CONTENTS

1. ARMS .................................................. 1
2. SHOULDERS ........................................... 23
3. CHEST .................................................. 41
4. BACK ................................................... 57
5. LEGS ..................................................... 78
6. BUTTOCKS ............................................. 98
7. ABDOMEN ............................................... 108
1. Curls
2. Concentration Curls
3. Hammer Curls
4. Low Pulley Curls
5. High Pulley Curls
6. Barbell Curl
7. Machine Curls
8. Pracher Curls
9. Reverse Curls
10. Reverse Wrist Curls
11. Wrist Curls
12. Pushdowns
13. Reverse Pushdowns
14. One-Arm Reverse Pushdowns
15. Triceps Extensions
16. Dumbbell Triceps Extensions
17. One-Arm Dumbbell Triceps Extensions
18. Seated Dumbbell Triceps Extensions
19. Seated EZ-Bar Triceps Extensions
20. Triceps Kickbacks
21. Triceps Dips
1 Curls

Sit on a bench holding a dumbbell in each hand with your palms facing inward.
- Inhale and raise one arm at a time, turning the palm up.
- Raise your elbows to continue curling the dumbbell.

This exercise involves the brachialis, brachioradialis, biceps, anterior deltoideus, and, to a lesser extent, the triceps brachii and upper pecs.

Note: Biomechanically, this exercise is excellent for emphasizing the biceps in all its actions (flexion and pronation of the arm and supination).
CONCENTRATION CURLS

Sit on a bench. Hold a dumbbell with an underhand grip and rest your elbow on the inner side of your thigh.
- Inhale and curl the dumbbell.
- Exhale as you complete the movement.

This isolation exercise allows you to control the range, speed, and alignment of the movement. It works mainly the biceps, brachialis, and brachioradialis.
Hammer Curls

Stand or sit. Grasp a dumbbell in each hand with your palms facing inward.

- INHALE and curl the dumbbells to your shoulders, either simultaneously or alternately.
- Exhale as you complete the movement.

This is the best exercise for the brachioradialis. It also works the biceps and develops the brachialis.
LOW PULLEY CURLS

Stand facing the machine and grasp the handle with an underhand grip. - Inhale and curl the pulley handle. - Exhale as you complete the movement. This is a good exercise for isolating and strengthening the biceps.
HIGH PULLEY CURLS

Stand between the pulleys, spread your arms, and grasp the high pulley handles with an overhand grip:
- While and curl the biceps toward your head
- Ensure you complete the movement

This exercise is mostly used to complete a workout focusing on arm development. It works the biceps, particularly the long head, which is first stretched and loaded while your arms are spread. This exercise also works the brachialis.

Start with a weight that is manageable. Concentrate on feeling the proper contraction along the medial part of the biceps.

With an overhand grip, the distal tendon of the biceps is firmly wrapped around the radius.

When you contract the biceps, the force exerted on its distal tendon rotates the radius around its axis, bringing the hand to a supinated position.

Note: the biceps not only flexes the arm, but it is also the most powerful supinator.
This exercise mainly works the biceps, triceps, and, to a lesser extent, the shoulder girdle, pronator teres, and all the flexors of the wrist and fingers.

**Variations:**
1. By using various grip widths to more intensely work
   - the biceps short head (wide grip)
   - the biceps long head (narrow grip)

2. Lift your elbows at the end of the curl to get a better biceps contraction and to involve the anterior deltoids.

3. To make this movement more rigorous and controlled, place your back against a wall and keep your scapular shoulder blades pressed against the wall.
MACHINE CURLS

This is one of the best exercises to test the action of the biceps. This movement also works the brachialis and, to a lesser extent, the brachioradialis and pronator teres. It is impossible to cheat because your arms are firmly held on the table. The muscular tension is intense at the beginning, so warm up by using light loads. Avoid tendencies by keeping your arms from extending completely.

Sit and take an underhand grip on the bar with your arms straight and your elbows resting on the padded and angled surface of the table:

- Inhale and curl the bar
- Exhale as you complete the movement
Stand or sit with your arms resting on the bench.
- Inhale, and curl the bar
- Exhale as you complete the movement

This is one of the best isolation exercises for the biceps.

**Warning:** the angle of the bench creates significant tension in your arms when they are fully extended. Remember to warm up your muscles correctly and to begin with moderate weight.
REVERSE CURLS

Stand with your feet slightly apart and your arms straight, using an overhand grip (thumbs toward each other).

1. Inhale and curl the bar.
2. Exhale as you complete the movement.

This exercise works the extension of the wrist and fingers. It works the brachioradialis, brachialis, and, to a lesser degree, the biceps.

Note: This is an excellent warm-up for strengthening the wrist joint. The prominence of the wrist extensions over the wrist extensions often causes imbalance and strain on the wrist. For this reason, this exercise has been integrated into many heavy-training programs. Many bench press champions use it to prevent their wrists from shaking when using heavy weight.
Sit with your forearms resting on your thighs or on a bench. Take an overhand grip on the bar with your wrists passively flexed.
- Curl your wrists back toward you
- Return to the starting position

This exercise works the wrist and finger extensors.

Note: this is an excellent movement for strengthening the wrist, which is often weak because of a lack of strength in the extensor muscles.
Wrist Curls

**ACTION**

Sit with your forearms resting on your thighs or on a bench. Take an underhand grip on the bar with your wrists painlessly extended.

- Inhale and curl your wrists.
- Exhale as you complete the movement.

**VARIAION WITH SPECIFIC MACHINE** Beginnig position.

This exercise works the flexors of the wrist and fingers. The flexors of the fingers, although simple, situated, are the largest of the flexor muscles.
PUSHDOWNS

Stand facing the machine with your hands on the bar and your elbows against your sides.
- Inhale and let your arms hang naturally.
- Exhale as you pull the arm strength.

This isolation exercise works the biceps and the triceps.
You can perform an effective variation of this movement with a pole instead of the bar to work the lateral head of the biceps more intensely. Use an underhand grip to place emphasis on the medial head of the triceps.
At the end of the movement, hold a position contraction for one or two seconds to load the effort more intensely.
If you are a heavy weight, lean slightly forward at the waist for more stability.
This exercise is very easy to perform and can be done by beginners to help develop strength before moving on to more difficult exercises.
REVERSE PUSHDOWNS

Stand facing the machine with your hands on the bar and elbows lined up against your sides.
- Inhale and straighten your arms, don’t separate your elbows from your sides.
- Exhale as you complete the movement.

The underhand grip doesn’t allow you to work with a heavy weight. Perform the exercise with a light weight in order to work the triceps and focus on the medial head. The bicep extension also works the anconeus and the wrist extensors. The wrist extension and ulnar stabilize the extensors contracting isometrically during the action.
Stand facing the machine and grasp the handle with an underhand grip:
- Inhale and straighten your arm.
- Exhale as you complete the movement.

This exercise works the triceps.
TRICEPS EXTENSIONS

**Muscles Involved:**
- Triceps brachii, medial head
- Triceps brachii, long head
- Biceps brachii
- Elbow flexors
- Forearm flexors
- Forearm extensors
- Forearm pronators
- Forearm supinators
- Brachioradialis
- Pronator teres
- Flexor carpi ulnaris
- Flexor digitorum superficialis
- Flexor carpi radialis
- Flexor digitorum profundus
- Flexor pollicis longus
- Brachialis
- Coracobrachialis
- Teres major
- Supraspinatus
- Latissimus dorsi
- Seratus anterior

**Instructions:**

1. Lie on a flat bench and take an overhead grip on the bar with your arms extended.
2. Inhale and bend your elbows, making sure you don't allow them to flare to the sides.
3. Return to the starting position, exhaling as you complete the movement.

This fundamental movement is excellent for developing large triceps.
LIE on a flat bench holding a dumbbell in each hand with your arms extended straight up from your shoulders.

- INHALE and slowly bend your arms
- RETURN to the starting position, exhale as you complete the movement.
ONE-ARM DUMBBELL TRICEPS EXTENSIONS

Stand up holding a dumbbell in one hand with your arm extended straight.
- Inhale and bend your elbow to lower the dumbbell behind your neck.
- Return to the starting position, exhaling as you complete the movement.

Note the upright position of the arm stretches the long head of the triceps, increasing in contraction in the repeat.

**Muscles Involved:**
- Triceps brachii long head
- Triceps brachii lateral head
- Triceps brachii medial head
- Biceps brachii long head
- Brachialis
- Biceps brachii short head
- Brachioradialis
- Pronator teres
- Extensor digiti minimi
- Extensor digiti
- Extensor carpi radialis brevis
- Extensor carpi radialis longus
- Anconeus
- Brachioradialis
- Biceps brachii
- Brachialis
- Triceps brachii, lateral head
- Triceps brachii, long head
- Deltoideus
- Triceps major
- Latissimus dorsi
- Obliquus externus abdominis

**Muscles Acted Upon:**
- Spine erector
- Spinous process
- Clavicle
- Acromion
- Scapula
- Lateral epicondyle
- Olecranon
- Median nerve
- Median nerve
SEATED DUMBBELL TRICEPS EXTENSIONS

Sit holding the dumbbell in both hands behind your neck:
- Inhale and extend your arms straight until they are above your head.
- Exhale as you complete the movement.

The vertical position of the arms greatly stretches the long head, which helps work this region.
It is important to contract your abdominal muscles to avoid arching your back. If possible, use a bench with a short back for support.

18
**SEATED EZ-BAR TRICEPS EXTENSIONS**

**ACTION**

1. Stand or sit, taking an overhand grip on the bar with your arms extended forward.
2. Inhale and bend your elbows to lower the bar behind your neck.
3. Exhale as you complete the extension.

The vertical position of the arms intensively stretches the triceps long head allowing you to work it extensively. The overhand grip helps to work the lateral head of the triceps.

For safety reasons, do not arch your back. If possible, use a bench with a short back for support.
**TRICEPS KICKBACKS**

Stand with your knees slightly bend, bending forward at the waist, and keeping your back straight. Press your upper arm against your side. Bend your arm at a 90-degree angle:
- Inhale as you complete the movement.

This exercise is excellent for pumping the entire triceps group. For a better result, you can do this movement until you feel the burning sensation in your muscles.
Place your hands on the edge of a flat bench and rest your feet on another bench. Assume a knee-leg angle of about 90 degrees.

- Inhale and bend your arms.
- Straighten your arms to return to the starting point, exhaling as you complete the movement.

This exercise works the triceps, pectoralis, and anterior deltoids.

Placing a weight on your hips increases the difficulty and intensifies the effort.
1. Back Press
2. Front Press
3. Dumbbell Press
4. One-Arm Dumbbell Press
5. Lateral Raises
6. Bent-Over Lateral Raises
7. Front Raises
8. Side-Lying Lateral Raises
9. Low Pulley Lateral Raises
10. Low Pulley Front Raises
11. Low Pulley Bent-Over Lateral Raises
12. One-Dumbbell Front Raises
13. Barbell Front Raises
14. Upright Rows
15. Nautilus Lateral Raises
16. Pec Deck Rear Delt Laterals
Sit on a bench with your back straight. Grasp a barbell with an overhand grip and rest the barbell across your shoulders behind your neck:

- Inhale and press the barbell directly above your head without arching your back
- Exhale as you complete the movement

This exercise works the deltoids, particularly the medial part, and the upper trapezius, triceps, and serratus anterior. It also works the biceps, infraspinatus, teres minor, and supraspinatus. You can also perform this movement while standing or by setting the bar on a rack. There are many machines that allow you to do this exercise with less concentration on form and safety.

Note: To avoid traumatizing the shoulder joint, which is particularly delicate, rest the bar higher or lower behind your neck according to your body type and flexibility. This exercise can be strenuous on the middle calf muscles and should be performed with caution.
Sit with your back straight. Take an overhand grip on the barbell and rest it on your upper chest:
- While and extend the barbell straight up
- Inhale at the top of the movement

This basic exercise works the following muscles:
- Anterior delts and medials
- Upper pectorals
- Upper triceps
- Biceps
- Serratus anterior

You can perform this exercise while standing, but you must avoid hyperextension of the spine.

Place your elbows slightly forward for more work on the anterior delts and to involve the medial deltoids more intensely. flare out your elbows. Many machines and racks allow you to perform this movement with less concentration on the correct position, which helps you focus on the deltoids.

**VARIATIONS**
1. Close grip, elbows forward: primarily works the anterior deltoids and triceps
2. Wide grip, elbows forward: primarily works the upper lats and biceps
Sit on a bench with your back straight. Grasp two dumbbells with an overhand grip and lift them to your shoulders, palms facing forward.

- Inhale and press your arms to an extended vertical position
- Exhale as you complete the movement

This exercise uses the deltoids, particularly the medial deltoid, and the upper trapezius, serratus anterior, and triceps.

This movement can also be executed standing and/or with alternating arms. However, the seated version is often used to prevent hyperextension of the spine.
Sit on a bench, grasp the dumbbells with an underhand grip, and lift them to your shoulders.

- Inhale and completely press your arms to an extended vertical position, rotating your wrist so your palms face forward.
- Exhale as you complete the movement.

This exercise focuses on the deltoids, particularly the anterior deltoid, and the upper pectoralis, serratus anterior, and triceps. You can also do this movement:

- Sitting against the back of a seat to avoid extreme hyperextension of the spine.
- Standing erect, or
- Propping the dumbbells simultaneously.
LATERAL RAISES

**ACTION OF THE MUSCLES**

The exercise isolates, almost exclusively, the medial deltoids, which are composed of several separate heads converging on the humerus. They are involved when you hold relatively heavy weight and enable you to move your arms with precision in every plane. It is more effective to raise this muscle by starting at different positions (hands in the way, behind the back, or in front of the shoulder) to involve the medial deltoids completely.

**STARTING POSITION/VARIATIONS**

1. In the sides
2. Behind the back
3. In front of the shoulder
This exercise also works the supraspinatus, located beneath the deltoid muscle in the infraspinatus area of the scapula, and into the humeral large tendons.

Because body types vary, you may find an optimal angle of work that meets your needs. You can try the upper part of the exercise by raising the arms above the horizontal plane. However, many bodybuilders avoid doing this as it places primary emphasis on the medial deltoid.

This exercise is often performed with heavy weights. Sets of 10 to 25 reps give the best results if you vary the angle of work, spend little time recovering, and turn to the point of feeling the burning sensation.

**SHOULDER LATERAL ASPECT**

- **Supraspinatus**
  - Origin: neck of scapula
  - Insertion: greater tuberosity of humerus

- **Infraspinatus**
  - Origin: infraspinous fossa
  - Insertion: greater tuberosity of humerus

- **Teres minor**
  - Origin: lateral aspect of scapula
  - Insertion: greater tuberosity of humerus

**SHOULDER ANTERIOR ASPECT**

- **Pectoralis major**
  - Origin: clavicle, ribs
  - Insertion: humerus

- **Anterolateral muscles**
  - Origin: ribs
  - Insertion: humerus

**SHOULDER POSTERIOR ASPECT**

- **Rotator cuff muscles**
  - Origin: scapula
  - Insertion: humerus

**SHOULDER MEDIAL ASPECT**

- **Serratus anterior**
  - Origin: ribs
  - Insertion: humerus

**SHOULDER INFRASPINOUS ASPECT**

- **Teres major**
  - Origin: scapula
  - Insertion: humerus
**BENT-OVER LATERAL RAISES**

- **Muscles Involved:**
  - **Classical:** Anconaeus, Infraspinatus, Teres minor
  - **Latissimus dorsi
  - Obliquus externus abdominis
  - Teres major
  - **Anterior part:**
    - Biceps brachii
    - Brachialis
    - Brachioradialis
  - **Middle part:**
    - Extensor carpi radialis longus
    - Anconaeus
  - **Posterior part:**
    - Extensor carpi ulnaris
    - Extensor carpi radialis brevis

**Directions of Movement:**

- Stand with your feet shoulder-width apart and your knees slightly bent. Bend forward at the waist and keep your back straight. Hold the dumbbells with your elbows slightly bent.
- Inhale and raise the dumbbells to your sides.
- Exhale as you complete the movement.

**Variation:** You can do this movement lying face down on an incline bench.

**Note:** This exercise works the entire shoulder area, particularly the posterior deltoids. Pinch your scapular shoulder blades together at the end of the movement to involve the middle and lower parts of the trapezius, the rhomboids, teres major, and infraspinatus.
Stand with your feet slightly apart. Hold the dumbbells with your palms down, thumbs and forefingers pointing towards the spine. 

- Inhale and alternate sides, raising the dumbbells forward to shoulder height.
- Exhale as you complete the movement.

This exercise places primary emphasis on the anterior deltoids and upper pecs, and to a lesser extent, on the middle deltoids. Every arm raise exercise also involves the muscles that attach the scapulae (shoulder blades) to the rib cage, such as the serratus anterior and rhomboids, which stabilize the humerus in its movements.
SIDE LYING LATERAL RAISES

Lie on your side on the floor of a bench, holding a dumbbell with an overhand grip.

- Inhale and raise your arm.
- Exhale as you complete the movement.

Unlike standing raises, which gradually work the muscle to maximum intensity at the end of the movement, when you bring your arms to a horizontal position, this exercise involves the deltoids differently, concentrating the effort at the beginning of the movement.

Note: this movement emphasizes the upper deltoids, mainly working at the beginning of the movement. Vary the starting position (dumbbell placed forward, on the thigh, or toward the mat) to place the emphasis on all of the deltoid heads.
LOW PULLEY LATERAL RAISES

This exercise develops the deltoid, particularly the middle part. You should vary the angle of work to stress all the deltoid parts.

Grip the handle with your arm at 90° with - inhale and raise your arm to shoulder height - exhale as you complete the movement.
Stand with your feet slightly spread. Hold the handle with an overhand grip, keeping your arms at your sides.
- Inhale and raise your arms forward to shoulder height
- Exhale as you complete the movement.

This exercise works the delts (particularly the anterior delts) as well as the triceps, biceps, and, to a lesser extent, the front head of the biceps.
Stand with your feet spread and your knees slightly bent. Bend forward at the waist, keeping your back straight and your arms hanging down. Hold a handle in each hand with the cables running each other.

- Inhale and raise your arms to the side until your hands are slightly above the level of your shoulders.
- Exhale as you complete the movement.

This exercise works the deltoids, especially the posterior delts. At the end of the movement, when you pinch your scapula together, you emphasize the trapezius (medial and inferior portions) and the rhomboids.

STANDARDS

LOW PULLEY BENT-OVER LATERAL RAISES

Stand with your feet spread and your knees slightly bent. Bend forward at the waist, keeping your back straight and your arms hanging down. Hold a handle in each hand with the cables running each other.

- Inhale and raise your arms to the side until your hands are slightly above the level of your shoulders.
- Exhale as you complete the movement.

This exercise works the deltoids, especially the posterior delts. At the end of the movement, when you pinch your scapula together, you emphasize the trapezius (medial and inferior portions) and the rhomboids.
ONE-DUMBBELL FRONT RAISES

Start with your feet slightly spread, keep your back straight and your abdominals contracted. Hold the dumbbell, palms facing in, with your hands overlapping each other. Face the dumbbell on your thighs with your arms straight.

- Inhale and raise the dumbbell forward until it reaches shoulder level.
- Exhale as you come to the movement.

This move works the anterior delts as well as the upper pecs and the rear head of the biceps.

All the muscles that stabilize the scapula use isometric action, allowing the humerus to pivot on a stable support.
BARBELL FRONT RAISES

Stand with your legs slightly spread. Take an overhand grip on the barbell and rest the barbell on your thighs. Keep your back straight and your abdominals contracted:
- Inhale and raise the barbell forward with your arms straight until it reaches eye level
- Exhale as you complete the movement.

This exercise works the anterior deltoids, upper trapezius, infraspinatus, and, to a lesser extent, the teres major.

Note: Every third set of this exercise places secondary emphasis on the biceps.
Stand with your feet slightly spread. Keep your back straight. Take an overhand grip on the barbell with your hands slightly more than shoulder-width apart and resting on your thighs.

- Breathe and pull the barbell upward close to your body until it reaches your chest, raising your elbows as high as possible.
- Slowly return to the arm-extended position, avoiding any jerky movements.
- Exhale as you complete the movement.

This exercise directly works the deltoids, trapezius, and biceps, and places secondary emphasis on the forearms, serratus, and abdominal muscles.
Sit on the machine's seat and grasp the handles:

- Inhale and raise your elbows to shoulder level
- Exhale as you complete the movement

This exercise isolates your medial deltoids. It places secondary emphasis on the supraspinatus, infraspinatus, and the subscapularis. If you raise your arms above the horizontal plane, this is an excellent movement for beginners because it requires little effort to correctly position yourself.

**ACTION**
Sit in a pec deck machine facing toward its back support with your arms stretched out grasping the handles.

- Inhale and tense your elbows to the max, pressing your scapulae together at the end of the movement.

Exhale as you complete the movement.

This exercise works:
- the deltoids, particularly the posterior part;
- the infraspinatus and
- the teres minor.

At the end of the movement, when you pinch your scapulae together, it also works:
- the trapezius and
- the rhomboids.
1. Bench Press
2. Close-Grip Bench Press
3. Incline Press
4. Decline Press
5. Push-Ups
6. Parallel Bar Dips
7. Dumbbell Press
8. Dumbbell Flys
9. Incline Dumbbell Press
10. Incline Dumbbell Flys
11. Pec Deck Flys
12. Cable Crossover Flys
13. Dumbbell Pullovers
14. Barbell Pullovers
1 BENCH PRESS

Lie on your back on a flat bench. Keep your buttocks in contact with the bench and your feet flat on the floor.

- Take an overhand grip on the barbell with your hands more than shoulder-width apart.
- Inhale and slowly lower the barbell until it reaches your chest.
- Exhale as you complete the movement.

This exercise focuses on the pecs and places secondary emphasis on the triceps, anterior deltoids, serratus, and coracobrachialis.

Variations:
1. Arch your back to work the more powerful lower pecs and lift heavier loads. However, perform this variation carefully to reduce the likelihood of injury to your back.
2. Press the barbell with your elbows at your sides to focus more on the anterior deltoids.
3. Vary the width of your grip:
   - A narrow grip will focus on the inner pecs.
   - A very wide grip shifts the focus to the outer pecs.
4. Lower the bar:
   - In the lower chest near the edge of the rib cage to work the lower pecs.
   - In the middle of the chest to work the medial pecs.
   - In the upper chest to work the upper pecs.
5. Raise your feet from the floor by curling your legs over your abdomen if you have back problems or if you want to place more emphasis on the pecs.
6. Use a Smith machine.

ACTION

NORMAL BENCH PRESS

Keep your feet flat on the floor for more stability.
**Variation with a machine:**

Stand or sit, depending on the machine, and grasp the bar or the handles.

- Inhale and lower.
- Exhale at the end of the movement.

This base exercise is excellent for beginners. It focuses on the pectorals and keeps your body set in the pronated movement pattern. Beginners can gain strength this way before trying the free weight bench press.

Depending on the type of machine, this exercise allows advanced bodybuilders to isolate the work on the upper, medial, or lower pectorals, helping them develop muscle balance.

---

**Variation among exercises:**

If you wish your back to perform the bench press, your spine must remain motionless. Your weight will always be on the lower back muscle, and you should always maintain in contact with the bench.

Beginners have back problems may avoid this variation.
CLOSE-GRIP BENCH PRESS

Lie on your back on a flat bench, keeping your buttocks in contact with the bench, and your feet flat on the floor. Take an overhead grip on the barbell, with your hands 4 to 13 inches apart, depending on your wrist flexibility.

- Inhale and slowly lower the barbell until it reaches your chest, allowing your elbows to extend away from your torso.
- Push the barbell upward, inhaling as you complete the movement.

This exercise is excellent for developing the pectoralis and the triceps. For this reason, you can include this exercise in an arm-specific program.

Keep your elbows in if you want to shift the emphasis to the anterior deltoids. You can perform this movement with a Smith machine.
INCLINE PRESS

Exercise information:
- Lie on your back on an incline bench set at an angle ranging between 45 and 60 degrees.
- Place an overhand grip on the barbell with your hands more than shoulder-width apart.
- Sit up until the barbell reaches your hips.
- Drive the barbell to your chest at the base of your neck.

Muscles worked:
- Pectoralis major
- Internal oblique
- Biceps brachii
- Brachialis
- Brachioradialis
- Median nerve

Posterior view:
- Semitendinosus
- Semimembranosus
- Sartorius

This exercise targets the upper pectorals, inner obliques, biceps, and semitendinosus. You can use a weight belt to perform this movement.
4 DECLINE PRESS

Lie on a decline bench set at an angle between 20 and 30 degrees with your feet anchored to prevent them from slipping. Take an overhand grip on the bar with your hands at least shoulder-width apart.

- Inhale and slowly lower the bar until it reaches the lower edge of your pectorals.
- Exhale and press the bar back up, exhaling as you complete the movement.

This exercise works the pectoralis major (particularly the lower part), triceps, and anterior delts. It places secondary emphasis on the lower fold of the pectorals. In addition, lowering the bar to neck level helps stretch the pectoralis major, increasing its flexibility.

You can also use a Smith-machine.
Start the exercise with your arms straight, your palms flat on the floor, and your hands shoulder-width apart on the floor. Place your feet shoulder-width apart. Hold your feet together or very slightly apart.

- Inhale and bend your elbows to bring your knees near the floor, avoiding excessive hyperextension of your spine.
- Push yourself back to an arm extended position, exhaling, as you complete the movement.

This exercise is excellent for developing the pectoralis major and the triceps. You can do it anywhere.

- Stay in a neutral spine to isolate the work.
- Elevate the legs to focus on the upper pecs.
- Elevate the torso to focus on the lower pecs.
PARALLEL BAR DIPS

Support yourself with your arms straight and your torso hanging down from your shoulders.

- Inhale and bend your elbows to allow your body to sink as far down between the bars as possible.
- Reverse the motion and return to the starting point, exhaling, as you complete the movement.

The more you bend forward, the more you work the pectorals. Conversely, the more you straighten your arms, the more you involve the triceps.

This exercise is excellent for strengthening the pectorals major and minor and increasing the flexibility of the pectoral girdle. However, it is not recommended for beginners because it requires walls on both sides of the bars, but you can use a mat or mat to support your body and add two or more people to support yourself.

Sets of 10 to 20 reps give the best results. To gain more power and size, experienced athletes can begin with a dumbbell between their legs or place barrel plates around their waist.

Note: Always perform the dips carefully to avoid traumatizing the shoulder joint.
DUMBBELL PRESS

Lie flat on the bench with your feet on the floor for stability, your arms extended forward, and your hands facing in toward each other holding the dumbbells.

- Inhale and lower the dumbbells to chest level, bending your elbows and rotating your forearms to bring your hands in pronation.

- Press the dumbbells back up and do an isometric contraction to engage the stress on the upper pecs while exhaling as you complete the movement.

This exercise is similar to the bench press except that the longer range of motion inherently possible with dumbbells helps to stretch the pectoralis major. The triceps and anterior deltoids are also involved.
DUMBBELL FLYS

Lie flat on a narrow bench to allow free movement of your shoulders. Hold the dumbbells with your arms extended and your elbows slightly bent to lower the stress on the joints.

1. Inhale, then lower the dumbbells until your elbows are at shoulder height.
2. Exhale, raise the dumbbell back up while inhaling.
3. Perform a short isometric contraction at the end of the movement to place more focus on the upper pectoralis major and biceps.

This exercise should never be performed with heavy weight. It isolates the pectoralis major and is an excellent movement for improving flexibility.
INCLINE DUMBBELL PRESS

Lie on an incline bench set at an angle less than 60 degrees to avoid placing too much emphasis on the deltoids with your elbows bent. Hold the dumbbells with an overhand grip:
- Inhale and extend your arms until the weights touch.
- Exhale as you complete the movement.

This exercise—halfway between the incline press and incline dumbbell fly—works the pectorals (particularly the upper part) while stretching them. It also works the anterior deltoids, serratus anterior, and pectoralis minor (both stabilize the scapular, allowing the arm to work with the torso), and the triceps.

Variation: To isolate the effort on the upper pectorals, start the movement with an overhand grip and rotate your wrists so the dumbbells face each other.

PART OF PECTORAL MUSCLES SHOWN HERE
INCLINE DUMBBELL FLIES

**Instructions:**

1. Lie on an incline bench set at an angle between 45 and 60 degrees.
2. Hold the dumbbells with your arms extended or slightly bent to lessen the stress on the elbow joint.
3. While exhaling, lower the dumbbells until your elbows are at shoulder height.
4. Inhale while raising the dumbbells while exhaling.

**Notes:**

- This exercise is best performed with medium or heavy weights.
- Incline bench: 45 degrees.
- The incline helps to isolate the posterior muscles, particularly the upper part. With the incline, it is one of the best exercises to stretch your rib cage.

52
PEC DECK FLYS

Sit on the machine's seat and press your elbows into the pads, lowering your forearms and elbows:
- Breathe in as you begin the movement.
- Breathe out as you complete the movement.

This exercise works and strengthens the pectoral major, and the biceps. It involves the pecs major and the front of the shoulder girdle. It is recommended for beginners because it allows them to gain strength and control before advancing to more difficult movements.
CABLE CROSSOVER FLIES

Stand with your feet slightly spread, your body slightly forward, and your elbows slightly bent. Hold the handles with your arms spread.
- Inhale and pull the cable handle down until your hands touch.
- Exhale as you complete the repetition.

This is an excellent exercise for the pecs. You can vary the tilt of your torso and the angle of your arms to stress the entire pecs or just the major.

**Note:** Cable crossover flies also involve the pecs minor under the pecs major. Besides stimulating the scapula, the pecs minor functions to protect the shoulder.
DUMBBELL PULLOVERS

Lie on the bench, with your feet on the floor. Hold a dumbbell with both hands, palms against the underside of the upper set of plates. thumbs and forefingers encircling the handle.

1. While in the sitting position, exhale.

This exercise develops the entire pectoral muscle and works the lats, long head, triceps, major, latis, serratus anterior, rhomboids, and pectoralis minor. You can do this movement to stretch your ribs, or to do so, use a light dumbbell and make sure you bend your elbows slightly.

If possible, use a corner bench or lie across a flat bench with your pelvis lower than your pectoral girdle. It is best to inhale as much as possible when you start the movement and to exhale only as you near the dumbbell.
BARBELL PULLOVERS

ACTION

Extensor arms, and take an overhand grip on the barbell with your hands shoulder-width apart.

Expiration: Breathe in slowly, as you lower the barbell behind your head, bending your arms slightly.

Expiration: As you return to the starting position.

This exercise develops the broadest, rear deltoid, rear shoulder, latissimus dorsi, trapezius and biceps. It is an excellent movement for stretching the upper back.

Incline your torso, and don’t forget to focus on your breathing.

INSERTIONS OF SERIUS MUSCLES

VERTEBRAE

56
1. Chin-Ups
2. Reverse Chin-Ups
3. Lat Pulldowns
4. Back Lat Pulldowns
5. Close-Grip Lat Pulldowns
6. Straight-Arm Lat Pulldowns
7. Seated Rows
8. One-Arm Dumbbell Rows
9. Bent Rows
10. T-Bar Rows
11. Stiff-Legged Deadlifts
12. Deadlifts
13. Sumo Deadlifts
14. Back Extension
15. Upright Rows
16. Barbell Shrugs
17. Dumbbell Shrugs
18. Machine Shrugs
CHIN-UPS

Grab your arms and take a wide overhand grip on a chin-up bar. Rest your forearms on your chest, as close to the bar as possible. This will help you maintain proper form and control throughout the exercise.

1. Grip: Place your palms facing away from you, with your fingers pointing outward.
2. Start Position: Place your arms shoulder-width apart, with your palms facing away from you. Your body should be straight and your torso should be in line with your legs.
3. Upward Movement: Start by pushing your shoulders back and pull yourself upward, using your arm muscles to lift your body off the ground until your chin reaches the bar. Make sure your shoulders stay pulled back throughout the movement.
4. Downward Movement: Lower yourself back to the starting position, maintaining the same form and tension in your muscles.

Incorporate this exercise into your workout routine, focusing on proper form and gradually increasing the number of repetitions or the difficulty of the movement as you progress.
Variation:
If you stick out your chest, you can pull yourself up so the bar touches your chest. To increase the intensity, you will need added resistance attached to your body. When you pull your elbows to the rear and stick out your chest until your chin reaches the level of the bar, the movement involves the upper and lower latissimus dorsi, as well as the teres major.

This exercise adds thickness to the back. When you stick your scapular together, the rhomboids and the interior part of the trapezius are also worked.

Evolutionary Theory:
Originally, the trees major and latissimus dorsi were involved in making our remote ancestors walk on all fours. They evolved on the limbs as reverse throwers. With the transition to a bipedal life, they became powerful muscles specialized in vertical movement. When our ancestors returned to the ground, they abandoned bipedalism but kept their ability to climb trees. For this reason, we still have powerful back muscles that allow us to pull ourselves up and climb trees, walk, stand, and so forth.

Note: the main difference between our locomotor systems and that of the apes lies in the development of our lower limbs, which are specialized for bipedality. The chest and upper limbs have gibbon-like structure and proportions in those of the apes. Contrary to what you may think, we have long arms; humans have long legs.
Reverse Chin-Ups

Extend your arms and take an underneath grip on the bar with your hands shoulder-width apart. Lift your hips and stick your chest out to pull yourself upward until your chin is at the level of the bar – yippele as you complete the movement.

This movement develops the lats, and terns major. It places intense pulls on the biceps and brachialis, for that reason, it can be integrated into a program focused on improving the arm region. The teres major, middle and lower portions, the biceps, and pectorals are also involved. This exercise requires greater strength. It is easier to perform using a high pulley.
LAT PULLDOWNS

Sit facing the machine and wedge your knees under the restraint pad provided. Take a very wide overhand grip on the bar.

1. Exhale and pull the bar down to your upper chest, arching your back and bringing your elbows back. This is the starting position for the exercise.

2. As you complete the movement, you can feel the tension in your back muscles. This exercise is particularly effective for strengthening the middle and lower traps, as well as the rhomboids and levator scapulae.

3. For an added challenge, try performing the exercise with your feet flat on the floor or with one leg on the raised seat of the machine.

VARIATION
Palms Facing IN WITH WIDE GRIP
BACK LAT PULLDOWNS

Set the machine and secure your thighs under the instant bar. Take a very wide overhand grip on the bar. Inhale and pull the bar down behind your neck, bringing your elbows back to your sides. Exhale as you complete the movement. This is an excellent exercise for enhancing the back's width. It works the lats, particularly the outer part. It also works the forearm flexors, biceps, biceps, and abdominal in conjunction with the thorax and lower trapezius muscles, which work to press the scapula together. Lat pull-downs are good for beginners because they allow you to gain strength before trying the chest.

ACTION OF RESPIRATION AND LUNG MOVEMENTS

62
CLOSE-GRIP LAT PULLDOWNS

Sit facing the machine and place your forearms under the restraint pad. Grip the handles with your palms facing toward each other.

- Inhale and pull the handles to the upper part of your chest, arching your back and slightly tilting your upper body backward.
- Exhale as you complete the movement.

This is an excellent exercise for strengthening the lat and teres major. When you pinch your scapula together, you work the rhomboids, trapzes, and posterior deltoids. Every pulldown exercise works the lats and biceps, and places intense emphasis on the brachialis.
STRAIGHT-ARM LAT PULLDOWNS

Stand facing the machine with your feet slightly apart. Grab a shoulder-width overhand grip on the bar with your arms straight. Keep your back muscles tight and your abdomen contracted, inhaling. Simultaneously pull the bar down until it reaches your upper thigh, keeping your elbows extended or very slightly bent. Exhale as you complete the movement.

This exercise works the lats and strengthens the triceps major and the biceps minor, too. It partly contributes to maintaining a stable arm/hand position.
Seated Rows

Sitting the machine, place your feet against the foot bars and lean toward the pulleys:
- Inhal and pull the handle until it touches your lower oblique, arch your back.
- As you pull, the handle toward your torso, be sure your elbows travel as far backward as possible.
- Exhale as you complete the movement.

This is an excellent exercise for building the back. It exercises the Lat, teres major, posterior deltoid, biceps, brachialis, flexor muscles, and the muscle of the movement when you push your scapula together, the trapezius, and thoracic muscles.

WARNING: To avoid the likelihood of back injury, never round your back as you do low pulley rows with heavy weight.

ACTION

1. *Straight-line variation:* The neutral grip pulley with the forearm in extension, long bar, and fixed hands.
   The neutral grip pulley shifts the emphasis on the biceps and the wide grip shifts the focus on the latissimus dorsi muscles.
ONE-ARM DUMBBELL ROWS

Grasp the dumbbell with your palm facing in. Rest the opposite hand and knee on a bench:
- Stand your upper body in position, inhale, and pull the dumbbell as high as possible, keeping your elbow back.
- Be sure your upper arm travels a little away from your torso.
- Exhale as you complete the movement.

This exercise mainly works the bicep, tricep, and midline core muscles, and the posterior and oblique muscles in the end of the contractile. It places a secondary emphasis on the arm flexors, biceps, brachialis, and brachioradialis.

END OF PULLING ACTION
Stand with your knees slightly flexed. Bend your knees at an angle of about 45 degrees, keeping your back straight. Take an overhand grip on the bar with your hands more than shoulder-width apart and your arms dangling straight down from your shoulders.

- Inhale, contract your abdominals symmetrically, and pull the bar straight up until it reaches your chest.

- Return to the starting position, exhaling.

This exercise works the lats, triceps major, posterior deltoids, biceps, brachialis, brachioradialis, and, when you press your scapulae together at the end of the movement, the rhomboids and trapzius muscles.

Bending press works the spinal erectors symmetrically. You can work the back in 10s at various angles by experimenting with different grip widths and types (pronated or supinated), as well as by varying the loaded weight of your bars.
T-BAR ROWS

Stand on a platform provided on each side of the T-bar. Keep your knees slightly bent and your back straight. Bend over at a 45-degree angle or rest against the exercise bench if one is provided.

- Inhale and pull the T-bar up until the plate contacts your chest
- Exhale as you complete the movement.

This exercise is similar to bent rows, places more emphasis on the back and requires less effort to set your body in the correct movement pattern. It works for lats, lower major posterior delts, arms, rhomboids, and the trapezius and rhomboid muscles.

Note: If you take an underhand grip, you shift some work to the biceps and the upper portion of the trapizius at the end of the pull.

68
STIFF-LEGGED DEADLIFTS

Start with your feet placed fairly close to each other, bringing the bar on the floor. Bend forward at the hips, keeping your back arched and, if possible, your hips straight. Take an overhand grip on the bar, with your arms relaxed.

- Inhale as you complete the movement and return the bar back to the floor, keeping your back straight.

This exercise involves all the spinal erectors. When you lift at the hips, straighten your back. At the end, if you feel the urge to bend, keep your hips down. If you feel your back bend, stop lifting.

Note: If you have back problems, this exercise should be performed with caution because of the high amount of stress on the lumbar spine.
DEADLIFTS

Warm up the bar with your feet slightly spread. Keep your back straight and a little arched. Extend your knees until your thighs are almost parallel to the floor. Depending on your proportion and the flexibility of your ankles, you can try this position like an example if your thigh bones and arms are short, place your thighs in a horizontal position so your back is a little above your knees. Take an overhand grip on the bar, with your hands slightly more than shoulder-width apart. You can also use an overhand grip with your hands forward and the other hand back to prevent the bar from rolling and to work with much heavier weight.

- Initially, contract your abdominal and lower back muscles, and lift the bar by straightening your legs to keep your abdomen and keeping your back straight, raising it in front of your thighs.
- When the bar reaches your knees, extend your knees so you are standing erect with your arms straight down at your sides, exhaling as you complete the movement.
- Hold this straightened position for 2 seconds, then return the weight to the floor, making sure you do not hyperextend or arch your back.

The exercise works virtually every muscle. It builds strong hip, lower back, and lower leg power. It also strengthens the back, hips, and quads. With the proper press and the squat, it is one of the movements programmed in powerlifting events.

70
In the movement, whenever you use heavy weight, you need "blocking."

1. Stick out your chest by taking a deep breath and lifting your lungs with air like a balloon. In this way, you will stiffen your rib cage and prevent your upper torso from bending forward.

2. Contract all the abdominal muscles to increase intra-abdominal pressure so your shoulders are pulled back when you are in the top position of the movement.

3. Finally, contact the lower back muscles to arch your lower back and extend the bottom of the spine. These three simultaneous actions are called "blocking." Their function is to avoid rounding the back by flexing the spine, which may cause a slipped disk if you work with heavy weight.
SUMO DEADLIFTS

Stand facing the bar. Place your feet considerably wider than shoulder-width, apart with your toes pointing outward, keeping them in line with your knees.

- Flex your knees until your thighs are parallel to the floor
- Drive your hips forward while keeping your upper body upright.
- Place your arms straight ahead with your hands spread wide. Do not grip the bar too tightly, as this will only limit your range of motion.
- Breathe in as you lower the bar to your thighs.
- Breathe out as you push the bar back up to your knees.
- Continue this pattern, ensuring you keep your back straight and engage your core.

Unlike normal deadlifts, this exercise places primary emphasis on the quadriceps and adductors, and secondary emphasis on the back, because it is not as much bent at the beginning.

When using heavy weights, be sure to do the movement very slowly, as you should maintain a slight bend in your knees throughout the movement. The avulsion occurs at the beginning of the movement, and the moment of load, as when the bar reaches your thighs, as well as in the eccentric phase, which is already involved in the usage.

The sumo deadlift is one of the three most common movements.

Note: at the beginning of the movement, make sure you engage your buttocks. At the end of the movement, keep your back straight, holding your breath.
Lie face down on the Roman chair with the ankle supports (this pad) properly adjusted and your hips on the support pads.

- Start with your thigh flexed and place your inner body in a position parallel to the floor.
- Be sure to assume the proper seated position to reduce the chance of injury to the lower back.

This exercise places primary emphasis on the buttocks, and thigh hip and secondary emphasis on the spinal rectus and other lower back muscles. In addition, placing the upper body completely in extension or stretching, all the superficial muscles, placing your pelvis on the front pad as surface moves the arm of flexion toward and isolates the work on the superficial, but also in the range of movement and increased leverage.

You can hold the hip extension for a few seconds to help isolate the work.

Beginners can perform this exercise on a specific inclined bench for more comfort.

**Variation:** With a specific machine, you can isolate the stress on the superficials.
Upright Rows

- Stand with your feet slightly spread. Keep your back straight. Take an overhand grip on the bar with your hands palm width apart or a little more.
- Slide your palms in firmly back until they contact your chin.
- Lift your elbows as high as possible at the top point of the movement.
- Exhale and slowly lower the barbell back to the starting point.

This exercise works the upper trapezius and medial-posterior deltoid group most intensely. Secondary emphasis is placed on the anterior delts, biceps, triceps, latissimus dorsi, and rhomboids.

The wider your grip, the more the movement works the shoulder and the less it works the trapezius muscles.
BARBELL SHRUGS

- Stand with your feet slightly apart, facing the bar sitting on the floor or on a weight rack.
- Take an overhand grip on the bar or an under grip if the weight is heavy, with your hands a little more than shoulder-width apart.
- Keeping your arms and back straight, contract your deltoids and shrug your shoulders upward and to the rear as high as possible.

This exercise targets the trapezius muscles. Secondary emphasis placed on the deltoids.
DUMBBELL SHRUGS

Stand with your feet slightly apart. Keep your back straight or slightly bent forward. Hold the dumbbells with your arms extended at your sides.

- Shrug your shoulders as high and as far back as possible.
- Lower the dumbbells back to the starting point.

This exercise isolates the upper and middle part of the trapezius muscles, upper scapular, and the rhomboids when you press your scapulae together to shrug your shoulders to the rear.

BEGINNING OF MOVEMENT

ACTION OF THE TRAPEZIUS

ROTATION AT THE END OF MOVEMENT

76
**MACHINE SHRUGS**

Stand facing the machine. Take an underhand grip on the bar, with your hands slightly more than shoulder-width apart. If the machine allows it, with your palms facing each other:

- Keep your head and back straight and shrug your shoulders.

- Return to the starting position.

This exercise is excellent for developing the upper part of the trapezius and the levator scapulae.
1. Dumbbell Squats
2. Squats
3. Front Squats
4. Power Squats
5. Angled Leg Press
6. Hack Squats
7. Leg Extensions
8. Lying Leg Curls
9. Standing Leg Curls
10. Seated Leg Curls
11. Good Mornings
12. Cable Adductions
13. Machine Adductions
14. Standing Calf Raises
15. One-Leg Toe Raises
16. Donkey Calf Raises
17. Seated Calf Raises
18. Seated Barbell Calf Raises
Stand with your feet slightly apart and grasp a dumbbell in each hand with your arms hanging down at your sides.

- Look straight ahead, inhale, slightly arch your back, and squat down.
- Once your thighs are parallel to the floor, straighten your legs to return to the starting position.
- Exhale as you complete the movement.

This exercise particularly works the quadriceps and glutes.
SQUATS

The squat is the number one bodybuilding movement because it involves a large part of the muscular system. To perform it, place 3 barbells on a squat rack. Back under the bar and position it across your shoulders on the trajectories, slightly above the posterior part of the shoulders. Cross the bar across a strip width appropriate to your body type and pull your elbows to the rear.

- Inhale deeply, then maintain a neutral, straight back, and lift the bar straight up, then extend your knees, and squat down your back slightly bent forward.

HOW TO POSITIO THE BAR

- You should grip the bar with hands width apart, slightly aligned inward.
- Slowly lower your knees, and squat down your back slightly bent forward.

80
To avoid injury, keep your back straight (the area of flexion runs through the high-thigh part).

1. Open your thighs are parallel to the floor, extend your legs and straighten your toes to return to the starting (upright) position.

2. Execute as you complete the movement.

Squats particularly work the quadriceps, gluteus, adductor, spiral erector, dorsum, and hamstrings.

Variations:
1. If you have inflexible ankles or long thigh bones, rest your heels on a block of wood to avoid bending too far forward. This variation shifts part of the stress to the quadriceps. However, this variation can position the knees too far forward for safe lifting as use it with caution.

2. You can position the bar lower, across your upper back, to improve your balance and increase the lifting power of your back, which allows you to use heavier weight. This technique is commonly used by powerlifters.

3. You can do squats on a specific machine to prevent yourself from bending forward and isolate stress on the quadriceps.

In any movement, whenever you are heavy weight, you must “lock.”

1. Stick out your chest by taking a deep breath and lifting your lungs as you breathe. In this way, you will stiffen your rib cage and present your upper torso from bending forward.

2. Contract all the abdominals muscles to increase intra-abdominal pressure on your shoulders. Pull the bottom of the spine.

3. Finally, contact the lower back muscles to arch your lower back and resist the bottom of the spine. These three simultaneous actions are known as “locking.” Their function is to solidify transferring the back (i.e., flexing the spine), which will cause a slipped disk if you work with heavy weight.
3 FRONT SQUATS

Position the kyphosis, press your anterior delts, hold your upper arms parallel to the floor, bend your elbows, cross your arms, grasp the bar, and look straight ahead.

- Inhale and squat down.
- Return to the starting point, extend as you complete the movement.

While doing front squats, you must not bend forward, but keep your back perfectly straight. You can rest your heels on a block of wood to improve your balance, but doing so might move your knees too far forward for schizophrenia.

This type of squat places primary emphasis on the quadriceps.

Always use lighter weights than in the conventional squat. This 90/90/90 front squat also works the gluteals, hamstrings, abs, and the general movement.

Weightlifters often use this movement because it works the thigh muscles exactly the same way as when doing clean or finishing matches.
This movement is the same as conventional squats, but your legs are widely spread with your toes pointed outward, which specifically works the inner thighs.

The muscles involved are:
- the quadriceps,
- all the adductors (adductor longus, adductor magnus, adductor brevis, pectineus, and graciles),
- the gluteals,
- the hamstring group, and
- all the sartorius muscles.
ANGLED LEG PRESS

Warning: using the leg press with heavy weight may cause a displacement in the semilunar joint, which can lead to contraction.

Sit on the machine, lying back against the angled back pad, and place your feet about shoulder-width apart.

- Inhale; rotate the stop bars at the sides of your hips to release the tension on your set.
- Bend your legs as much as possible while making sure your knees are lined up with the sides of your chest.
- Return to the starting position, exhaling as you complete the movement.

If you place your feet lower on the foot plate, you will primarily stress your quadriceps. Conversely, if you place your feet on the top of the foot plate, you will shift more emphasis to the buttocks and hamstrings. If you spread your legs, the adductors will be more involved. If you have back problems, you can do this movement instead of squats. However, always keep your buttocks on the pad.

Feet high on the plate
Principally emphasis on the gluteals and hamstrings

Feet low on the plate
Primary emphasis on the quadriceps

Feet apart
Primary emphasis on the adductors

Feet close together
Primary emphasis on the quadriceps
Hack Squats

Five your knees, place your back against the padded section, wedge your shoulders beneath the yoke, attach to the machine, and place your feet with your toes together. 

- Inhale, rotate the stop bar on the sides of the yokes to relieve the machine, and bend your legs forward to the starting position, exhaling as you complete the movement.

This movement emphasizes the quadriceps. Remember your feet should be together, you will place more emphasis on the quadriceps. If you varied your feet, you will shift the work to the adduction.

To protect your back from injury, be sure to contract your abdominals in order to avoid setting your pelvis and spine.
Set on the machine. Grip either the handles or the edges of the sitting platform so steady your body throughout the movement. Bend your knees and place your ankles under the set of roller pads:
- Align and raise your legs until they are about parallel to the floor.
- Exhale as you complete the movement.

This is the best quadriceps isolation movement. The more you incline the back of the seat, the more your pelvis is tilted backward. The rectus femoris will then be stretched and will be more intensely worked as you raise your legs.

This exercise is recommended for beginners. It allows you to gain enough strength before trying more technical movements.
LYING LEG CURLS

Lie face-down on the padded surface of the machine. Grip the handles, straighten your knees and hook your feet under the set of roller pads.

- Inhal and simultaneously raise your feet upward until your knees are as fully bent as possible try to touch your buttocks with your feet.
- Exhale as you complete the movement.
- Slowly return to the starting position.

This exercise involves the entire hamstring group as well as the gastrocnemius. In theory, as you curl your feet upward you can place more emphasis on either the semitendinosus and semimembranosus (by angling your toes inward) or on the biceps femoris long and short heads (by angling your toes outward). However, in practice it turns out to be difficult, and only the placing of primary emphasis on the biceps femoris or gastrocnemius is easy.

- Feet extended puts more stress on the hamstrings.
- Feet flexed/abducted puts more stress on the gastrocnemius.

Variation: you can perform this exercise with one leg at a time or by holding a barbell with both legs.

ACTION

E. Beginning

VARIATION

Hold a dumbbell with both feet.
STANDING LEG CURLS

Stand in the machine so your knee is pressed against the movable pad. Flex your ankle under the roller pad, straighten your leg, and grasp the machine to maintain your upper body as you do the movement:
- Inhale and bend your knee
- Exhale as you complete the movement

This exercise works all the muscles of the hamstring group (gastrocnemius, semimembranosus, biceps femoris, short and long head) and, to a lesser extent, the gastrocnemius. Simply extend your ankle while cutting the roller pad. To decrease the work on the gastrocnemius, which is the intent in most cases, simply extend your foot.
SEATED LEG Curls

In the hamstring group, only the biceps femoris short head is involved. It exclusively flexes the leg.

Sit on the machine with your legs straight, ankles resting on the rollers and lower the leg restraint over your thighs to secure them. Grasp the handles provided on each side:

- Inhale and bend your knees to move the roller pad downward
- Exhale as you complete the movement

This exercise works the hamstring group and, to a lesser extent, the gastrocnemius.
STRENGTH TRAINING ANATOMY

G O O D  M O R N I N G S

Standing with your feet slightly apart. Place a ball across your lower back or a little lower across your posterior deltoids.

- While and bend forward at the waist until your arm is roughly parallel to the floor, being sure to keep your back straight.

- Refrain to the starting position, inhaling.

To make the movement easier, you can slightly bend your knees. This exercise involves the gluteus and spinal erectors, and particularly the hamstrings through the biceps femoris short head, which only shoots the leg. Besides the leg, the main function of the hamstrings (pulling the pelvis backward, straightening the upper body of the future arm to contract the bicipital muscles and posteriorly symmetrically).

To get better construction in the hamstrings, must do this movement with heavy weight. In this exercise, the negative phase is excellent for stretching the back of your thighs. If you do it regularly, it will enhance the flexibility of muscles when doing heavy squats

This exercise does pose a high risk to the lumbar spine, so perform it with caution.

ACTION OF GLUTEUS MUSCLES AND THE HAMSTRINGS DURING PULLS STRAIGHTENING

- Action of gluteus maximus
  - hip extension
  - knee flexion

- Action of biceps femoris
  - knee flexion
  - ankle plantarflexion

- Action of semitendinosus
  - knee flexion
  - ankle plantarflexion

- Action of semimembranosus
  - knee flexion
  - ankle plantarflexion

- Action of gastrocnemius
  - knee flexion
  - ankle plantarflexion

- Action of soleus
  - knee flexion
  - ankle plantarflexion
Largely, we call to your ankle and grasp a fixed part of the machine with your opposite hand for support.

... Aiding your leg attached to the cable toward and then across the other leg.

Return to the starting position.

This move involves all the adductors (pectineus, adductor longus, adductor magnus, and gracilis). It is an excellent movement for building the inner thighs.
Sit on the machine with your legs spread.
- Force your thighs together.
- Slightly return to the starting position.

This exercise works the adductors (groin muscles), adductor longus, adductor magnus, and gracilis. You can use heavier weight than with the cable adductions, but the range of movement will be more limited.
Stand with your back straight. Place your shoulders under the pads of the machine. Place your toes and the balls of your feet on the toe block and lower your heels (kneepads) in.

- Flex as high as you can on your toes (plantarflexion) while keeping your knees extended.
- Return to the starting position.

This exercise works the tibialis anterior, flexor hallucis longus, and the gastrocnemius lateral head. To stretch your muscles correctly, be sure to raise up as high as possible on your toes as you perform every repetition. In theory, it is possible to isolate the stress on the gastrocnemius lateral head from the soleus, but in practice, this is difficult to achieve. However, you can easily shift the emphasis from the gastrocnemius to the soleus by flexing your knees to relax the gastrocnemius.

Variation: You may also do the exercise at the Smith machine, using a block or plates under your toes for greater range of motion. You may also place a bar on your shoulders, without the block, but this, with a lower range of motion.
ONE-LEG TOE RAISES

Start on one foot, placing the toes and ball of your foot on the toe block. Hold a dumbbell in your hand on the same side as the foot you are standing on and grasp the edge of machine with your other hand to steady your body in position throughout the movement.

- Rise up as high as you can on your toes (plantarflexion), keeping your knee extended or very slightly bent.
- Return to the starting position.

This exercise works the triceps surae, composed of the soleus and gastrocnemius, lateral and medial heads. Make sure you flex your foot completely as you perform every repetition in order to stretch the triceps surae correctly. For the best results, do only long sets until you feel the burning sensation.
Place your toes and the balls of your feet on the footplate, straighten your legs, and lean over so your torso is parallel to the floor. Rest your forearms on the bench support and press your palms against the padded surface of the machine:

- Drop your heels as far below your toes as possible (plantarflexion)

- Rise up as high as you can on your toes until your calves are fully flexed (plantarflexion)

This exercise works the triceps surae. With the knee fixed, it emphasizes the soleus.

Variation: you can also arrange a bar block close enough to a flat exercise bench so you can place your toes on the block, lean over having your knees parallel to the floor, and rest your forearms on the bench. For resistance, have a training partner climb up inside your legs as it riding a bike.
SEATED CALF RAISES

Sit on the machine's seat and place the resistive pads tightly across your thighs. Place your toes and the balls of your feet on the foot bar. Match your knees as to the level of your toes in possible parallelism.

- Rise up as high as you can under resistance on your toes (plantarflexion).

This exercise primarily emphasizes the soleus muscle lying immediately below the gastrocnemius, attached under the knee joint and connected with the calcaneus via the Achilles tendon. The function of the soleus and gastrocnemius is to extend the ankles, thereby increasing leg extension. Therefore, the gastrocnemius holds only slightly stronger when you extend your feet.

Variation: Sit on a bench with your toes and the balls of your feet on a toe-block. Pull the middle of a elastic band by the pulling a towel around it and rest the right end across your knees to simulate the movement.
1. Lunges
2. Cable Kick Backs
3. Machine Hip Extensions (Kick Backs)
4. Floor Hip Extensions (Kick Backs)
5. Bridging
6. Cable Hip Abductions
7. Standing Machine Hip Abductions
8. Floor Hip Abductions
9. Seated Machine Hip Abductions
LUNGE

Stand with your feet hip-width apart. Lift a slight barbell up to a position across your shoulders behind your neck:
- Inhale and take a comfortable step forward, keeping your torso as upright as possible.
- In the bottom position, the top of your forward thigh is slightly below parallel.
- Return to the starting position, exhaling.

This exercise places primary emphasis on the quadriceps. You can vary the stride length by taking (i) a simple step forward to specifically involve the quadriceps, or (ii) a large step forward to place more stress on the hamstrings and glutes while stretching the upper quadriceps and hip flexors of the back leg.

Note: As you lunge forward, you put all of your body weight on your leading leg. It is a relatively difficult exercise to perform because of the balance required. Beginners should start with very light weight.
CABLE BACK KICKS

Attach a cable to the end of the cable running through the low pulleys. Tie the other end around your ankle. Stand in front of the weight stack and grasp the edge of the machine for support.

- Tilt your pelvis forward
- Bring your leg back

The maximum of the leg is limited by the stress placed on the iliotibial band. This exercise involves the glutes maximus and, to a lesser extent, the hamstrings except the biceps femoris, short head. This exercise allows you to develop strong legs while improving muscle tone in your glutes.
To perform the exercise, place your feet on the footplate and bring your opposite leg slightly forward, with the pads of yours between your joint and ankle. Bend forward slightly.

- Slide and move your thigh to the rear until your hip is fully extended backward (hyperextension).
- Hold this position contracted for 2 seconds, and return to the starting position.
- Execute as you complete the extension.

This exercise works the glutals, and, to a lesser extent, the semitendinosus, semimembranosus, and biceps femoris long head.
If your leg is in a straightened position, the exercise will work the hamstrings and the gluteus. If you keep your knee bent, it will only work the gluteus, but less intensely. You can increase the range of motion or limit it at the end of the extension. You can hold a peak contracted position for a couple of seconds at the end of the movement. For more intensity, stop a soft weight around your ankle. This exercise is very easy to perform and gives good results. It has become very popular and is often used in athletics classes.
LIE ON THE FLOOR WITH YOUR ENTIRE SPINE IN CONTACT WITH THE FLOOR. PLACE YOUR HANDS ON THE FLOOR NEXT TO YOUR HIPS. FLEX YOUR KNEES TO 90 DEGREES.

- If your buttocks fall off the floor, pushing your head as high as you can
- Hold the position for 2 seconds and lower your pelvis without letting your buttocks fall back on the floor.
- Immediately repeat.

This exercise works the hamstring and gluteals. Make sure you correctly feel the muscle contraction at the end of every repetition.

Note: This exercise has proved beneficial. It is performed in most92 analyses classes.

VARIATION ON THE BENCH

BEGINNING OF MOVEMENT

103
Attach a low pulley to your ankle.

- Grasp the edge of the machine with your opposite hand to stabilize your body.
- Raise slowly your leg, as far as you can.

This exercise touches the gluteus maximus, the upper gluteus minimus, and tensor fasciae latae.
STANDING MACHINE HIP ABduCTIONS

Place one foot on the foot plate and place the outer side of your other leg against the pad below your knee. Slowly lower your body to your ankle.

Move this leg as high to the side as possible.

Note: the abduction is limited because the neck of the femur (thigh bone) is gently stopped on the rim of the cup into which the femur fits at the pelvis.

This exercise is excellent for developing the gluteus medius and the gluteus minimus, which have the same function as the anterior fibers of the gluteus maximus. It also works tensor fascia latae.
FLOOR HIP ABDUCTIONS

Lie on your side with your head and shoulders in line.
- Lift your leg to an angle of 70 degrees, at the most, off the floor, always keeping your knee extended.
- Return to the starting position and repeat.

This exercise involves the gluteus medius and gluteus maximus. You can increase or decrease the range of motion. Hold a peak contracted position for a couple seconds at the end of the abduction. You can raise your leg either slightly forward, slightly backward, or vertically. For more resistance, strap a small weight around your ankle or use a low pulley.

Although the gluteus medius is deeply situated, most of the muscles also help give more size to the upper buttocks.
SEATED MACHINE HIP ABDUCTIONS

Sit at an abductor machine — slowly bring your legs apart as far as comfortably possible — return to the starting position and repeat.

If the machine’s seat is inclined, you will work the gluteus medius. If the machine’s seat is upright, you will work the gluteus maximus. Ideally, you should vary the inclination of your throne in every set. Simple bend at the waist. For example: 10 reps with upper body against the back of the seat followed by 10 reps with upper body bent forward at the waist.

This exercise is an excellent way to increase muscle tone to the upper part of the hip. It gives the buttocks a rounded appearance, making your waist look slimmer.
1. Crunches
2. Sit-Ups
3. Gym Ladder Sit-Ups
4. Calves Over Bench Sit-Ups
5. Incline Bench Sit-Ups
6. Specific Bench Sit-Ups
7. High Pulley Crunches
8. Machine Crunches
9. Incline Leg Raises
10. Leg Raises
11. Hanging Leg Raises
12. Broomstick Twists
13. Dumbbell Side Bends
14. Roman Chair Side Bends
15. Machine Trunk Rotations
Although this is a much debated topic, if you have lower back problems, you should keep your hip motions less in order to neutralize the action of the psoas and prevent abnormal forward curvature of the spine (lordosis) or other spinal pathologies. Therefore, it is better to stress the rectus abdominis without stretching them, by moving the sternum (breastbone) closer to the pubis with short contractions.
1 CRUNCHES

Lie on your back. Place your hands behind your head. Flex your hips and knees to a 90-degree angle.

- Inhale and lift your shoulders off the floor, moving your knees closer to your head by contracting your torso.
- Exhale as you complete the movement.

The movement particularly works the rectus abdominis. To place more emphasis on the obliques, slowly twist alternately from side to side (move your right elbow to your left knee, then move your left elbow to your right knee, and so on).

The object of the crunch is to shorten your torso, moving your palms closer to your throat, but by deliberately contracting your abdominals.
**SIT-UPS**

**Rectus abdominis**

- Lie on your back with your legs bent and your feet on the floor. Place your hands behind your head.
- Inhale and curl your torso off the floor.
- Exhale as you complete the movement.
- Return to the starting position without resting your torso on the floor.
- Repeat until you feel the burning sensation coming from your abdomen.

*Note:* This exercise works the hip flexors, obliques, and focuses on the rectus abdominis.

**Variations:**

1. For more balance, ask someone to hold your feet.
2. To make it easier, extend your arms forward. This variation is recommended for beginners.

---

**INCLUDED ROUND VARIATION**

- Lie on your back with your legs bent, your torso and feet off the floor.
3 GYM LADDER SIT-UPS

Place your feet in the gym ladder with your hips and knees flexed to 90 degrees. Place your hands behind your head:
- Sit up and try to raise your torso as high as possible off the floor
- Exhale as you complete the movement

This exercise focuses on the rectus abdominis and places secondary emphasis on the internal and external obliques.

Place your arms lower to increase spinal mobility, allowing a greater range of motion and more involvement of the hip flexors.

112
Lie on your back with your calves laying over a flat exercise bench. Place your hands behind your head.

- While and lift your shoulders off the floor.
- Try to touch your knees with your head.
- Exhale as you complete the movement.

This exercise focuses on the rectus abdominis, particularly above the navel. By placing your hands (or feet) down on the bench, you increase pelvic mobility which allows your torso upward by contracting the iliopsoas, tensor fascia latae, and rectus femoris in order to flex the hips.
Sit on the bench and hook your feet under the roller pads. Place your hands behind your neck:

- Inhale and incline your torso from 20 degrees.
- Move your torso back up, slightly arching your torso to place more stress on the rectus abdominis.
- Exhale as you complete the movement.

This exercise works the entire rectus abdominis muscle wall, as well as the oblique, transverse, internal, and external obliques in the quadriceps group. The functional three-ball-three muscles is to lift the pelvis forward.

Variation: If you move back up, you can twist alternately to each side on successive repetitions to shift part of the stress to the obliques.

Example: twisting your torso to the left will more intensely involve the right external oblique, left internal oblique, and the right rectus abdominis.

This movement can be done twisting alternately or simultaneously for the required number of repetitions. In either case, you should concentrate on the movement as you do it and feel the tension in your muscles. There is no advantage to excessively increasing the bench's incline.
**SPECIFIC BENCH SIT-UPS**

Hook your feet under the roller pads with your torso hanging parallel to the floor. Place your hands behind your head.

- Breathe in and retract your torso forward
- Try to touch your knees with your head, being sure to straighten your torso
- Exhale as you complete the contraction

This is an excellent exercise for building up the rectus abdominis. It places secondary emphasis on the obliques. The pelvic tilt normally weakens the rectus femoris, hip flexors, and tensor fascia latae later.

**Note:** Beginners should start with easier exercises to gain the strength level required.

---

1. **Set-up:**
2. **Execution:**
HIGH PULLEY CRUNCHES

Kneel down with the bar behind your neck:
- Inhale and shorten your torso to move your chest toward your thighs
- Exhale during the performance

Never use heavy weight with this movement. It is important to focus on the tension in your abdominals, particularly the rectus abdominis.
MACHINE CRUNCHES

Sit on the seat belt, grasp the handles, and hook your feet under the saddle part.

1. Inhale and shorten your torso, trying to move your chest toward your thighs.
2. Exhale at the end of the movement.

This equipment exercise allows you to select the weight. Beginners should start with light weight. Experienced athletes can safely work with heavy weight.
INCLINE LEG RAISES

Lie on your back on an inclined abdominal bench and grasp the rings.

1. Move your feet until they are directly above your hips.
2. Raise your hips by shortening your toes, trying to touch your head with your knees.

As you raise your legs, the iliotibial bands, tensor fasciae latae, and rectus femoris in the quadriceps group are worked. Then, as you raise your hips and shorten your toes, the abdominals, particularly the rectus abdominis, are involved.

Note: This is an excellent exercise if you find it difficult to feel the work on your lower abdominals. Because this exercise is difficult, beginners should adjust the bench to a lower angle.
REST YOUR ELBOWS ON THE ELBOW SUPPORT PADS AND POSITION THE LUMBAR SUPPORT PAD IN THE SMALL OF YOUR BACK.

- INHALE AND PUSH YOUR KNEES UP TO YOUR CHEST, ROUNDING YOUR BACK TO CONTRACT YOUR ABDOMINALS CORRECTLY.

- EXHALE AS YOU COMPLETE THE MOVEMENT.

This exercise works the hip flexors, particularly the iliopsoas, obliques, and rectus abdominis.

**Variations:**

1. To isolate the abdominals, limit the range of motion by never lower your knees to a position below the horizontal plane, and always keep a slight curve in your spine.

2. To increase the difficulty of this movement, you can perform it with your legs straight. However, doing so requires flexible hamstring.

3. You can hold the peak contracted position for two to three seconds.

**ACTION OF ABDOMENS MUSCLE:**

- **Rectus abdominis:**
  - **Quadiceps femoris:**
  - **Sartorius:**
  - **Pectineus:**
  - **Gastrocnemius, Soleus:**
  - **Gastrocnemius, Medialis:**
  - **Patella:**
  - **Tibialis anterior:**
  - **Exterior oblique muscle:**

**Leg Raises**

- **Pectoralis major:**
- **Serratus anterior:**
- **Obliquus externus abdominis:**
- **Quadriceps, rectus femoris:**
- **Gluteus medius:**
- **Tensor fasciae latae:**
- **Gemellus superior:**
- **Gemellus inferior:**
- **Biceps femoris, short head:**
- **Biceps femoris, long head:**
- **Semimembranosus:**
- **Piriformis:**
- **Soleus:**
Take an overhand grip on a chinning bar. Hang straight.

1. While and raise your knees as high as possible, being sure to move your knees to your chest by shortening your hips.
2. Exhale as you complete the movement.

This exercise works the following muscles:
- Rectus abdominis
- Obliques externus abdominis
- Quadriceps, rectus femoris
- Gluteus maximus
- Tensor fasciae latae
- Gastrocnemius
- Rectus femoris, long head
- Sartorius
- Semitendinosus
- Semimembranosus
- Gastrocnemius, lateral head

To isolate the abdominals, limit the range of motion, without lowering your knees to a position below the horizontal plane.
Stand with your feet spread. Hold a broomstick across your traniers, above the pubic symphysis. Make sure you don’t pull too hard or hang too much on the broomstick.

- Keep your upper body more side to side.
- Keep your pelvic hips neutral by contracting the gluteals isometrically throughout the movement.

As you rotate your right shoulder forward, this movement works the right external oblique, left internal oblique, and, to a lesser extent, the rectus abdominis and the left spinal erectors. In addition, you may slightly extend your back. This exercise can also be done while sitting on a bench with your legs bridging the bench to keep your hips stationary and isolate the abdominals.
DUMBBELL SIDE BENDS

- Stand with your feet slightly apart. Place your left hand behind your neck, holding a dumbbell in your right hand.
- Bend your torso to the left side.
- Return to the starting position, or move slightly further to the other side by bending at the waist gently.

At 90° to the floor, perform each exercise for sets and reps with the dumbbell held in each hand. Do not rest between the sets.

The exercise focuses on the obliques on the side you bend with and places secondary emphasis on the rectus abdominis and quadratus lumborum muscles of the back, attached to the 12th rib, transverse aponeurosis of the lumbar region, and crest of the ilium.
Using a Roman chair position your feet on the support pad. Hook your feet under the roller pads. Place your hands behind your head or across your chest, your upper body slightly above horizontal.

- Lift and twist your upper body back and forth.
- Continue on the same side for one set, then alternate sides.

This movement focuses on the obliques and rectus abdominis of the side you bend, but the opposite obliques and rectus abdominis are also worked by compensating isometrically to prevent your torso from going below the horizontal plane.

Note: this movement continuously works the quadratus lumborum.
MACHINE TRUNK ROTATIONS

Stand on the raised plate and hold the handles.
- Lift your hips first and roll to the other being sure to keep your shoulders stationary throughout the movement.
- Bend your knees slightly, making sure you perform the movement under control.

This exercise works the external and internal obliques with secondary emphasis on the rectus abdominis. To feel the effort more strongly, you can slightly round your back.
3. For every action there is an equal and opposite reaction.

spina—The back part of the hoof or skull.

pastoral grade—The heavy or cartilaginous awl that supports the forepaw.

prostration from Latin prorsus—To bend forward.

1. Rotation of the arm and forearm so that the palmar face is downward.
2. Prominent grasp gathering the bar so the palms face downward and the thumbs face each other. Also called hand grasp.

protraction of the forelimbs of an organ.

pассивный—Passive, and extends the thigh to valgus and twists the ankle. originated as the lowest self-antagonist with movement at the femur small trochanter via a motion in common with the Merchant.

public supply—A nervous articulation (assemble) of the superficial layer (tendons) of the humerus muscle (see image). Also called a biceps.

radius from Latin radius—"Ray."—The bone on the thumb side of the forearm (see image).

retronversion—The bending backward of a body part.

racetum from Latin raetum—"Racer bone."—The part of the yolk column that is closely connected without a form, a portion of the rib and consists of the united vertebrae.

sequestrum—A piece of bone in a piece of bone. (seen here in the middle of the bone, being the principal bone of the corresponding half of the sectional guide and superimposed with the surrounding clavicle as connective. Also called a hock or bladed bone.

quadruped—Or relating to the shoulder or the quadruped mammal.

sulcal from Greek sulcus, "Sly."—A sulcus or depression of the palm of large bones in the body that arise one on each side from the same plane superimposing the palm, toe and pectoral regions and that

pass out of the pelvis and does the back of the thigh.

2. Scapula—Along the course of the scapula nervus especially in the back of the thigh; finally, pain in the lower back, buttocks, hips, or adjacent parts.

shoulder—The latissimus dorsi or the humerus bone forming the junctions and joints by which the arm is connected with the trunk and the muscles connected with them.

slipped disk—A protrusion of part of the cartilage disk between vertebrae with pressure on an arterial nerves causing low back pain or sciatic pain.

snatch—A lift in weight lifting, in which the weight is raised from the floor directly to an overhead position in a single motion (see image).

spinal from Latin spine, "spine."—
1. Off, relating to, or situated near the backbone.
2. Of, relating to, or affecting the spinal cord.

spatula—Spatulas used to hold a handful of shoulder height, typically used in placing the bar on the back for the squat exercise.

sternum—A compound vertical bone that connects the ribs or the shoulder blade or both and consists of the manubrium, gladiola, and xiphoid process. Also termed breastbone.

supina tion—Rotation of the forearm and hand so that the palm faces forward or upward and the radius lies parallel to the ulna.

supinator (from Latin supinare, "to lay back")—A muscle that produces the rotation of supination.

synthesis—An interference or more or less nervous articulation of various bones in the middle plane of the body (see image).

curvilinear membrane—Membrane covering the inner side of movable articulations or diarthromes, it contains a fluid called synovia.

torso—A tough cord or bundle of dense white fibrous connective tissue that unites a muscle with some other part and transmits the force which the muscle exerts.

trauma—An injury to living tissue caused by an external agent.

trochlea from Greek trochleus, "axle."—A slight prominence at the upper part of the femur.

ulna—The bone on the little-finger side of the forearm.

vertebrae—the 34 or 36 bones or cartilaginous segments composing the spinal column (C cervical vertebrae, 7 thoracic vertebrae, 5 lumbar vertebrae, 5 sacral vertebrae forming the sacrum, and 3 or 4 or 5 coccygeal vertebrae forming the coccyx).

vital capacity—The breathing capacity of the lungs expressed as the volume of air that can be forcibly expired after a full inspiration (in average, 1.1 liters in persons over 43 years of age).