle. Pointing your toes outward *(b)* emphasizes the inner (medial) head. Pointing your toes inward *(c)* targets the outer (lateral) head.

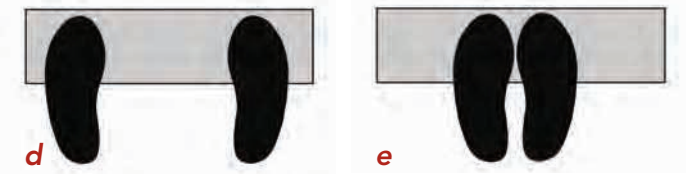
Foot spacing: Positioning your feet hip-width apart targets the whole gastrocnemius muscle. A wide stance *(d)* tends to emphasize the inner (medial) head, whereas a narrow stance *(e)* targets the outer (lateral) head.

Body position: Keep your knees stiff and your back straight. Keeping your knees locked straight stretches the gastrocnemius, which helps to focus effort on the gastrocnemius and minimizes soleus action. If your knees bend, the soleus contributes to the movement.

Range of motion: To maximize the range of motion, aim for a full stretch at the bottom of the movement and a full squeeze at the top.



Foot positions: *(a)* toes straight; *(b)* toes outward; *(c)* toes inward.



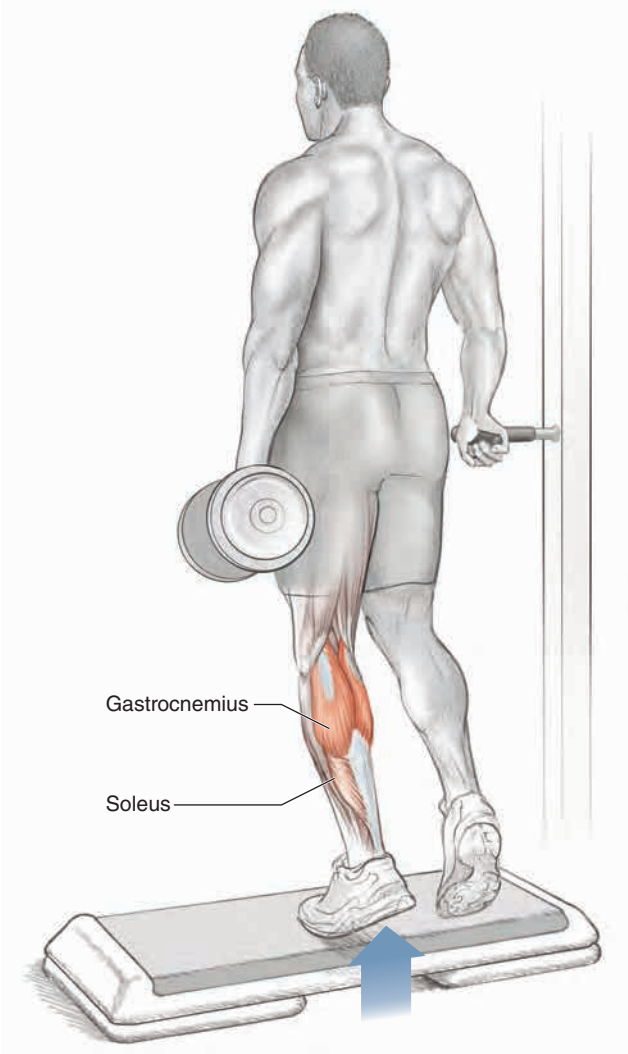
Foot spacing: *(a)* wide; *(b)* narrow.

VARIATION

Smith Machine Raise

Perform this exercise at the Smith machine while standing on a block of wood that is 3 inches (7.5 cm) thick.

DUMBBELL ONE-LEG CALF RAISE



Execution

1. Hold a dumbbell in one hand and place the toes of the same-side foot on a block that is 3 inches (7.5 cm) thick. Lower your heel as far as possible. Support your torso with your free hand.
2. Lift the weight by raising your heel as high as you can, keeping your leg straight.
3. Slowly lower your heel back down to the starting position. Perform calf raises with one leg at a time. When you have performed the desired number of repetitions, switch to the other side.

Muscles Involved

Primary: Gastrocnemius

Secondary: Soleus

Anatomic Focus

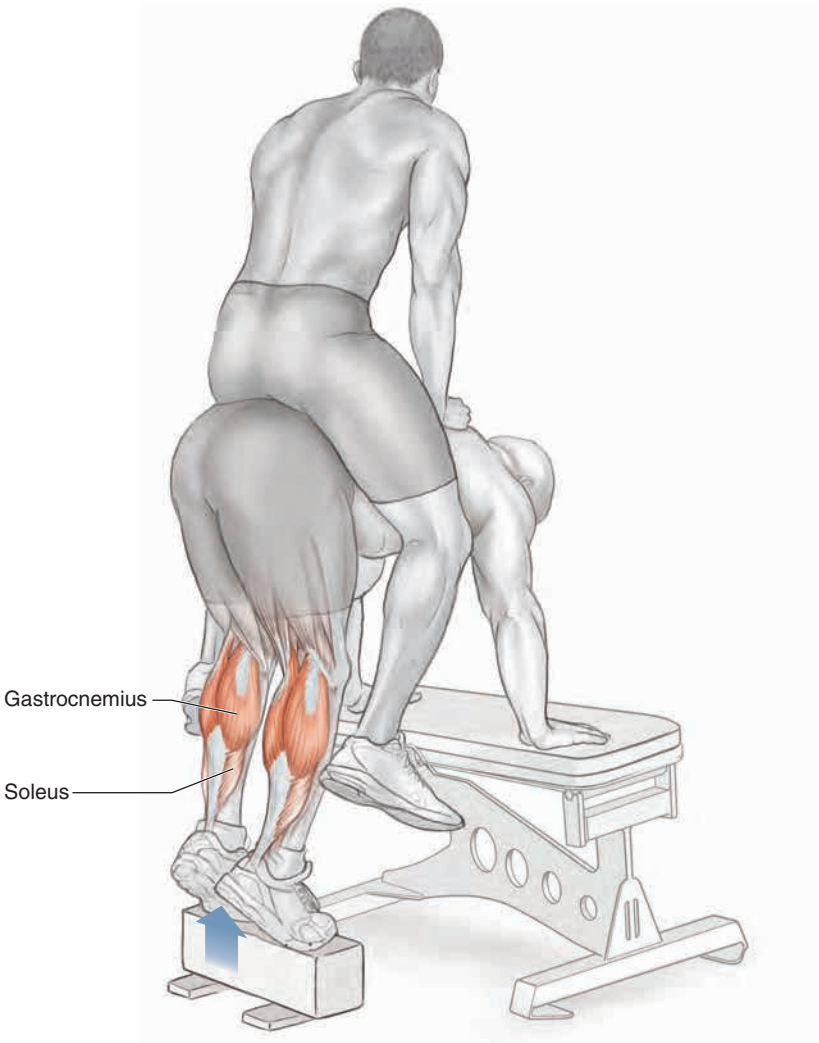
Foot position: Pointing your toes straight ahead targets the whole gastrocnemius muscle. Pointing your toes inward or outward can switch emphasis between the inner (medial) head and outer (lateral) head.

Body position: Keeping your knee fully straight helps isolate the gastrocnemius. A slight bend at the knee allows the soleus to contribute to the movement.

Range of motion: To maximize the range of motion, aim for a full stretch at the bottom of the movement and a full squeeze at the top. Movement should occur at the ankle, not the knee joint.

Trajectory: The standing block should be thick enough to allow a full range of motion without your heel touching the floor during the downward phase.

DONKEY CALF RAISE



Execution

1. Place your toes on a block that is 3 inches (7.5 cm) thick. Lean forward and support your torso on a bench. Lower your heels as far as possible.
2. Lift your body weight by raising your heels as high as you can, keeping your legs straight.
3. Slowly lower your heels back down to the starting position.

Muscles Involved

Primary: Gastrocnemius

Secondary: Soleus

Anatomic Focus

Foot position: Pointing your toes straight ahead *(a)* targets the whole gastrocnemius muscle. Pointing your toes outward *(b)* emphasizes the inner (medial) head. Pointing your toes inward *(c)* targets the outer (lateral) head.

Foot spacing: Positioning your feet hip-width apart targets the whole gastrocnemius muscle. A wide stance emphasizes the inner (medial) head, whereas a narrow stance targets the outer (lateral) head.

Body position: Keep your spine straight and your torso parallel to the floor. Keeping your knees fully straight helps isolate the gastrocnemius. A slight bend at the knees allows the soleus to contribute to the movement.

Range of motion: To maximize the range of motion, aim for a full stretch at the bottom of the movement and a full squeeze at the top.

Trajectory: The standing block should be thick enough to allow a full range of motion without your heel touching the floor during the downward phase.

Resistance: Have a training partner straddle your hips so that his or her body weight provides added resistance.



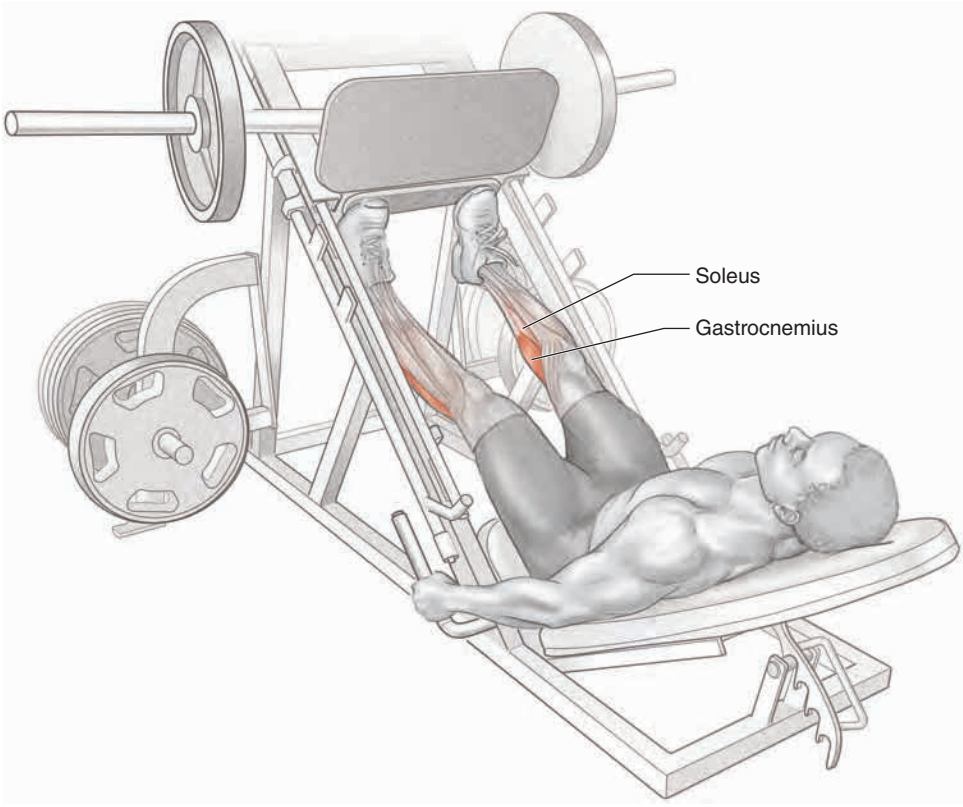
Foot positions: *(a)* toes straight; *(b)* toes outward; *(c)* toes inward.

VARIATION

Machine Donkey Calf Raise

Perform this exercise while using a machine that transmits the weight through a pad resting across your lower back.

MACHINE CALF RAISE



Execution

1. Sit in a leg press machine. Place the balls of your feet on the edge of the footplate and lower the weight as far as possible, keeping your knees straight.
2. Push the weight up as far as you can, contracting your calf muscles.
3. Slowly lower the weight back down to the starting position.

Muscles Involved

Primary: Gastrocnemius

Secondary: Soleus

Anatomic Focus

Foot position: Point your toes straight ahead *(a)* to target the whole gastrocnemius muscle. Point your toes outward *(b)* to emphasize the inner (medial) head of the gastrocnemius. Point your toes inward *(c)* to target the outer (lateral) head of the gastrocnemius.

Foot spacing: Positioning your feet hip-width apart targets the whole gastrocnemius muscle. A wide stance emphasizes the inner (medial) head, whereas a narrow stance targets the outer (lateral) head.

Body position: In biomechanical terms, this exercise could be called a seated straight-leg calf raise. Keep your knees stiff so that movement occurs exclusively at the ankle. Keeping your knees fully straight helps isolate the gastrocnemius. A slight bend at the knees allows the soleus to contribute to the movement.

Range of motion: To maximize the range of motion, aim for a full stretch at the bottom of the movement and a full squeeze at the top.

Resistance: On the leg press machine, resistance is transmitted through the footplate. Because your knees are held straight and your torso is bent 90 degrees to your legs, this exercise is similar to the donkey calf raise (described earlier).



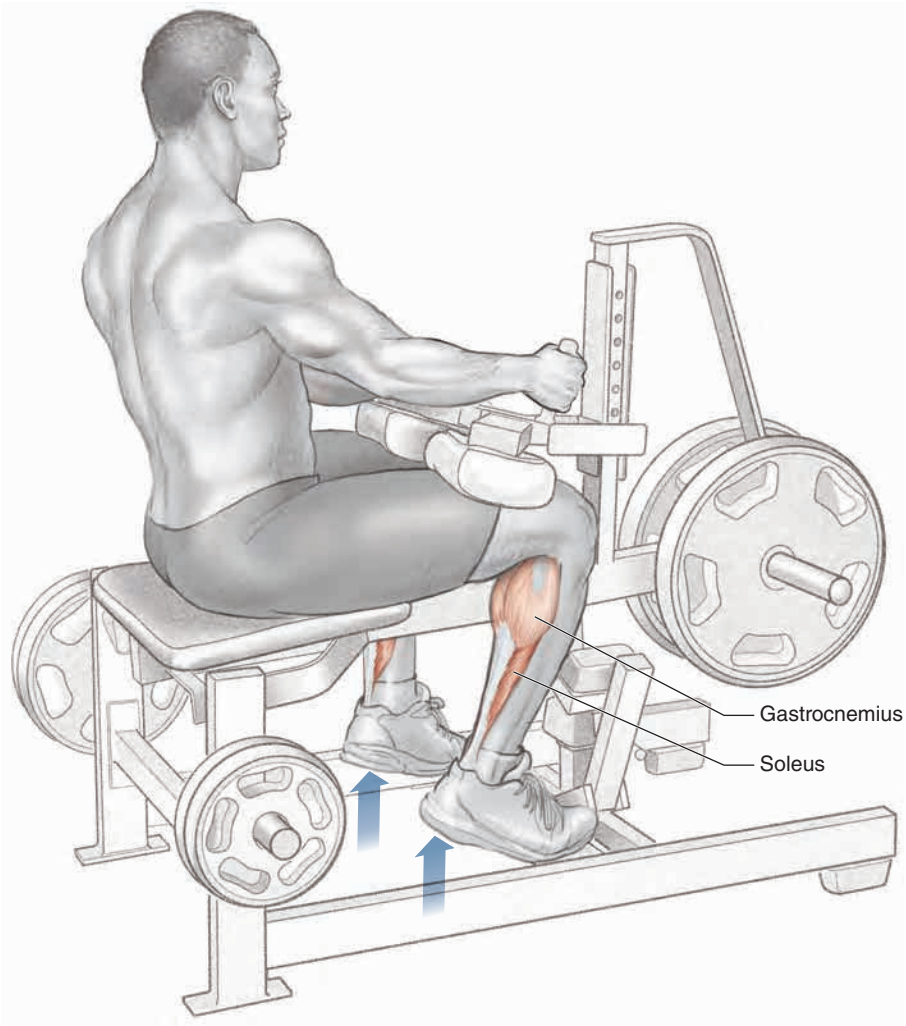
Foot positions: *(a)* toes straight; *(b)* toes outward; *(c)* toes inward.

VARIATION

Calf-Sled Machine

The calf-sled machine typically uses a fixed foot plate with resistance transmitted through a mobile torso sled. Lie supine on the sled with your shoulders against the pads and your feet on the platform. Place the toes and balls of your feet on the footplate, legs straight. Lower your heels for a full stretch then lift the weight by raising your heels as high as possible.

SEATED CALF RAISE



Execution

1. Place the balls of your feet on the platform of the seated calf machine, place the pads across your lower thighs, and lower your heels as far as possible.
2. Lift the weight by raising your heels as high as you can.
3. Slowly lower your heels back down to the starting position.

Muscles Involved

Primary: Soleus

Secondary: Gastrocnemius

Anatomic Focus

Foot position: Pointing your toes straight ahead *(a)* targets the whole calf muscle. Pointing your toes outward *(b)* emphasizes the inner calf. Pointing your toes inward *(c)* targets the outer section of the muscle.

Foot spacing: Positioning your feet hip-width apart targets the whole calf muscle. A wide stance emphasizes the inner (medial) head, whereas a narrow stance targets the outer (lateral) head.

Body position: Position the pad just above your knees, not too high on the thighs. In the seated position, the bent knee places emphasis on both the soleus and the gastrocnemius.

Range of motion: To maximize the range of motion, aim for a full stretch at the bottom of the movement and a full squeeze at the top.



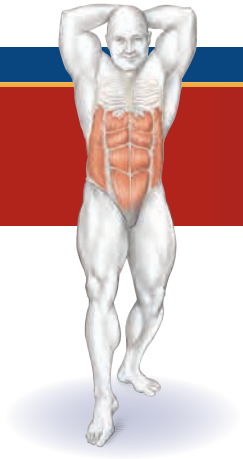
Foot positions: *(a)* toes straight; *(b)* toes outward; *(c)* toes inward.

VARIATION

Barbell Seated Calf Raise

Perform this exercise while seated on a bench with your toes on a block and a barbell resting across your lower thighs.

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chapter 6

ABDOMINALS

The abdominal wall (figure 6.1) can be divided into two anatomic parts, each of which functions differently. The front wall consists of one muscle, the rectus abdominis (also known as the abs). This muscle arises from the lower margin of the rib cage and sternum and passes vertically downward to attach on the pubic bone. The two rectus abdominis muscles (one on each side) are encased in a sheath of fascia that forms the central demarcation down the middle of the abs, known as the linea alba. Fascia divisions in the muscles are responsible for the six-pack appearance. The rectus abdominis muscles cause flexion of the trunk, bending the torso forward toward the legs. The motion is carried out by the upper abs, which pull the rib cage down toward the pelvis, or by the lower abs, which lift the pelvis up toward the chest.

The side wall consists of three layers of muscles. The external oblique is the outer visible layer that passes obliquely downward from the rib cage to the pelvic bone. The internal oblique is the middle layer that passes obliquely upward from the pelvic bone to the ribs. The internal oblique lies under the external oblique, and the fibers of the two muscles pass at right angles to one another. The transversus abdominis is the innermost layer that lies horizontally across the abdominal wall. Contraction of the oblique muscles on one side causes the torso to bend sideways. Contraction of the obliques simultaneously on both sides assists the rectus muscle in flexing the trunk and splints the abdominal wall whenever a weight is lifted. Note that only the outer external oblique is visible.

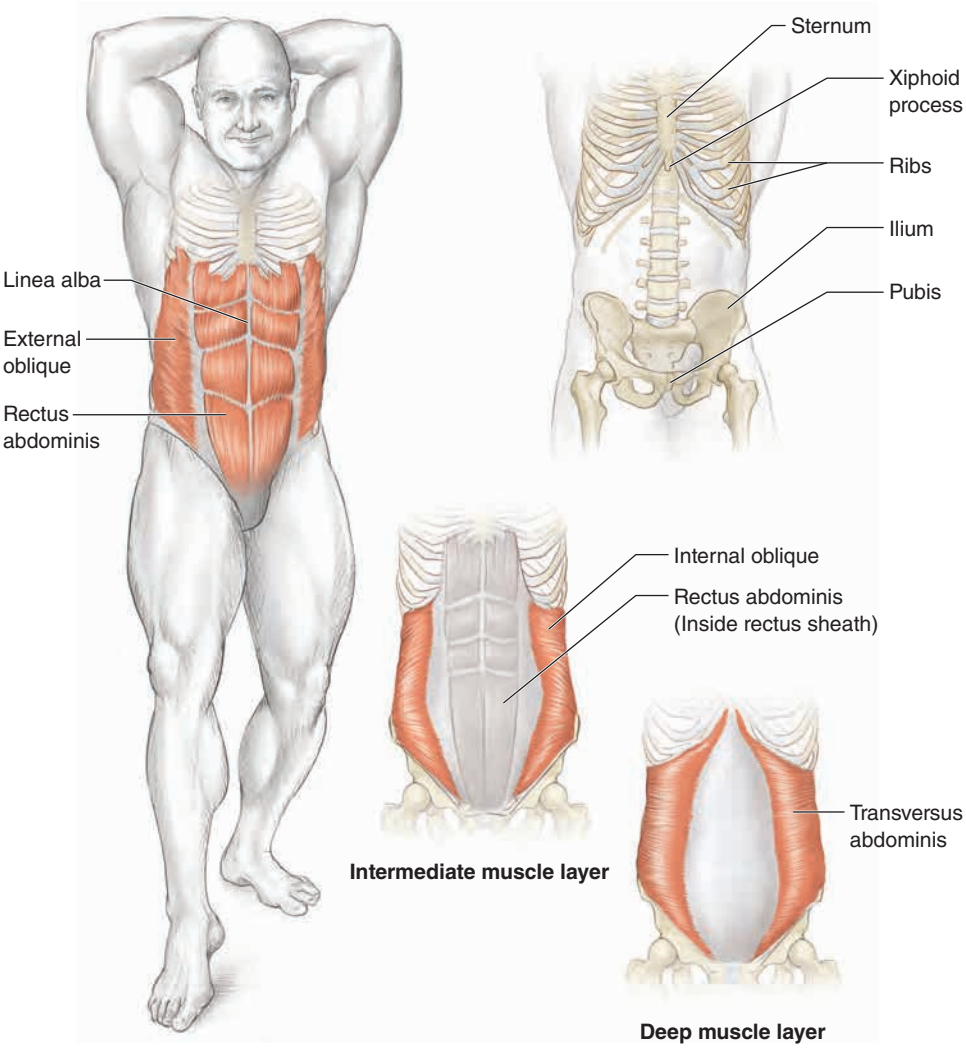


Figure 6.1 Showcasing the abdominals.

The serratus anterior muscle forms part of the side wall of the chest. This muscle arises from the scapula behind and passes forward around the chest wall to attach to the upper eight ribs. The serrated edge of this muscle emerges from beneath the outer margin of the pectoralis muscle, sending fingerlike projections into the external oblique. The serratus anterior pulls (or protracts) the scapula forward, stabilizing the scapula against the chest wall. The serratus anterior provides an essential accessory function whenever the pectoralis major and latissimus dorsi muscles contract. It can also be targeted during exercises that work the oblique muscles. For more on the serratus anterior muscle, see chapter 2.

An effective abdominal workout should include exercises that target all areas of your midsection. For your upper abdominals, select crunches or sit-ups. For your lower abdominals, choose from leg raises, knee-ups, or reverse crunches. To complete your workout, target the side wall with twisting maneuvers, oblique crunches, or side bends.



Execution

1. Hook your feet under the pad of a decline bench and sit on the bench with your torso upright.
2. Lower your torso backward until it is almost parallel to the floor.
3. Return to the upright position by bending at the waist.

Muscles Involved

Primary: Rectus abdominis

Secondary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), hip flexors (sartorius, iliopsoas)

Anatomic Focus

Hand position: You may hold your hands together behind your lower back, cross them in front of your chest, or interlock them behind your head. The relative resistance increases as your hands shift from your lower back to your chest to your head.

Foot position: Secure your feet under a roller pad or comparable support.

Body position: Bend your knees to reduce stress on the lower back.

Range of motion: Your torso should be vertically upright in the sitting position, with your abdomen almost touching your thighs. Lower your torso backward until it is almost parallel to the floor, about three-quarters of the way down. Do not lean back too far because stress is placed on the lower back when tension is released from the abdominals.

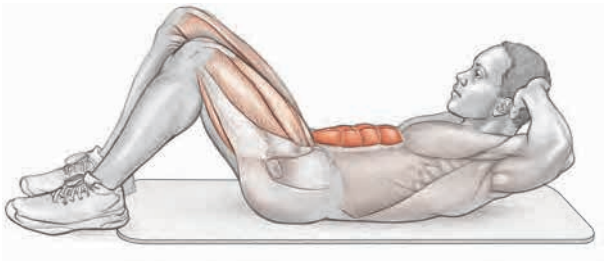
Trajectory: The decline angle of the bench is typically 30 to 45 degrees. Tilting the bench at a steeper angle makes the exercise more difficult.

Resistance: Add resistance by tilting the bench at a steeper angle or holding a weight plate to your chest.

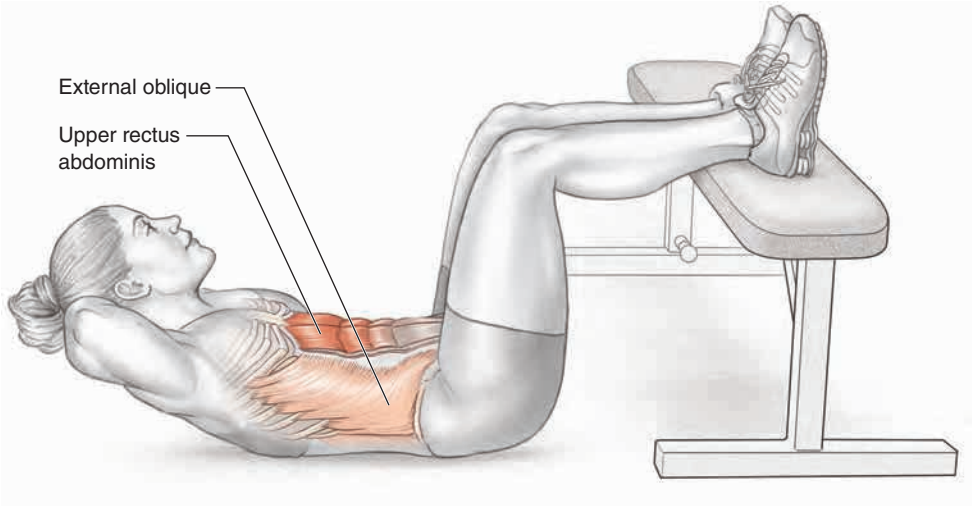
VARIATION

Floor Sit-Up

Perform this exercise while seated on the floor with your knees bent and your feet secured to the floor.



CRUNCH



Execution

1. Lie flat on the floor, hips bent 90 degrees, with hands behind your head.
2. Raise your shoulders off the floor and crunch your chest forward, keeping your lower back in contact with the floor.
3. Lower your shoulders to the starting position.

Muscles Involved

Primary: Upper rectus abdominis

Secondary: External oblique, internal oblique

Anatomic Focus

Hand position: You may position your hands at your sides or across your chest, or you may interlock them behind your head. The resistance increases as your hands shift from your sides to your chest to your head.

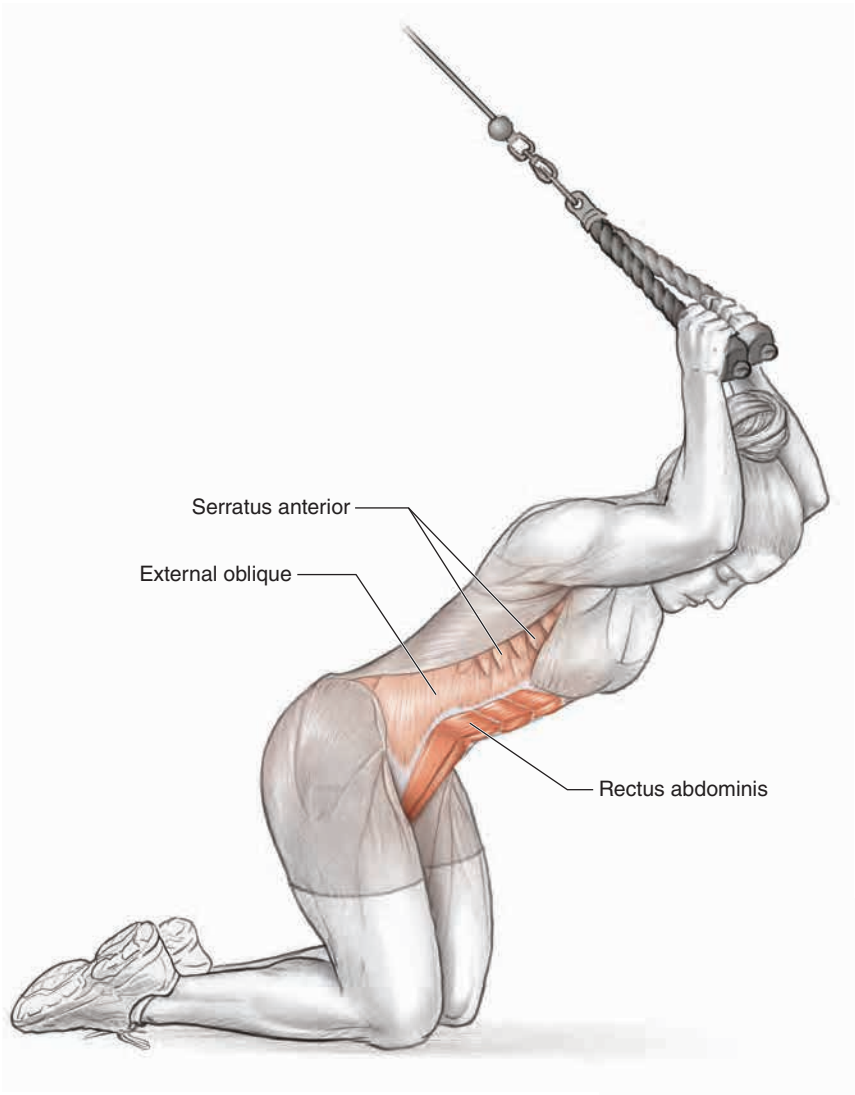
Foot position: You may place your feet on the floor close to your buttocks or elevate them on a bench. Elevating your legs increases resistance.

Body position: Your thighs should be positioned at an angle of 90 degrees to your torso. You may support your lower legs on top of a flat bench, or you can position your feet on the floor close to your buttocks.

Range of motion: The crunch motion occurs in the upper spine, and your shoulders rise a few inches off the floor. Your lower back remains in contact with the floor, and no motion occurs at the hips. This is in contrast to the sit-up, where the movement occurs at the waist and hips.

Resistance: You can increase the degree of difficulty by placing your hands behind your head or by elevating your legs on a bench.

ROPE CRUNCH





End position.

Execution

1. Kneel on the floor beneath a high pulley, facing either away from or toward the weight stack. Grab the rope attachment with both hands behind your head.
2. Crunch the weight downward, curling your torso and bending at the waist.
3. Return to the starting position.

Muscles Involved

Primary: Rectus abdominis

Secondary: External oblique, internal oblique, serratus anterior

Anatomic Focus

Hand position: You may hold the rope above your head, on either side of your head, or in front of your upper chest. The higher your hands are, the greater the difficulty.

Body position: You may perform this exercise while facing either toward or away from the weight stack, depending on personal preference.

Range of motion: Your torso should move from the upright position to almost parallel to the floor.

Trajectory: If you position yourself a short distance away from the pulley, you will benefit from a greater range of motion when you crunch.

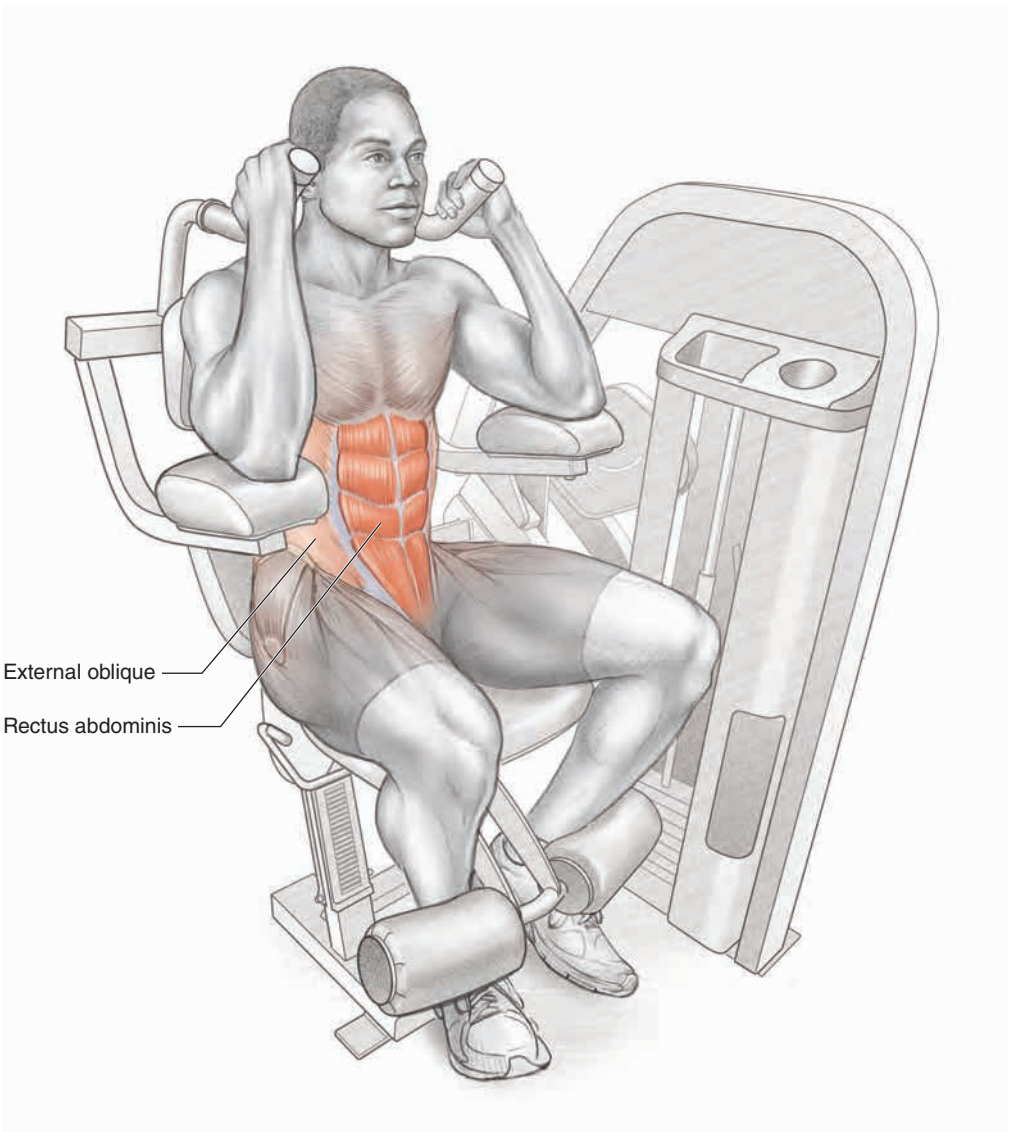
Resistance: Alter resistance by adjusting the weight stack.

VARIATION

Machine Rope Crunch

A variety of machines replicate the rope crunch. Some machines provide a lumbar pad to support the lower back during torso motion, with resistance provided by an overhead cable pulley.

MACHINE CRUNCH



Execution

1. Sitting in the seat of the crunch machine, grasp the handles and place your feet under the ankle pads.
2. Crunch down, curling your torso toward your knees.
3. Return to the upright position.

Muscles Involved

Primary: Rectus abdominis

Secondary: External oblique, internal oblique, serratus anterior

Anatomic Focus

Hand position: Depending on the machine's design, your hands grasp handles alongside your head or simply rest on the chest pad.

Foot position: Feet may be positioned on the floor or hooked under ankle pads, depending on the machine's design.

Body position: On some machines the handles provide resistance, whereas on other machines resistance is transmitted via a chest pad.

Range of motion: Your torso should move from the upright position to almost parallel to the floor.

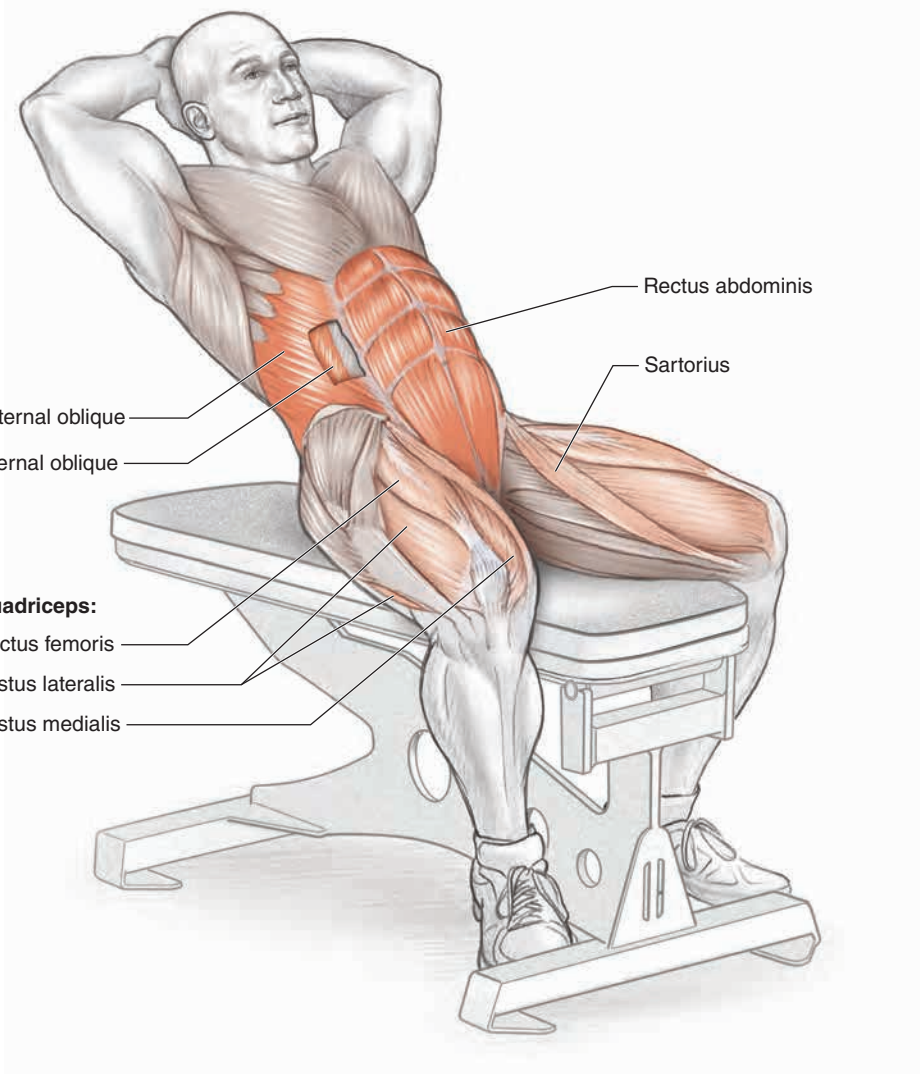
Resistance: Depending on the machine's design, you move the weight by either holding the handles or moving a chest pad. Adjust the weight stack to vary the resistance.

VARIATION

Machine Crunch With Chest Pad

On some abdominal machines, the resistance is provided by a chest pad instead of handles.

SEATED SIT-UP



Execution

1. Sitting upright on the seated sit-up apparatus, bend your knees and secure your feet under the support pad.
2. Lower your torso backward until it is almost parallel to the floor.
3. Return to an upright position by bending at the waist.

Muscles Involved

Primary: Rectus abdominis, external oblique, internal oblique

Secondary: Quadriceps (rectus femoris, vastus lateralis, vastus medialis, vastus intermedius), hip flexors (sartorius, iliopsoas)

Anatomic Focus

Body position: Sit on the apparatus with your knees bent 90 degrees.

Foot position: Secure your feet under a roller pad or comparable support.

Hand position: You may hold your hands together behind your lower back, cross them in front of your chest, or interlock them behind your head. The relative resistance increases as your hands shift from your lower back to your chest to your head.

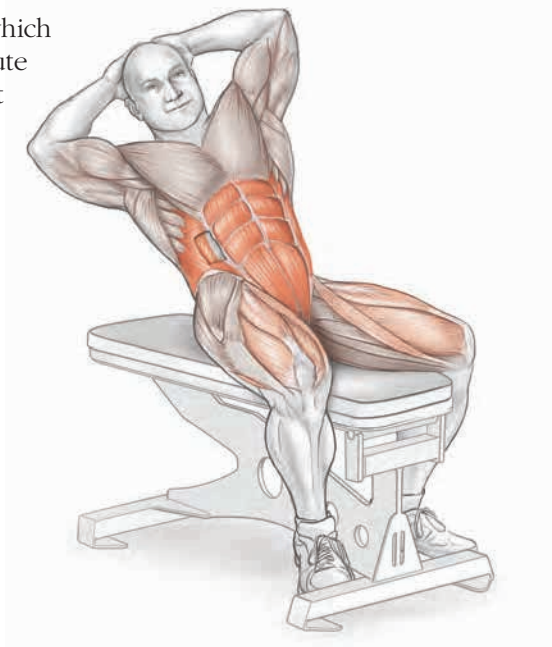
Range of motion: Your torso should be close to vertically upright in the starting position and should lower back approximately 60 to 90 degrees during the exercise. Tension is released from the abdominal muscles when you lean too far back or bend too far forward.

Resistance: You can add resistance by holding a weight plate to your chest.

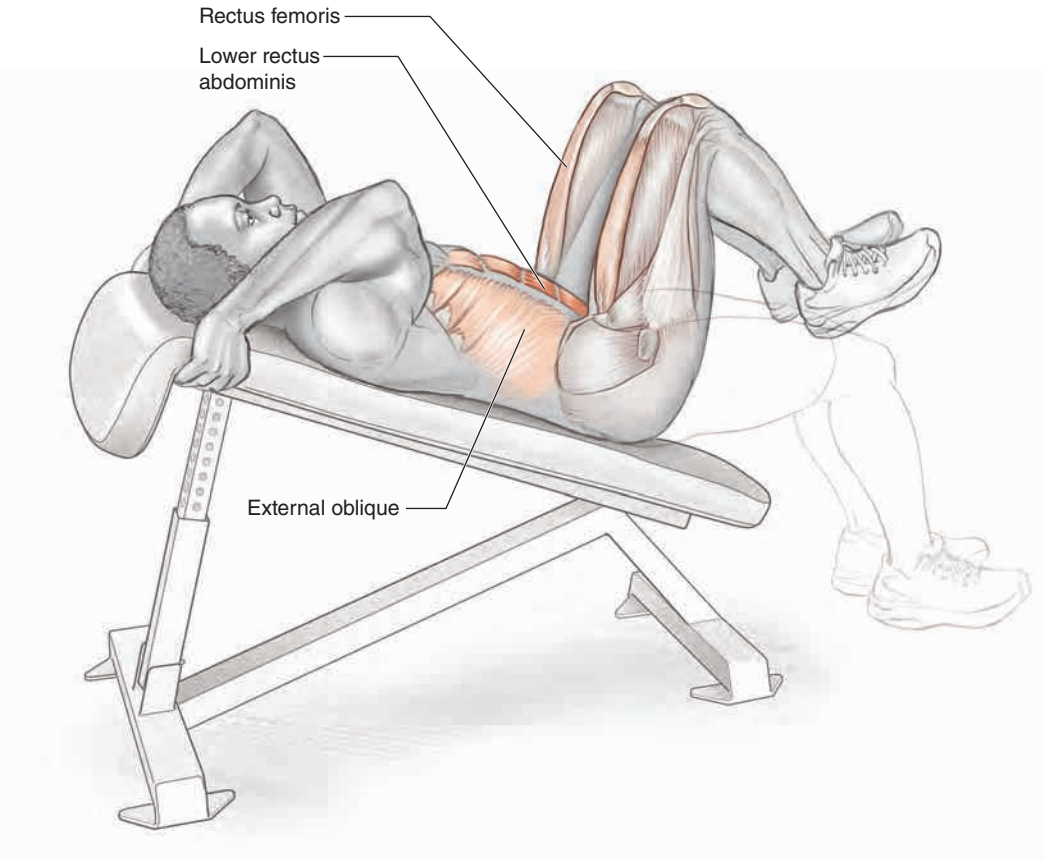
VARIATION

Twisting Seated Sit-Up

Add a twisting motion during the sit-up, which allows the oblique muscles to contribute more to the exercise. As you sit up, twist your torso, directing your right elbow toward your left knee. Lower your back to the starting position. During the next repetition, direct your left elbow toward your right knee.



INCLINE LEG RAISE



Execution

1. Lie supine (face up) on an incline abdominal bench with your legs down, hands holding onto the bench above and behind your head.
2. Raise your legs at the hips and pull your thighs toward your chest, keeping your knees slightly bent.
3. Slowly lower your legs to the starting position.

Muscles Involved

Primary: Lower rectus abdominis

Secondary: External oblique, internal oblique, iliopsoas, rectus femoris

Anatomic Focus

Hand position: Your hands stabilize your torso by grasping the bench or handles above your head.

Foot position: Keep your feet together and your knees slightly bent.

Body position: Your upper torso should remain in contact with the bench. As you raise your legs, lift your pelvis off the bench slightly to maximize contraction in the lower abdominals.

Range of motion: To maximize muscle contraction on the way up, raise your knees as high as possible toward your chest. To keep tension on the abs, do not lower your legs all the way down or allow your feet to touch the floor.

Trajectory: The angle of the bench to the floor affects the degree of difficulty. Tilting the bench at a steeper angle makes the exercise more difficult.

Resistance: Reduce resistance by lowering the bench and decreasing the incline. Increase resistance by raising the bench and increasing the incline.

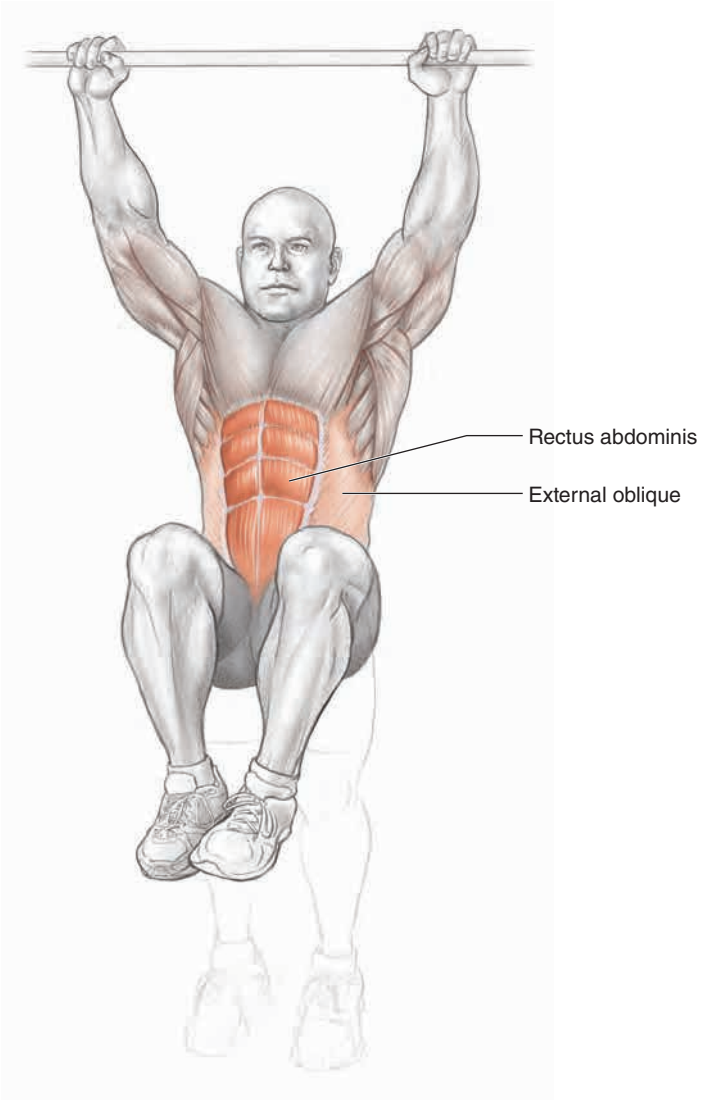
VARIATION

Dumbbell Incline Leg Raise

For added resistance, perform this exercise while holding a dumbbell between your feet.



HANGING LEG RAISE



Execution

1. Grasp a chin-up bar with your hands or place your elbows in a pair of ab slings. (These attach to the bar to support your body weight.) Let your legs hang down.
2. Lift both knees, together and slightly bent, toward your chest.
3. Slowly lower your legs to the starting position without swinging.

Muscles Involved

Primary: Rectus abdominis

Secondary: External oblique, internal oblique, iliopsoas, rectus femoris

Anatomic Focus

Hand position: Take a shoulder-width overhand grip on the chin-up bar and hang with your arms straight. Alternatively, use a pair of supportive upper-arm sleeves, like the ab sling device.

Foot position: Keep your feet together and your knees slightly bent.

Body position: Your torso should hang vertically, perpendicular to the floor.

Range of motion: Raise your knees as high as possible to maximize muscular effort. As you lower your legs, keep your knees slightly bent to maintain tension on the abdominals.

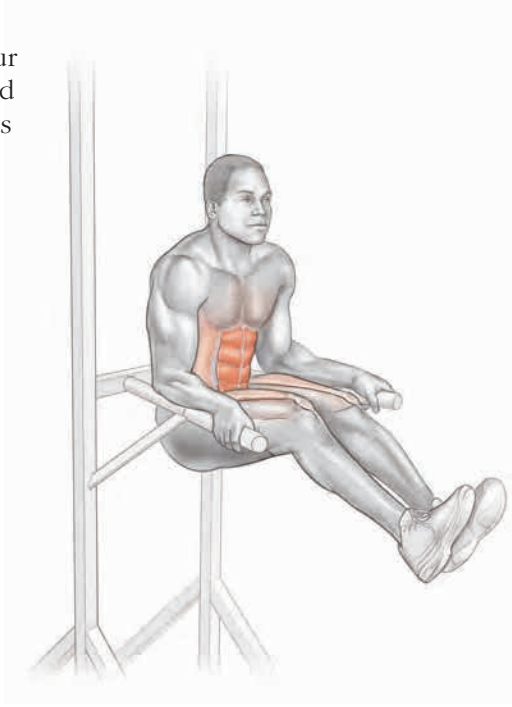
Trajectory: As you raise your legs, lift your pelvis to maximize contraction in the lower abdominals.

Resistance: This exercise is harder if you try to keep your legs straight. The more you bend your knees, the easier the exercise becomes.

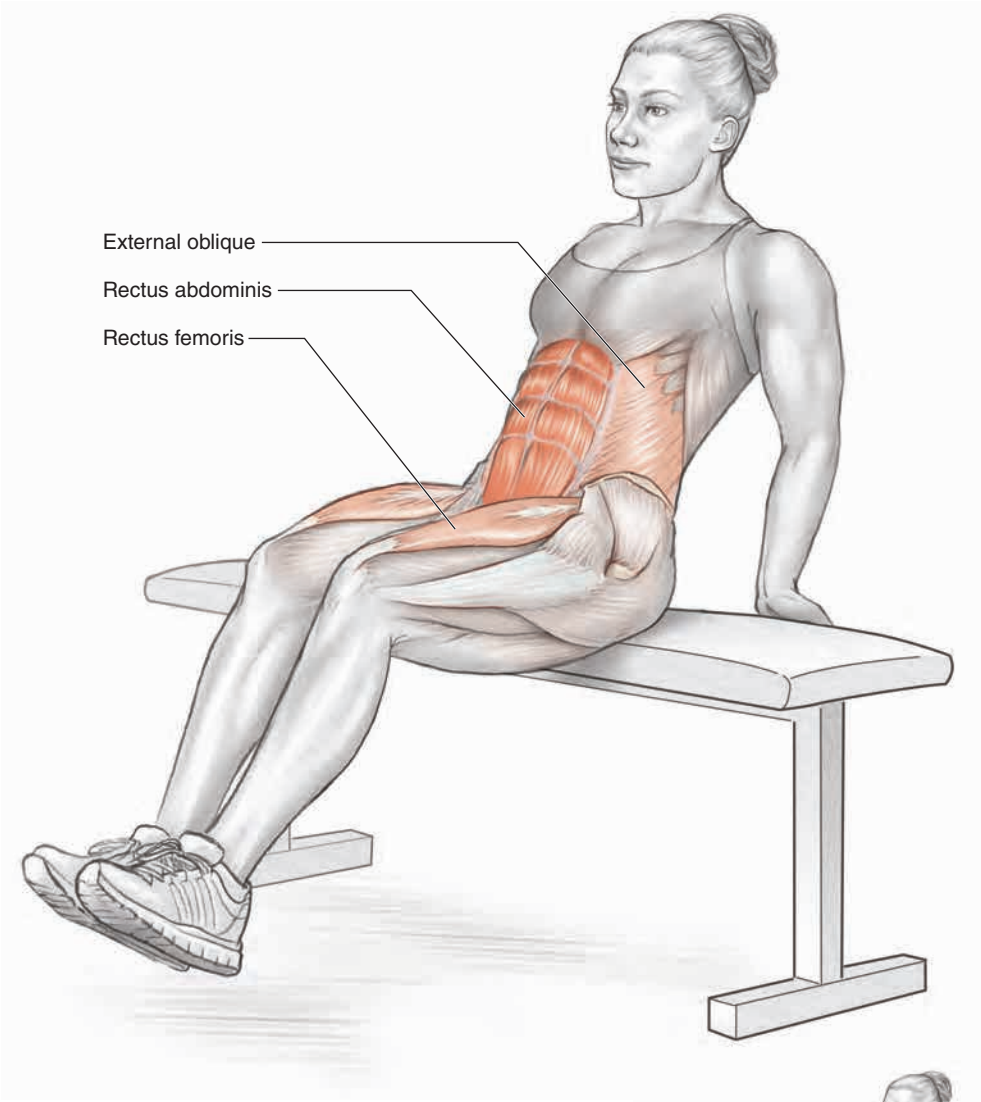
VARIATION

Vertical Leg Raise

On the vertical leg raise apparatus, your back is supported against a backrest and your elbows rest on pads. This prevents your legs and torso from swinging.



KNEE-UP





End position.

Execution

1. Sit on the edge of a flat, secure bench, legs hanging down and knees slightly bent. Grip the bench behind you.
2. Raise your knees toward your chest, keeping your legs together.
3. Lower your legs until your heels almost touch the floor.

Muscles Involved

Primary: Rectus abdominis

Secondary: External oblique, internal oblique, iliopsoas, rectus femoris

Anatomic Focus

Hand position: Grasp the bench behind your hips for support.

Foot position: Keep your feet together and your knees slightly bent.

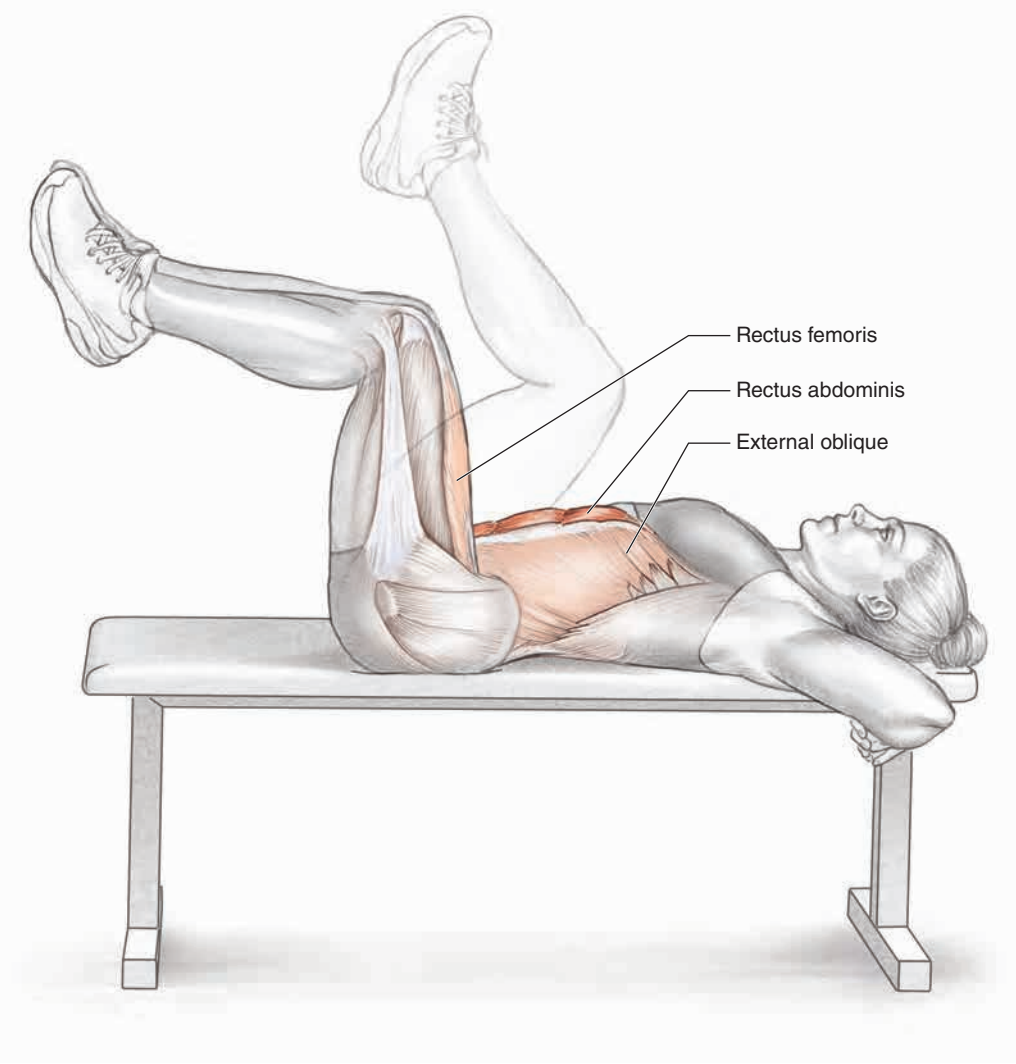
Body position: Lean back slightly so that your torso makes a 45- to 60-degree angle with the bench. You may rest your feet on the floor for stability while getting into position.

Range of motion: Raise your knees until your thighs almost touch your abdomen. As you lower your legs, stop before your heels make contact with the floor to keep tension on the muscles.

Trajectory: Leaning your torso back allows you to increase the range of motion.

Resistance: Hold a small dumbbell between your ankles to add resistance.

REVERSE CRUNCH



Execution

1. Lie on a flat, secure bench and position your feet so that your knees and hips are bent 90 degrees. Grasp the bench behind your head for support.
2. Lift your pelvis off the bench until your feet point to the ceiling.
3. Lower your legs to the starting position.

Muscles Involved

Primary: Rectus abdominis

Secondary: External oblique, internal oblique, hip flexors (iliopsoas, rectus femoris)

Anatomic Focus

Hand position: Put your hands behind your head and grasp the bench for support.

Foot position: In the starting position, your thighs should be vertical and your lower legs should be parallel to the bench so that you have a 90-degree bend at your knees and hips. Keep your feet and legs together.

Body position: Keep your upper torso in contact with the bench.

Range of motion: Contract your lower abs to lift your pelvis off the bench, raising your legs until your toes point to the ceiling.

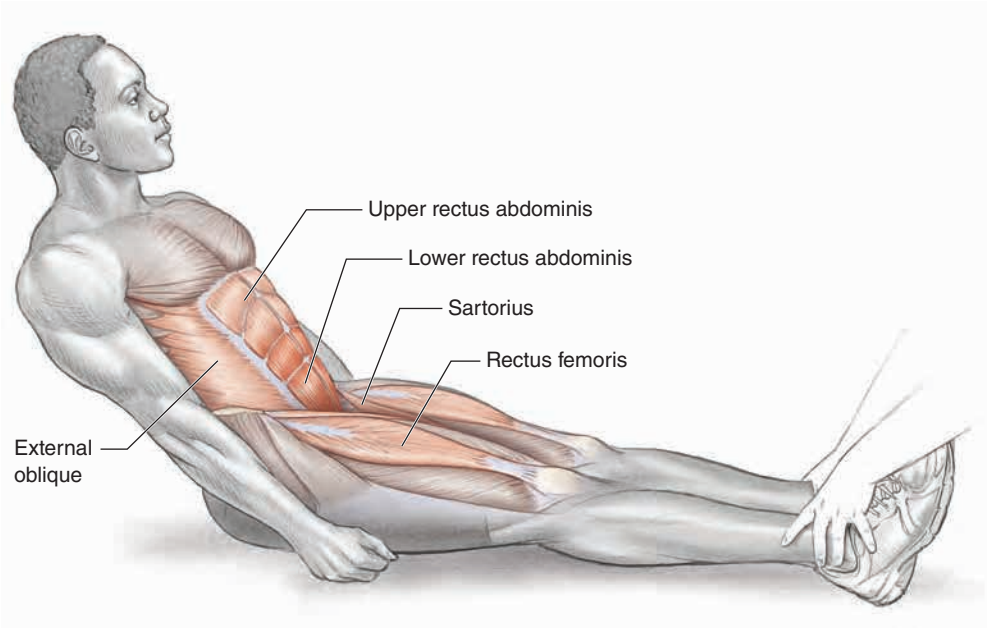
Safety tip: If you have difficulty balancing on a bench, you can perform this exercise while lying on the floor.

VARIATION

Hip Flexor Machine

On hip flexor machines, resistance provided by the machine is transmitted via a strap across your lower thighs.

STRAIGHT-LEG SIT-UP



Execution

1. Lie flat on the floor with your legs straight, feet secured, and arms at your sides.
2. Keeping your back straight, raise your torso off the floor until your hands touch your knees. Your hands will slide along your thighs.
3. Lower your torso to the starting position.

Muscles Involved

Primary: Lower rectus abdominis

Secondary: External oblique, internal oblique, upper rectus abdominis, hip flexors (sartorius, iliopsoas, rectus femoris)

Anatomic Focus

Range of motion: Raise your torso off of the floor, keeping your spine straight. Your shoulders should rise about 6 to 12 inches (15-30 cm) off the floor or until your hands touch your knees. The motion occurs at the waist and hips in contrast to crunches, where movement occurs at the upper spine.

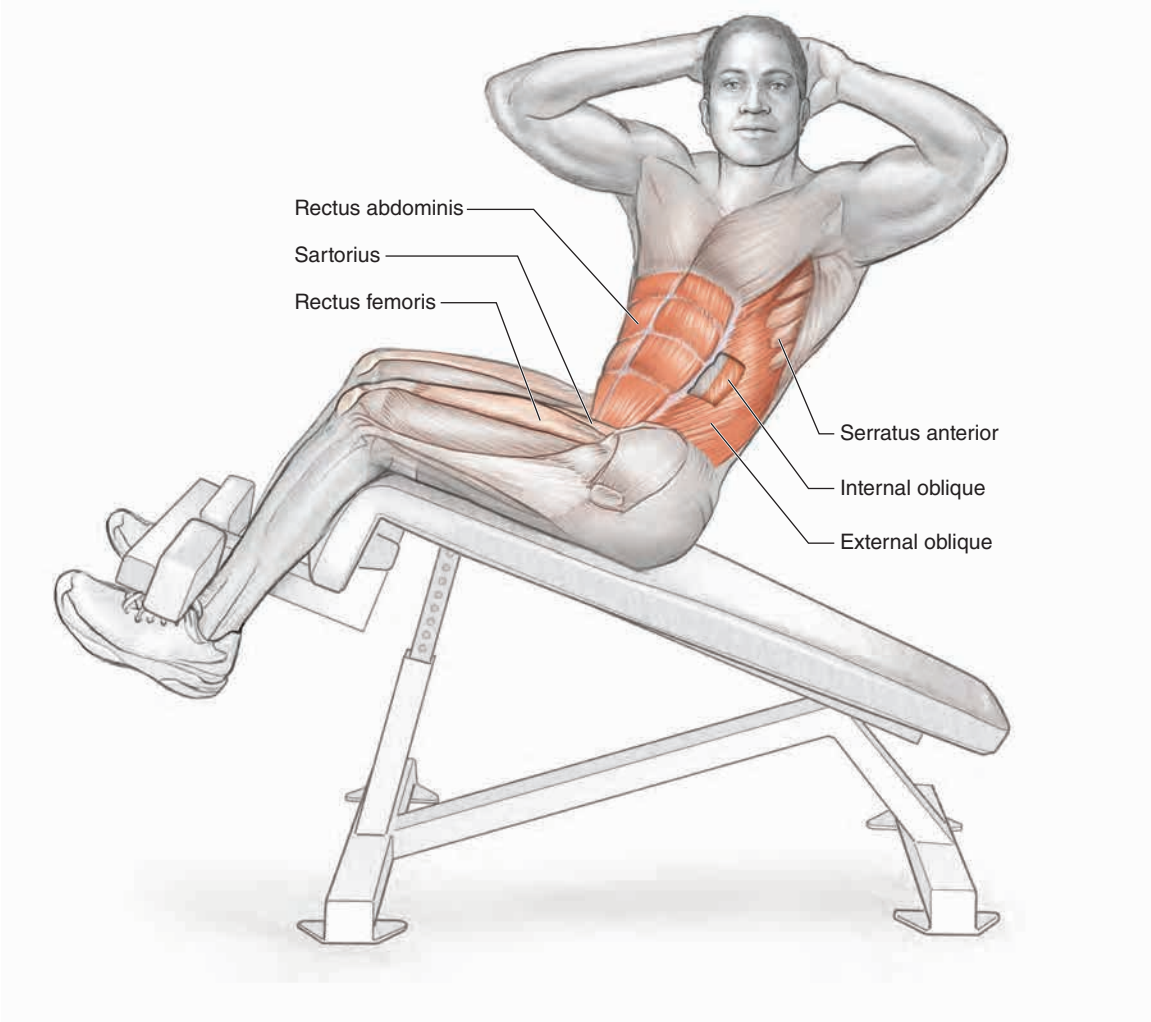
Body position: Keep your legs straight. The backs of your knees and your heels should be in contact with the floor throughout the movement.

Foot position: Secure your feet under a roller pad or comparable support. As an alternative, have a partner hold your ankles.

Hand position: Keeping your arms out straight, your hands should slide along your thighs. Terminating the motion when your hands touch your knees keeps focus on the lower abdominal muscles.

Resistance: You can increase the degree of difficulty by placing your hands behind your head or by holding a weight to your chest.

TWISTING SIT-UP



Execution

1. Sit on a decline bench, hook your feet under the pad, lean back, and position your hands behind your head.
2. As you sit up, twist your torso, directing your right elbow toward your left knee.
3. Lower back down to the starting position. During the next repetition, direct your left elbow toward your right knee.

Muscles Involved

Primary: Rectus abdominis, external oblique, internal oblique

Secondary: Serratus anterior, hip flexors (sartorius, iliopsoas, rectus femoris)

Anatomic Focus

Hand position: Position your hands behind your head.

Foot position: Secure your feet under a roller pad or comparable support.

Body position: Keep your knees bent to reduce stress on the lower back.

Range of motion: Your torso should be vertically upright in the top position, with one elbow almost touching the opposite knee. Lower your torso until almost parallel to the floor, about three-quarters of the way down. If you lean back too far, tension is released from the abdominal muscles and more stress is placed on the lower back.

Trajectory: Tilting the bench at a steeper angle makes the exercise harder.

Resistance: Increase resistance by tilting the bench at a steeper incline or holding a small weight plate behind your head.

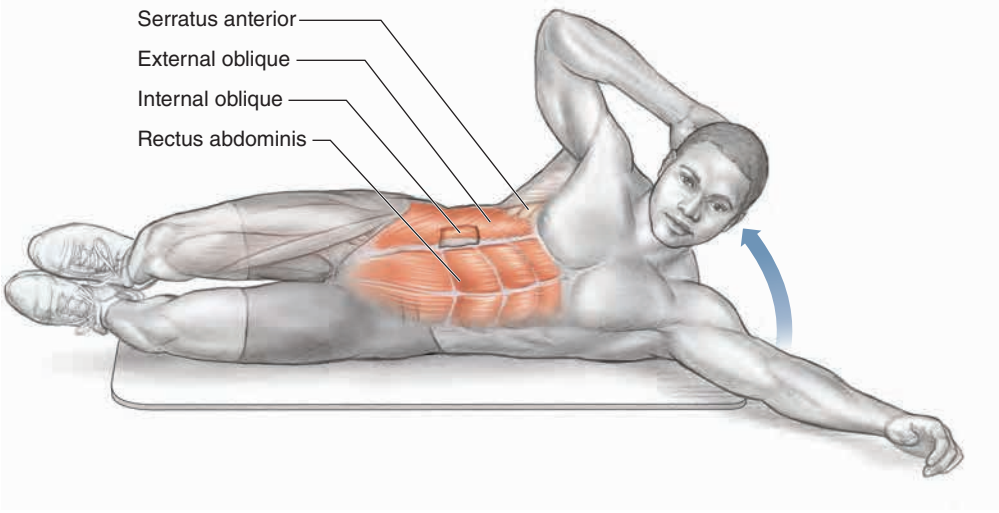
VARIATION

Broomstick Twist

Sit upright on the edge of a flat bench and hold a broomstick behind your neck. Twist your upper body from side to side. When you twist to the right, feel the right oblique muscles contract, and vice versa.



OBLIQUE CRUNCH



Execution

1. Lie on your left side with your knees bent and together and your right hand behind your head.
2. Slowly lift your upper body by contracting the obliques on your right side.
3. Lower your torso back down.

Muscles Involved

Primary: External oblique, internal oblique, rectus abdominis

Secondary: Serratus anterior

Anatomic Focus

Hand position: Place your upper-side hand behind your head and rest the other hand out to the side or over your knee for balance. Do not pull your neck up with your hand.

Foot position: Position your feet so that your knees and hips are bent almost 90 degrees. Keep your legs together.

Body position: Lie on your left side to work the right obliques and then switch to your right side to work the left obliques. Perform this exercise on a cushioned exercise mat placed on the floor.

Range of motion: Crunch your torso 30 to 45 degrees upward from the floor.

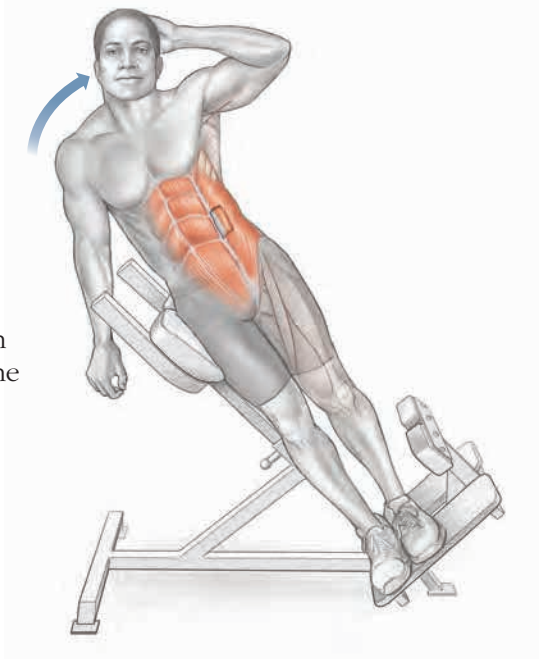
VARIATIONS

Incline Oblique Crunch

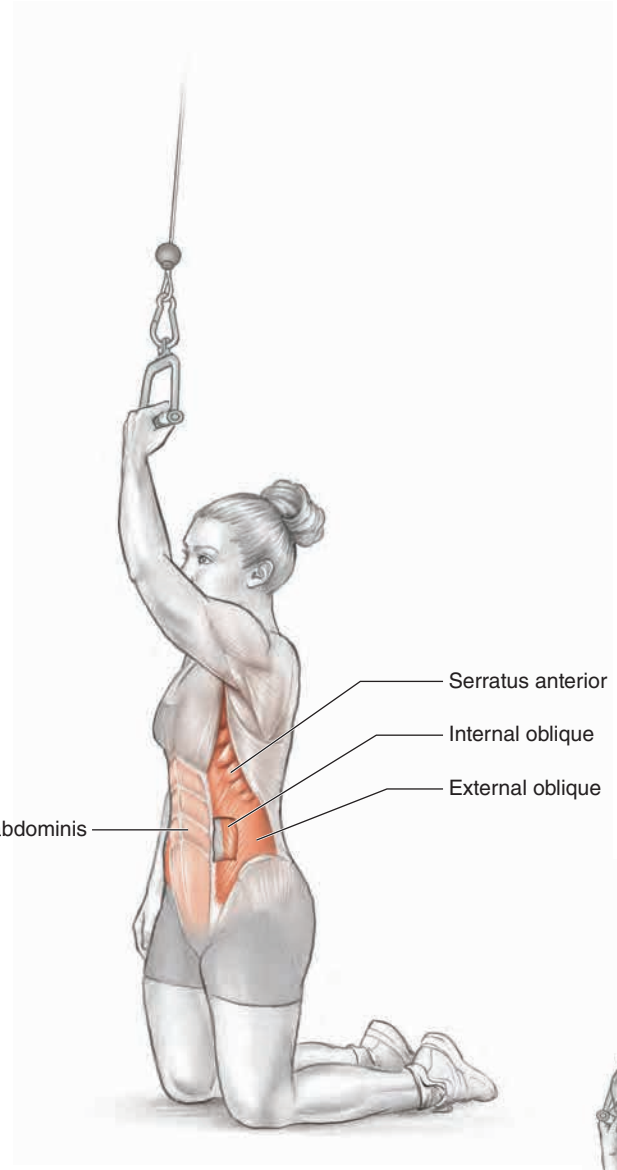
Use an incline abdominal chair. Secure your feet on the support platform and lean back sideways into the seat, resting on one buttock only. Place your uppermost hand behind your head and crunch your torso upward.

Machine Oblique Crunch

Perform this exercise while sitting obliquely (on one buttock at a time) in the seat of a crunch machine, working one side at a time.



CABLE OBLIQUE CRUNCH





End position.

Execution

1. Grab a D-handle attached to the high pulley of a cable machine.
2. Crunch downward, directing your elbow toward the opposite knee.
3. Slowly return to the starting position.

Muscles Involved

Primary: External oblique, internal oblique, serratus anterior

Secondary: Rectus abdominis

Anatomic Focus

Hand position: Grasp the handle above or alongside your head.

Foot position: You may perform this exercise while standing, kneeling, or sitting.

Body position: You may perform this exercise while facing either toward or away from the weight stack, depending on personal preference.

Range of motion: Your torso should move from the upright position to almost parallel to the floor.

Resistance: Alter resistance by adjusting the weight stack.

VARIATIONS

Cable Standing Oblique Crunch

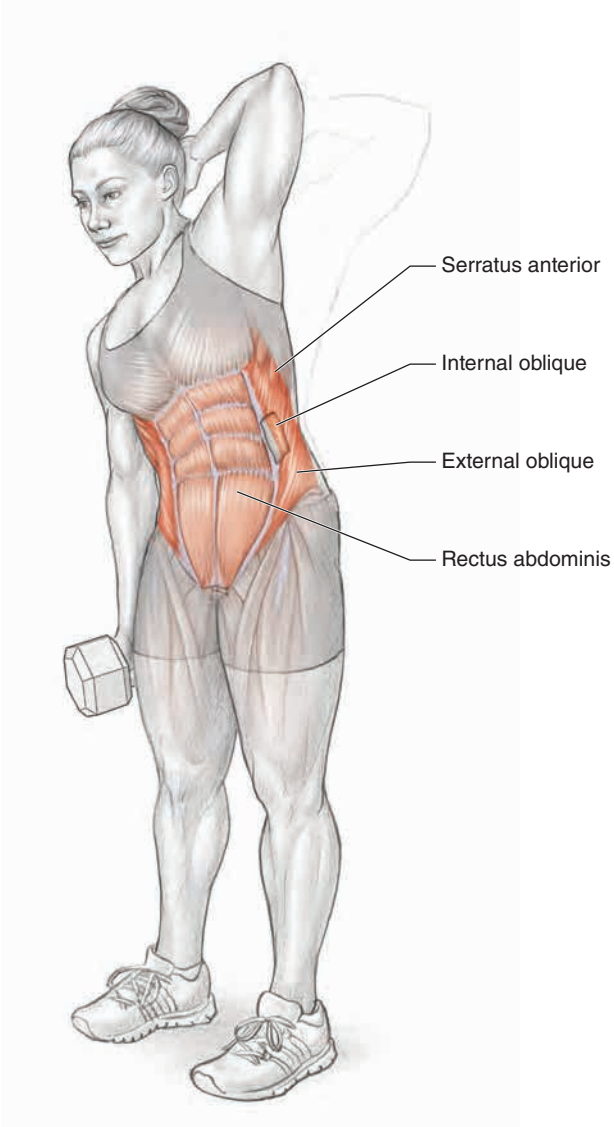
Standing side-on to the weight stack, grab the D-handle attached to a high pulley with your nearside hand. Crunch downward, directing your elbow to the hip on the same side.

Rope Oblique Crunch

Holding the rope attachment with both hands, crunch with a twist to one side and then the other. This motion, which works the obliques, is similar to that used during twisting sit-ups.



DUMBBELL SIDE BEND



Execution

1. Standing upright, hold a dumbbell in your right hand and place your left hand behind your head.
2. Bend your torso to the right, lowering the dumbbell toward your knee.
3. Straighten your torso back up to the starting position, contracting the left oblique muscles.

Muscles Involved

Primary: External oblique, internal oblique, serratus anterior

Secondary: Rectus abdominis, quadratus lumborum

Anatomic Focus

Hand position: Hold a dumbbell at arm's length by your side in one hand and place the other hand behind your head.

Foot position: Stand with your feet hip-width apart.

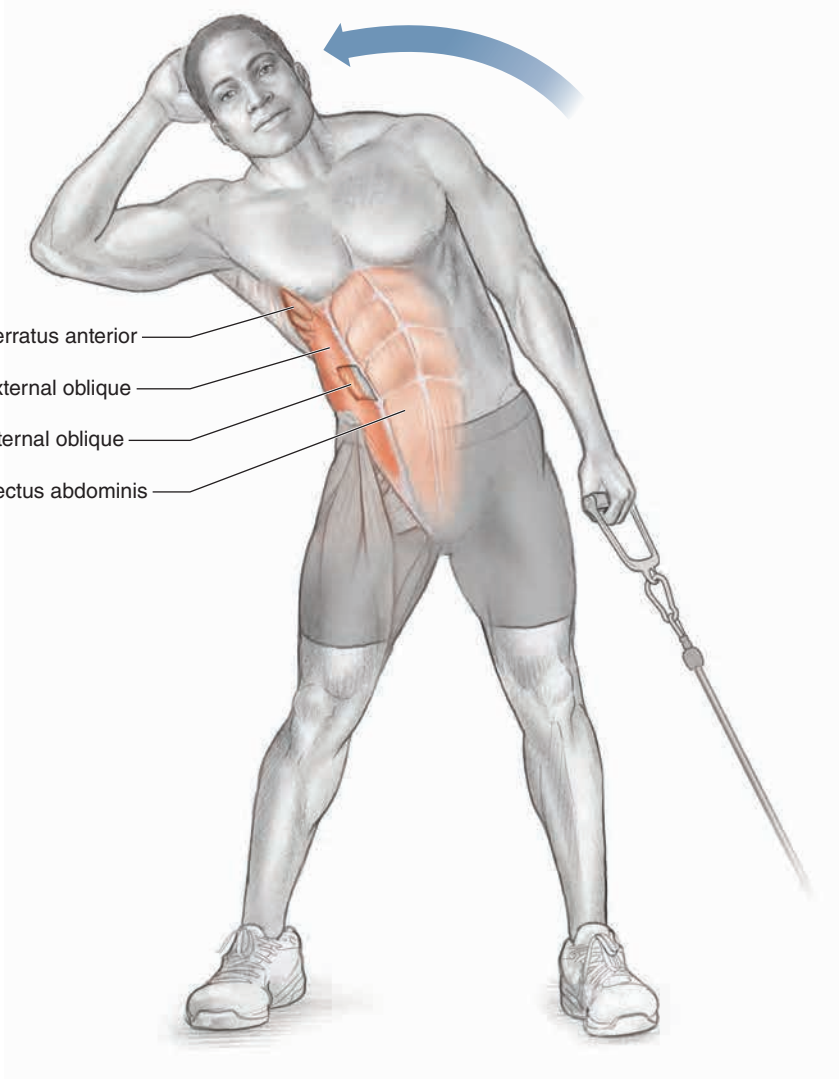
Body position: When you bend to the right side, you work the left obliques, and vice versa.

Range of motion: Your torso should bend approximately 45 degrees or until the dumbbell becomes level with your knee.

Trajectory: Your torso should move directly sideways without leaning to the front or the back.

Resistance: Avoid using a heavy dumbbell for this exercise. Large, overdeveloped oblique muscles will make your waist appear bulky.

CABLE SIDE BEND



Execution

1. Standing upright, hold a D-handle attached to the low pulley of a cable machine in your left hand.
2. With your right hand behind your head, bend your torso to the right side, contracting your right oblique muscles.
3. Straighten your torso back up to the starting position.

Muscles Involved

Primary: External oblique, internal oblique, serratus anterior

Secondary: Rectus abdominis, quadratus lumborum

Anatomic Focus

Hand position: Hold the D-handle attached to the low pulley at arm's length in one hand and place your other hand behind your head.

Foot position: Stand with your feet slightly wider than your hips. The position of your legs and arms should resemble a four-pointed star.

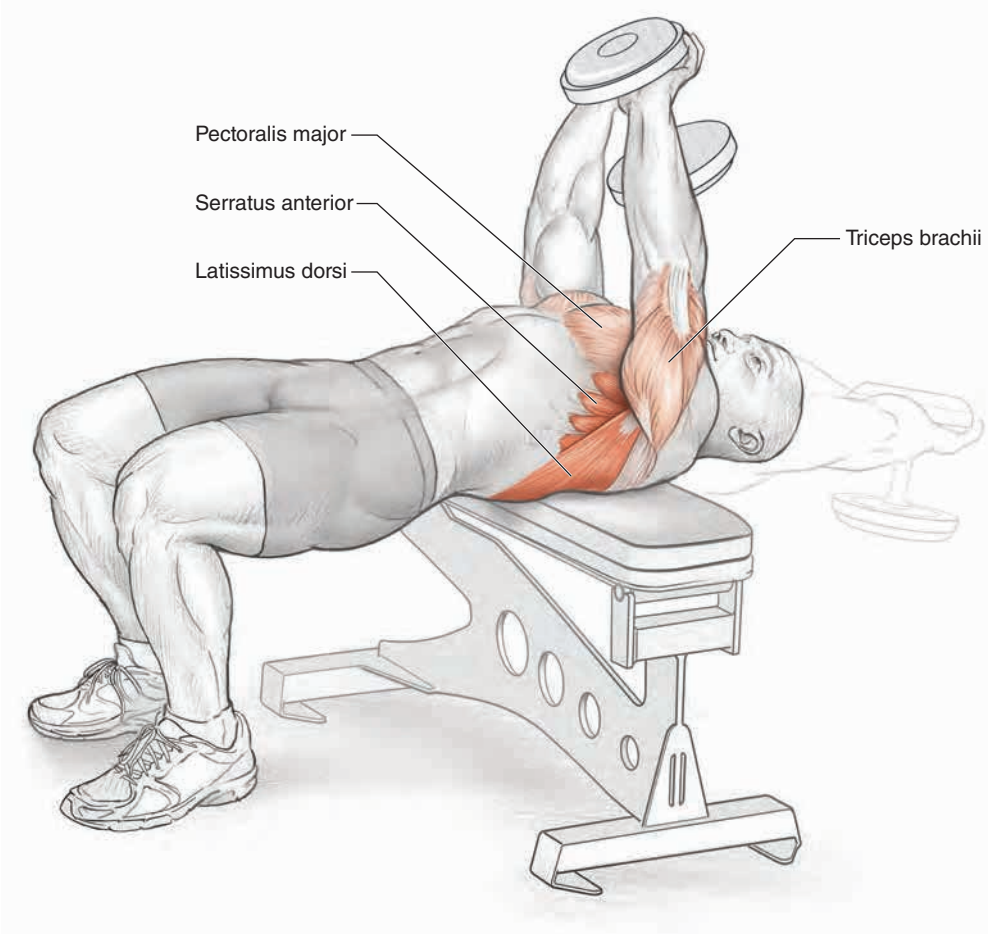
Body position: Stand sufficiently away from the pulley so that the gripping arm remains outstretched. When you hold the weight in your right hand you work the left oblique muscles, and vice versa.

Range of motion: Your torso should bend sideways back and forth through approximately 60 degrees, or between 10 and 2 o'clock when looking in a mirror. You may bend toward the weight stack to stretch the oblique before contracting the muscle in the opposite direction.

Trajectory: Your torso should move directly sideways without leaning forward or backward.

Resistance: Adjust the resistance on the weight stack according to your ability. Use caution with heavier weights, as overdeveloped oblique muscles will make your waist appear bulky.

DUMBBELL PULLOVER



Execution

1. Lie with your upper back resting across a flat bench. Hold a dumbbell straight above your chest.
2. Lower the dumbbell down and back until it reaches bench level, inhaling deeply and stretching your rib cage as you do so.
3. Pull the weight back up to the vertical position, exhaling as you do so.

Muscles Involved

Primary: Serratus anterior, intercostals, latissimus dorsi

Secondary: Pectoralis major, pectoralis minor, triceps brachii

TIP *This exercise strengthens the serratus anterior but doesn't directly target the obliques. However, it is included in this section because the serratus anterior is worked during most oblique exercises.*

Anatomic Focus

Grip: Hold the dumbbell by placing your palms against the inside of the weight plate at one end, making a diamond shape around the bar with your thumbs and index fingers.

Body position: Your torso should remain still and parallel to the floor, with your upper back resting on the bench and your feet firm on the floor for stability.

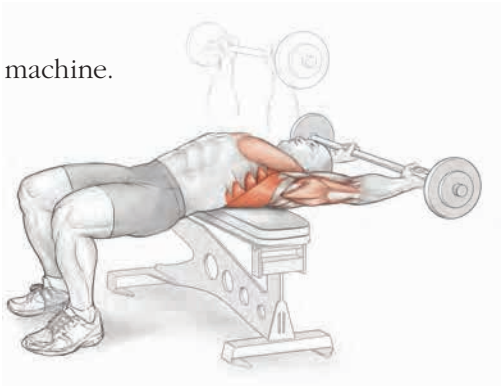
Range of motion: Move the dumbbell through an arc of about 90 degrees. Aim for a full stretch in your rib cage as you lower the weight.

Resistance: Do not use a heavy weight because the shoulder joint is vulnerable to injury during this exercise.

VARIATION

Barbell or Machine Pullover

Perform this exercise using a barbell or a machine.



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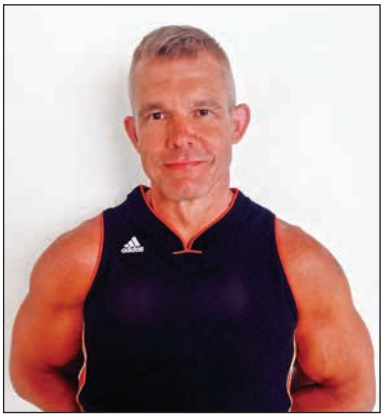
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ABOUT THE AUTHOR



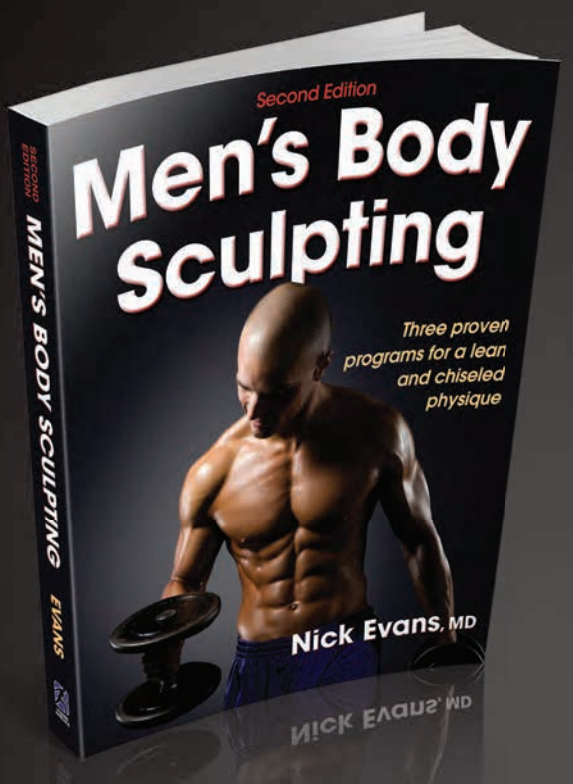
Nick Evans, BSc, MD, FRCS (Orth), is an orthopedic surgeon specializing in sport injury. He studied medicine at the University of London, England, and trained in orthopedic surgery at the University Hospital of Wales. Evans gained additional skills in arthroscopic surgery at the Southern California Center for Sports Medicine and the University of California at Los Angeles.

Evans is a highly regarded authority on strength training, nutrition, and weight training injuries. He is an expert on musculoskeletal anatomy and has written for numerous scientific publications. Evans is the author of the book ***Men's Body Sculpting*** and was a regular columnist for ***MuscleMag International*** and ***Oxygen Women's Fitness*** magazines. He is also featured in several instructional DVDs on weight training.

Evans practices and resides in North Yorkshire, England.

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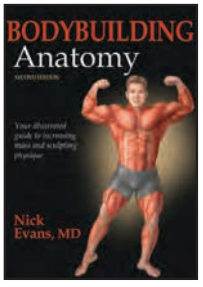
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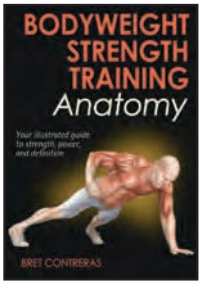
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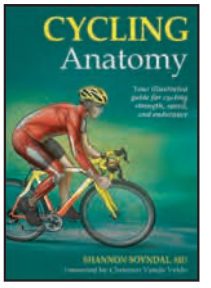
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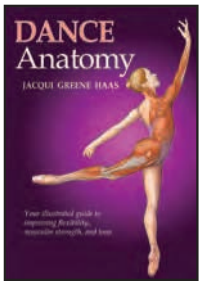
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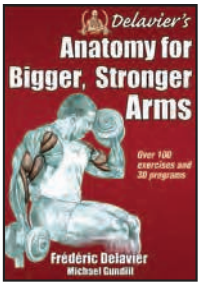
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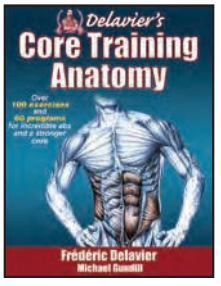


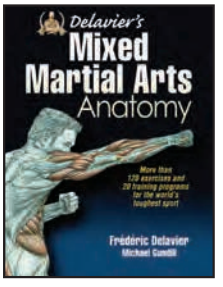


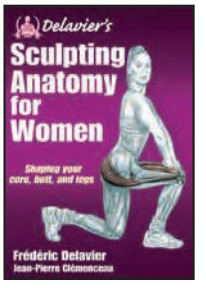


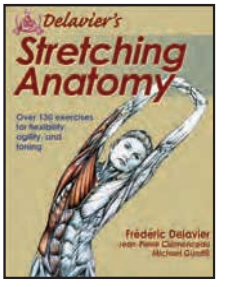


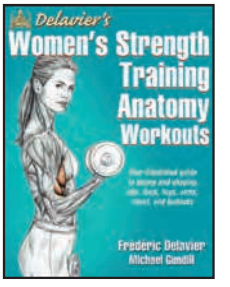


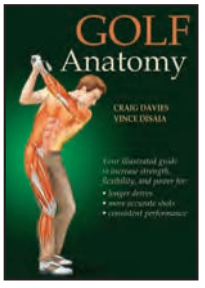


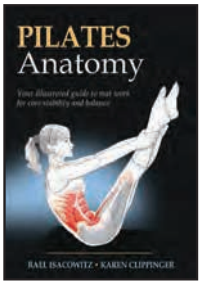


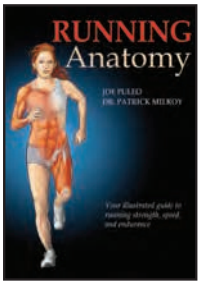


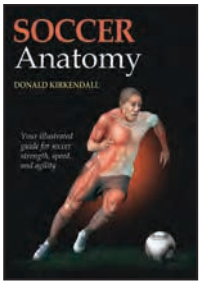


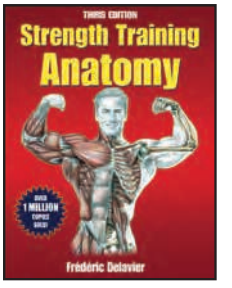


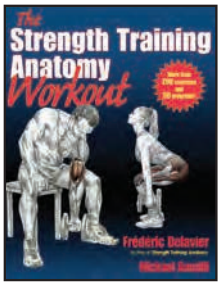


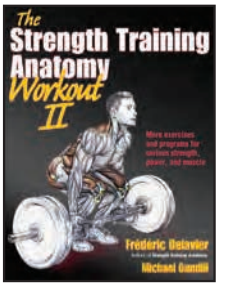


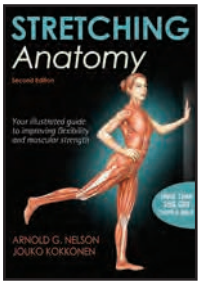


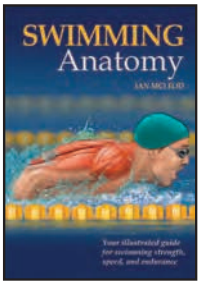


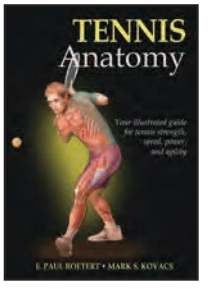












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