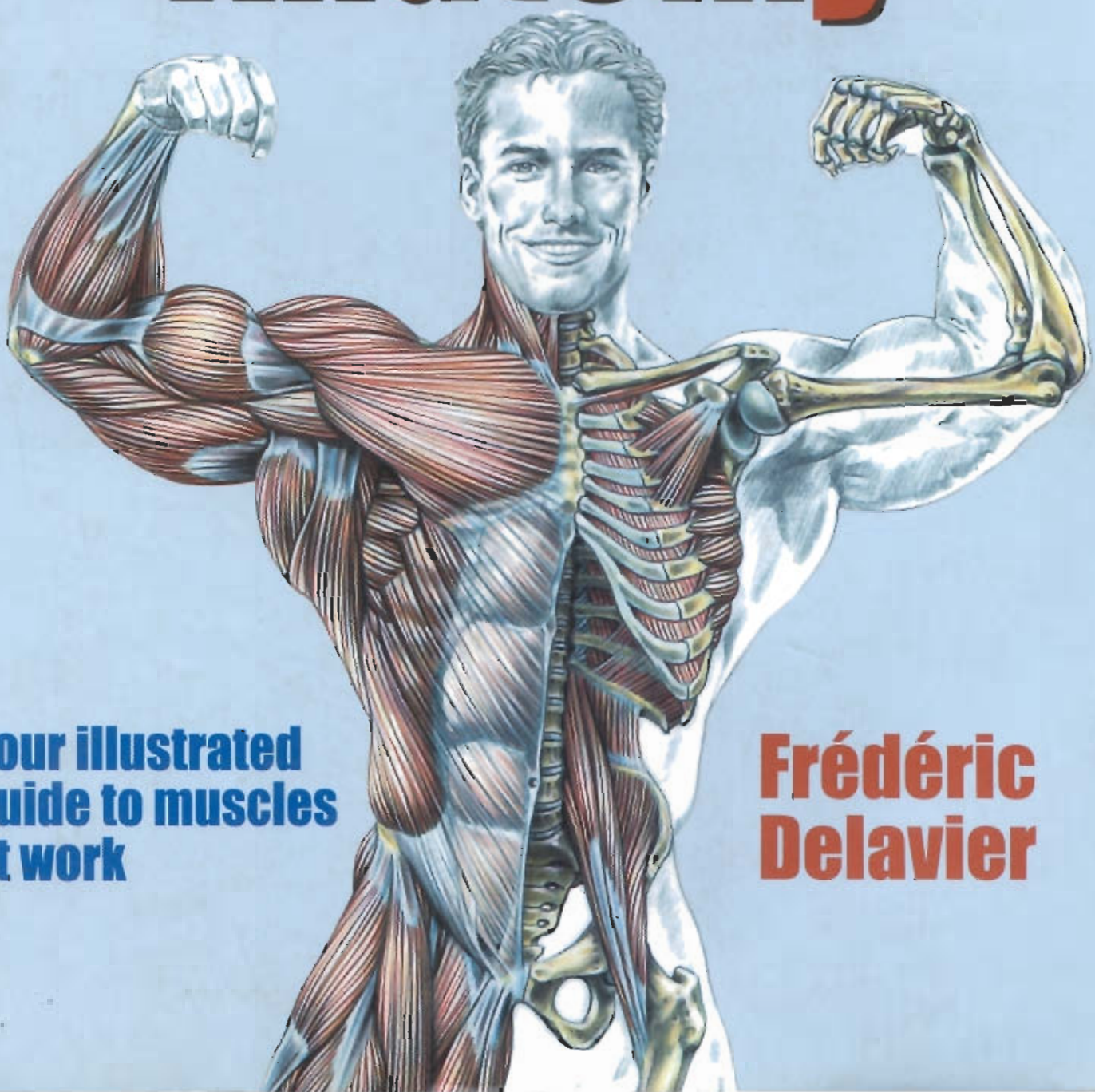
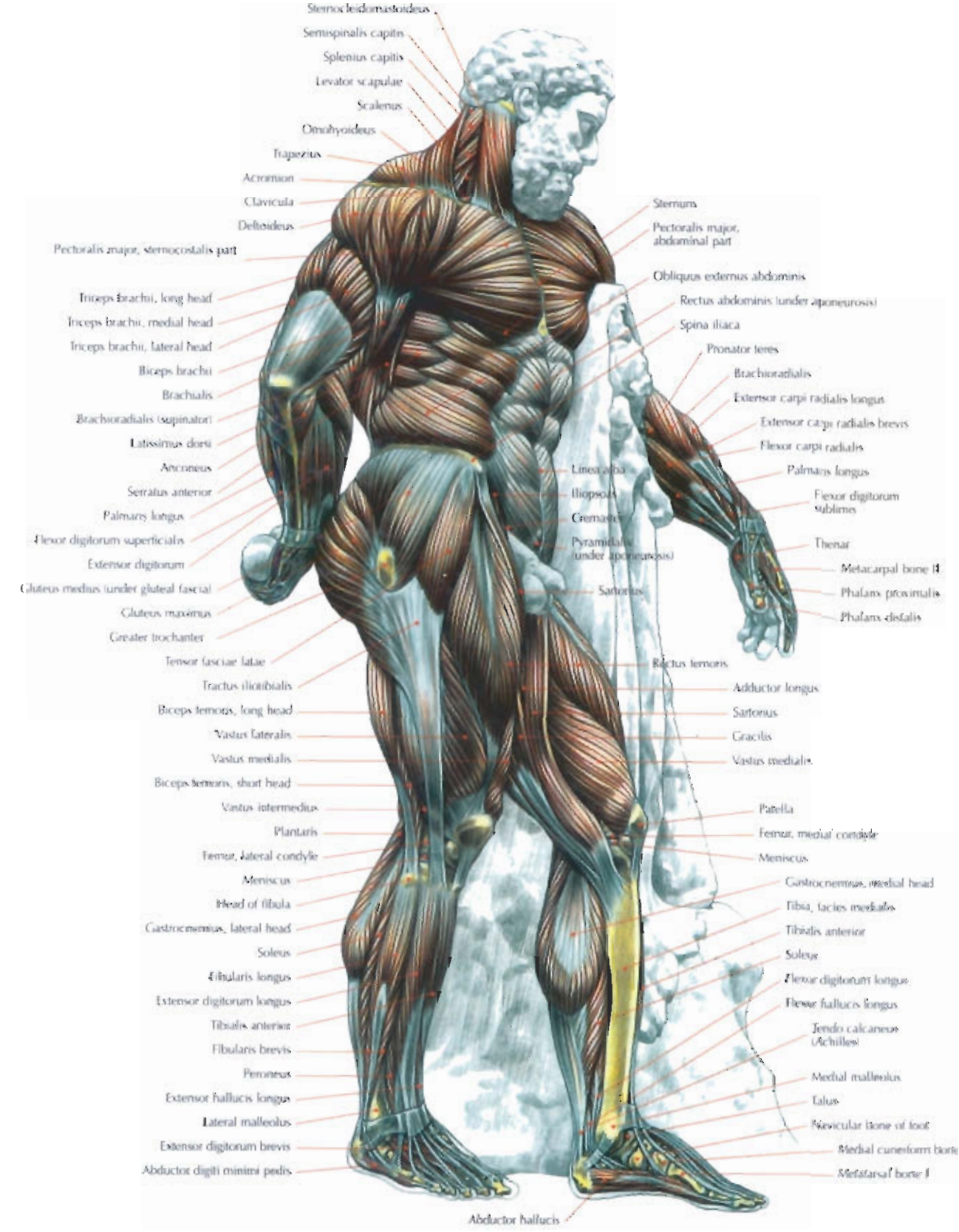
Strength Training Anatomy



Your illustrated guide to muscles at work

Frédéric Delavier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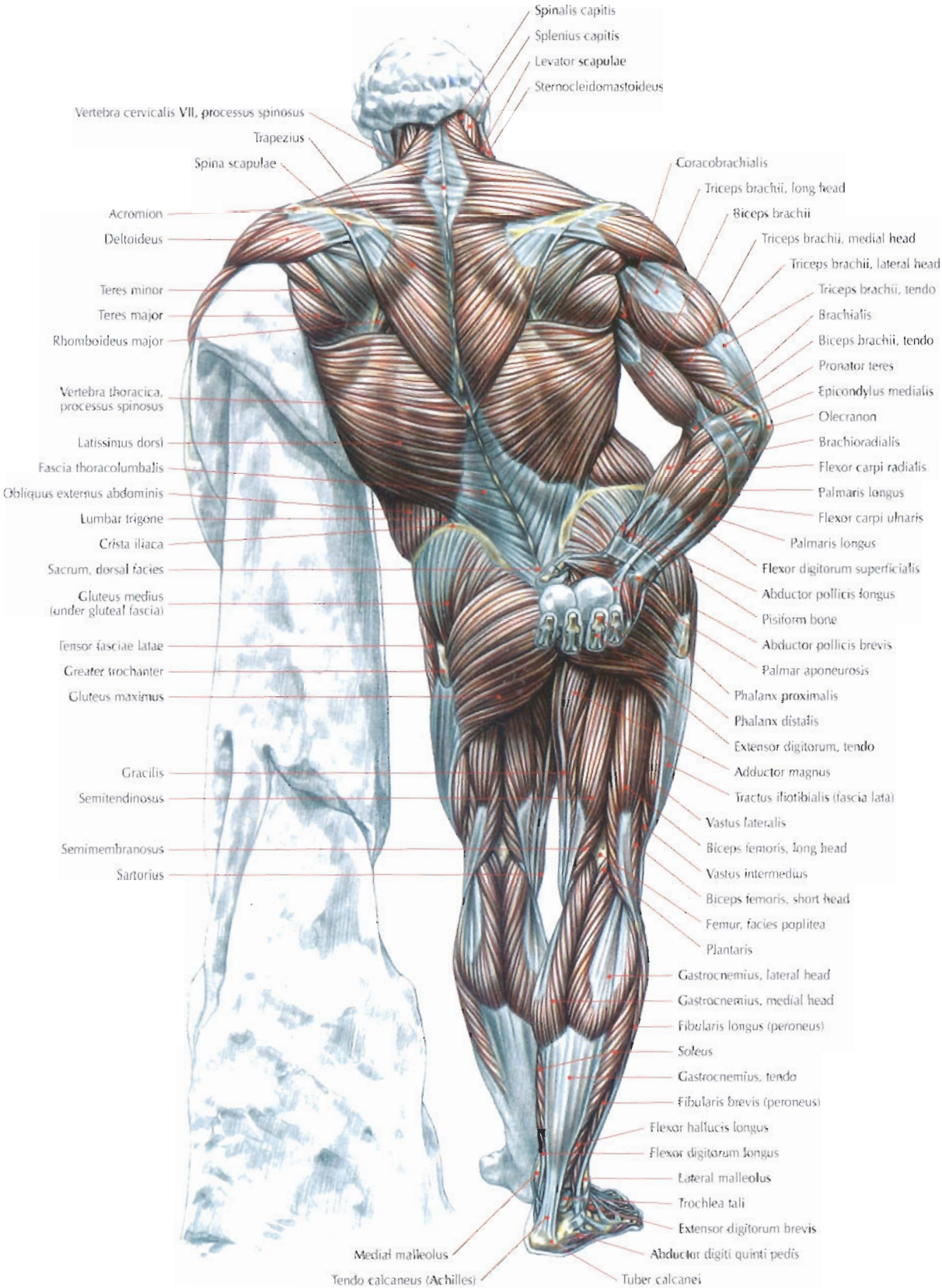
Semispinalis capitis
Splenius capitis
Levator scapulae
Scalenus
Omohyoideus
Trapezius
Acromion
Clavicula
Deltoideus
Pectoralis major, sternocostalis part
Triceps brachii, long head
Triceps brachii, medial head
Triceps brachii, lateral head
Biceps brachii
Brachialis
Brachioradialis (supinator)
Latissimus dorsi
Anconeus
Serratus anterior
Palmaris longus
Flexor digitorum superficialis
Extensor digitorum
Gluteus medius (under gluteal fascia)
Gluteus maximus
Greater trochanter
Tensor fasciae latae
Tractus iliotibialis
Biceps femoris, long head
Vastus lateralis
Vastus medialis
Biceps femoris, short head
Vastus intermedius
Plantaris
Femur, lateral condyle
Meniscus
Head of fibula
Gastrocnemius, lateral head
Soleus
Fibularis longus
Extensor digitorum longus
Tibialis anterior
Fibularis brevis
Peroneus
Extensor hallucis longus
Lateral malleolus
Extensor digitorum brevis
Abductor digiti minimi pedis
Abductor hallucis
Sternum
Pectoralis major, abdominal part
Obliquus externus abdominis
Rectus abdominis (under aponeurosis)
Spina iliaca
Pronator teres
Brachioradialis
Extensor carpi radialis longus
Extensor carpi radialis brevis
Flexor carpi radialis
Palmaris longus
Flexor digitorum sublimis
Thenar
Metacarpal bone II
Phalanx proximalis
Phalanx distalis
Linea alba
Iliopsoas
Cremaster
Pyramidalis (under aponeurosis)
Sartorius
Rectus femoris
Adductor longus
Sartorius
Gracilis
Vastus medialis
Patella
Femur, medial condyle
Meniscus
Gastrocnemius, medial head
Tibia, facies medialis
Tibialis anterior
Soleus
Flexor digitorum longus
Flexor hallucis longus
Tendo calcaneus (Achilles)
Medial malleolus
Talus
Navicular bone of foot
Medial cuneiform bone
Metatarsal bone I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Trapezius
Spina scapulae
Acromion
Deltoideus
Teres minor
Teres major
Rhomboideus major
Vertebra thoracica, processus spinosus
Latissimus dorsi
Fascia thoracolumbalis
Obliquus externus abdominis
Lumbar trigone
Crista iliaca
Sacrum, dorsal facies
Gluteus medius (under gluteal fascia)
Tensor fasciae latae
Greater trochanter
Gluteus maximus
Gracilis
Semitendinosus
Semimembranosus
Sartorius
Coracobrachialis
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Biceps brachii
Triceps brachii, medial head
Triceps brachii, lateral head
Triceps brachii, tendo
Brachialis
Biceps brachii, tendo
Pronator teres
Epicondylus medialis
Olecranon
Brachioradialis
Flexor carpi radialis
Palmaris longus
Flexor carpi ulnaris
Palmaris longus
Flexor digitorum superficialis
Abductor pollicis longus
Pisiform bone
Abductor pollicis brevis
Palmar aponeurosis
Phalanx proximalis
Phalanx distalis
Extensor digitorum, tendo
Adductor magnus
Tractus iliotibialis (fascia lata)
Vastus lateralis
Biceps femoris, long head
Vastus intermedius
Biceps femoris, short head
Femur, facies poplitea
Plantaris
Gastrocnemius, lateral head
Gastrocnemius, medial head
Fibularis longus (peroneus)
Soleus
Gastrocnemius, tendo
Fibularis brevis (peroneus)
Flexor hallucis longus
Flexor digitorum longus
Lateral malleolus
Trochlea tali
Extensor digitorum brevis
Abductor digiti quinti pedis
Medial malleolus
Tendo calcaneus (Achilles)
Tuber calcanei


Omohyoideus
Clavicula
Acromion
Pectoralis major
Deltoideus
Pectoralis major, abdominal part
Biceps brachii
Brachialis
Triceps brachii, lateral head
Pronator teres
Brachioradialis
Extensor carpi radialis longus
Flexor carpi radialis
Extensor carpi radialis brevis
Extensor digitorum communis
Abductor pollicis brevis
Radius
Gluteus medius, fascia
Tensor fasciae latae
Fascia lata, iliotibial tract
Fascia lata, tractus ilio-tibial
Tractus iliotibialis
Head of fibula
Gastrocnemius
Fibularis longus
Extensor digitorum longus
Fibularis brevis
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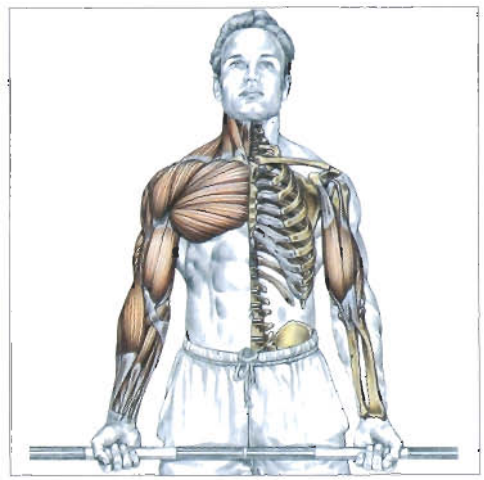
Serratus anterior
Latissimus dorsi
Rectus abdominis (under aponeurosis)
Epicondylus lateralis
Olecranon
Anconeus
Anulus umbilicus
Obliquus internus abdominis (under aponeurosis)
Obliquus externus abdominis
Pyramidalis (under aponeurosis)
Spina iliaca
Iliopsoas
Pectineus
Sartorius
Adductor longus
Gracilis
Rectus femoris
Vastus lateralis
Vastus medialis
Patella
Lateral condyle
Meniscus
Patellar ligament
Tuberositas tibiae
Gastrocnemius
Tibialis anterior
Soleus
Tibia, facies medialis
Flexor digitorum longus
Extensor hallucis longus
Peroneus tertius
Medial malleolus
Extensor hallucis brevis
Extensor digitorum brevis
Abductor hallucis

STRENGTH TRAINING ANATOMY

FRÉDÉRIC DELAVIER



HUMAN KINETICS

CONTENTS

1 ARMS

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19. Seated EZ-Bar Triceps Extensions
20. Triceps Kickbacks
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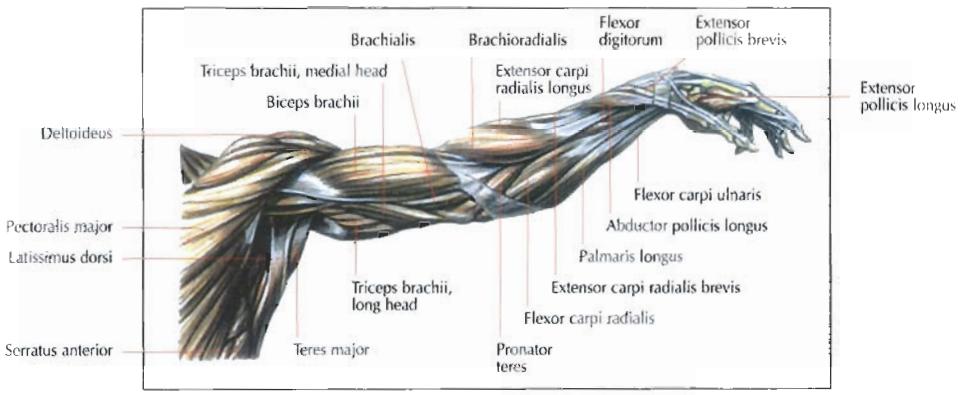
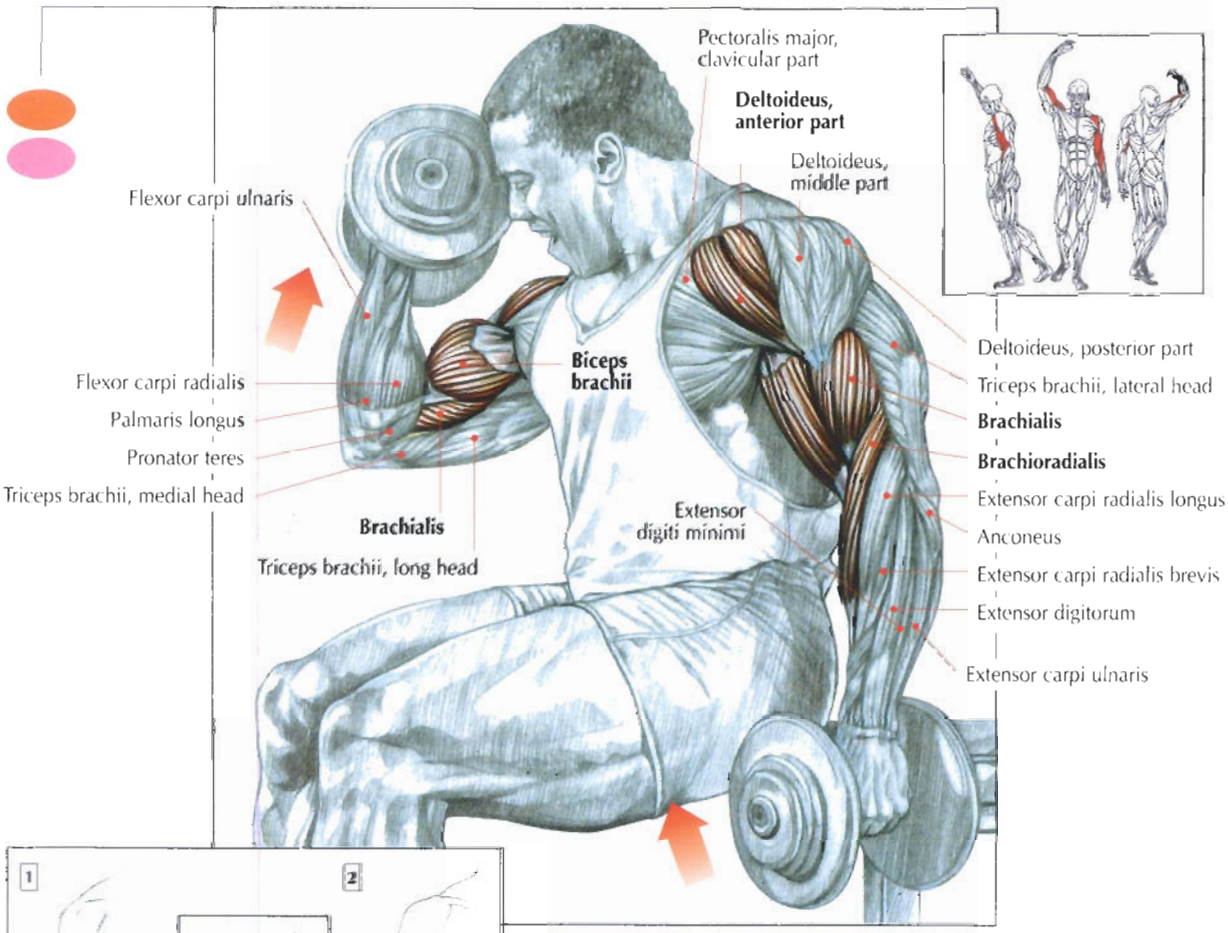
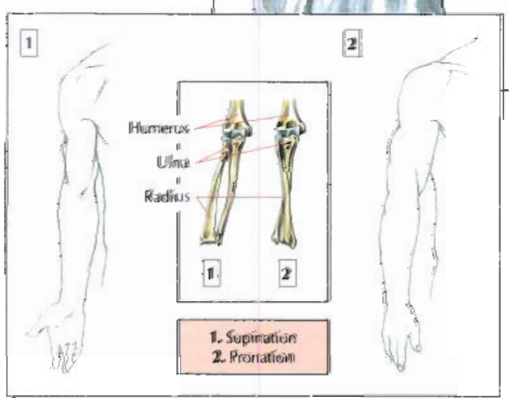


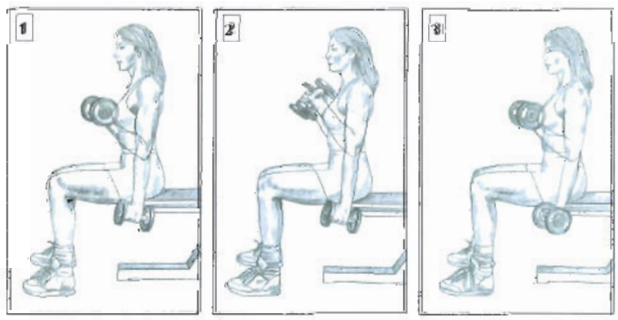
1 CURLS





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 elbow to continue curling the dumbbell

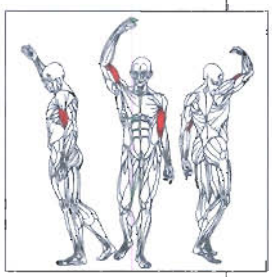
This exercise involves the brachioradialis, brachialis, biceps, anterior deltoids, and, to a lesser extent, the coracobrachialis and upper pectorals.

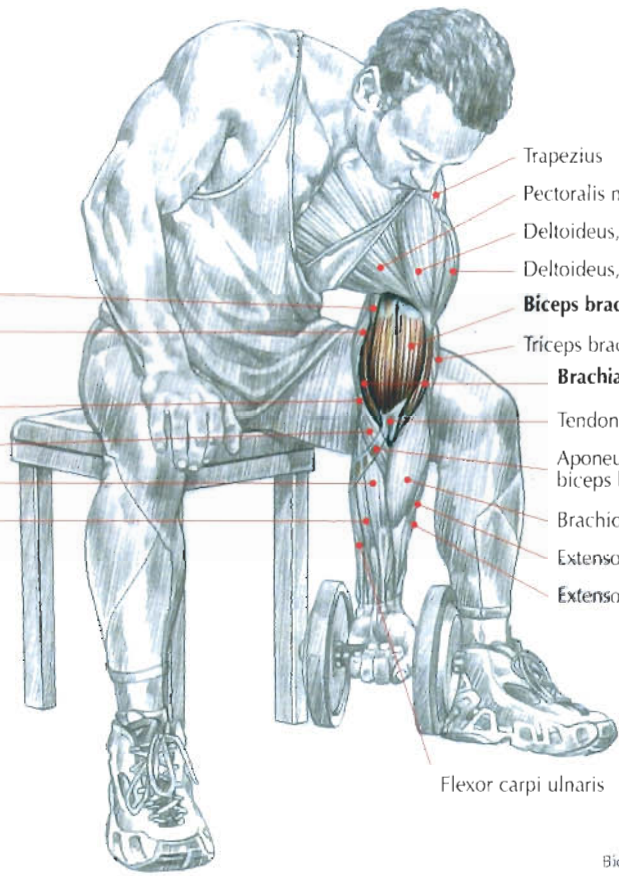


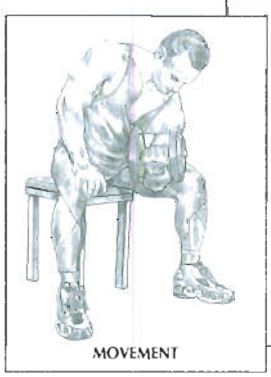
Note: biomechanically, this exercise is excellent for emphasizing the biceps in all its actions (flexion and protraction of the arm and supination).

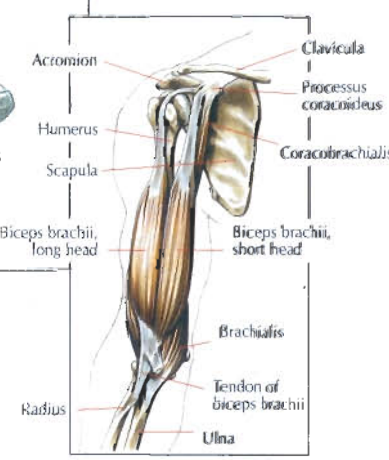
THREE WAYS TO CURL DUMBBELLS:
1. work both the biceps and brachialis
2. mainly work the brachioradialis
3. mainly work the biceps

CONCENTRATION CURLS 2



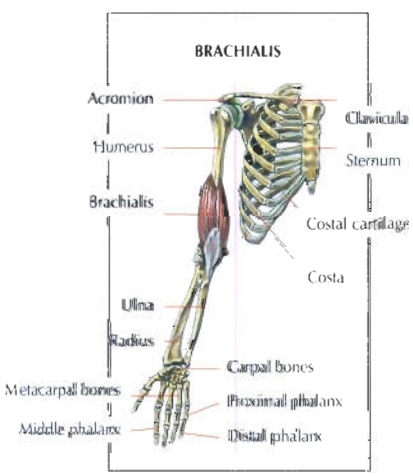




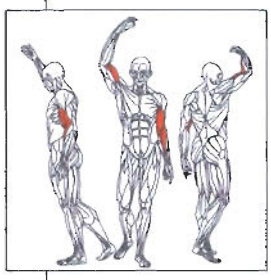


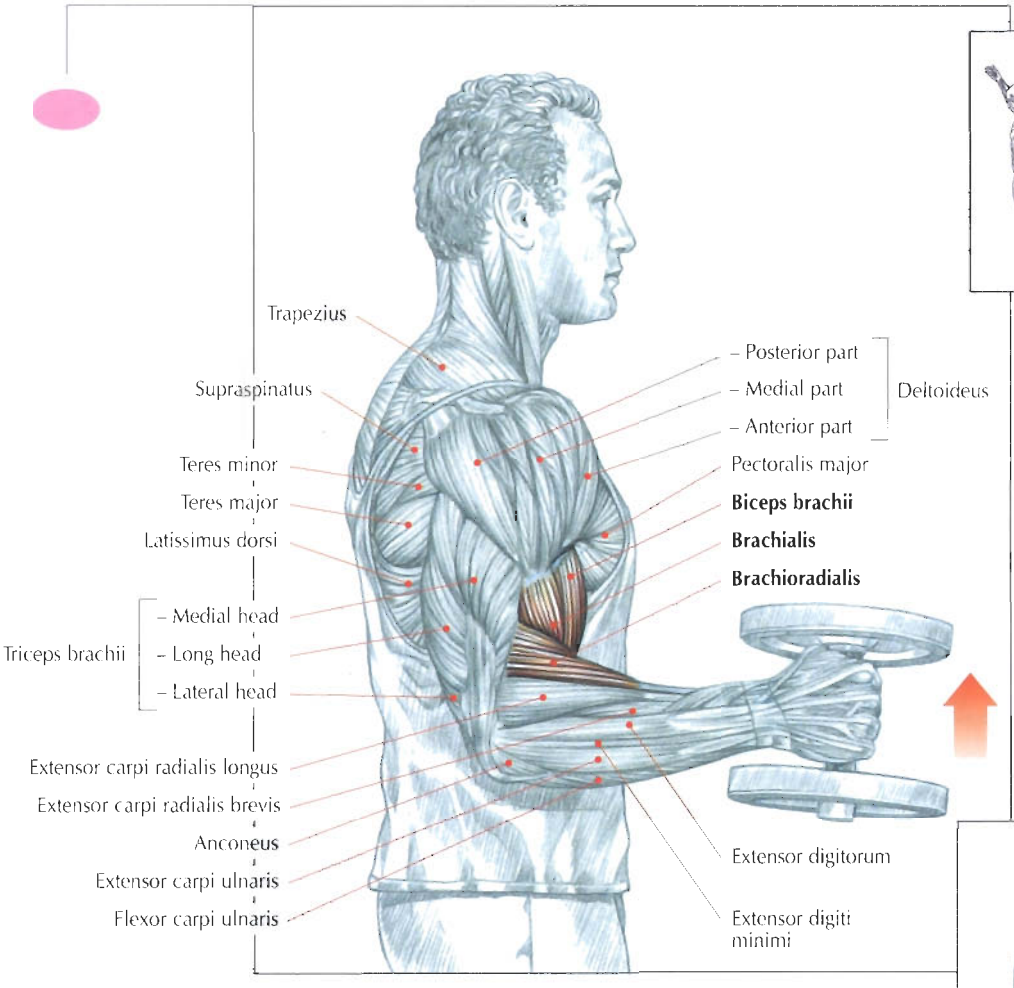
Sit on a bench. Hold a dumbbell with an underhand grip and rest your elbow on the inner side of your thigh:
– Inhale and curl the dumbbell
– Exhale as you complete the movement

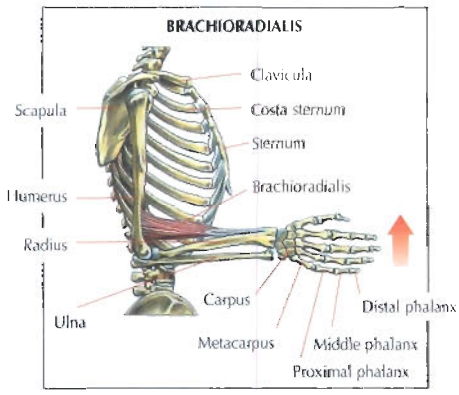
This isolation exercise allows you to control the range, speed, and alignment of the movement. It works mainly the biceps, brachialis, and brachioradialis.



3 HAMMER CURLS

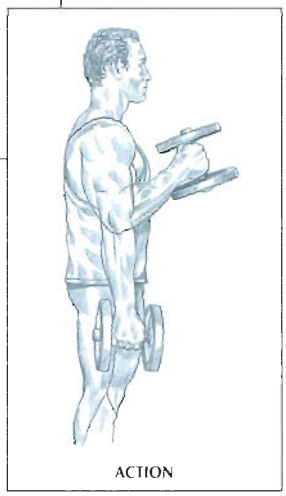




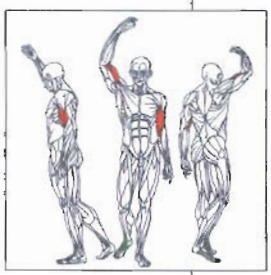


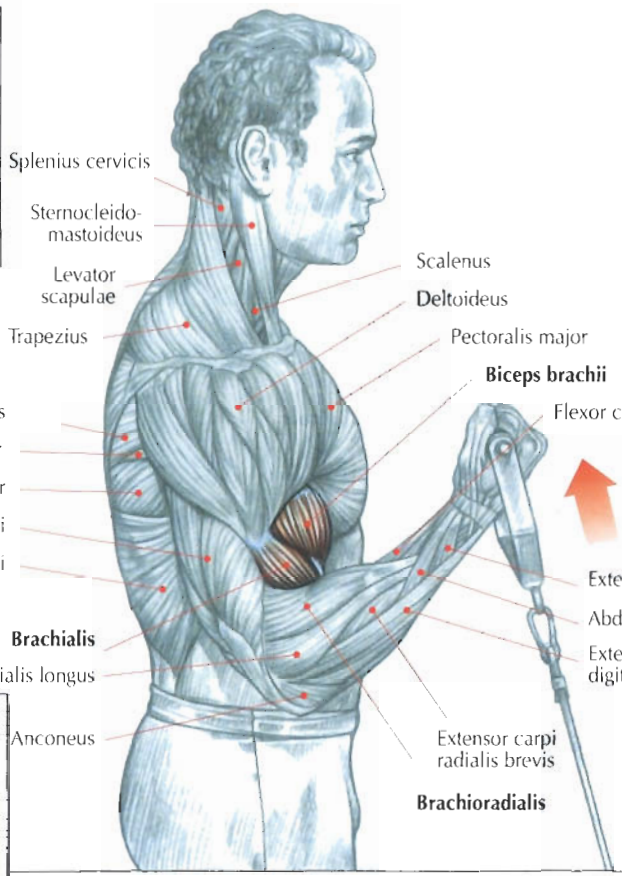
Stand or sit. Grasp a dumbbell in each hand with your palms facing inward:
– Inhale and curl the dumbbells to your shoulders, either simultaneously or alternately
– Exhale as you complete the movement

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



LOW PULLEY CURLS 4

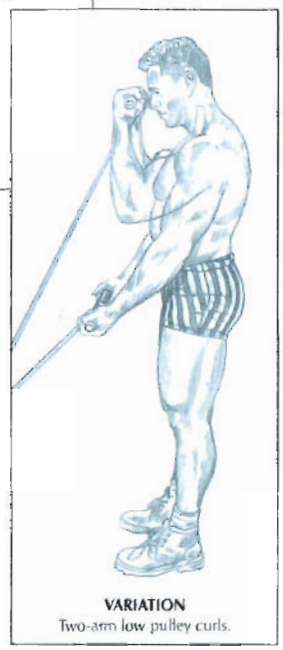




Stand facing the machine and grasp the handle with an underhand grip:
– Inhale and curl the pulley handle
– Exhale as you complete the movement

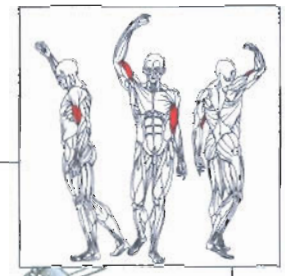
This is a good exercise for isolating and pumping the biceps.

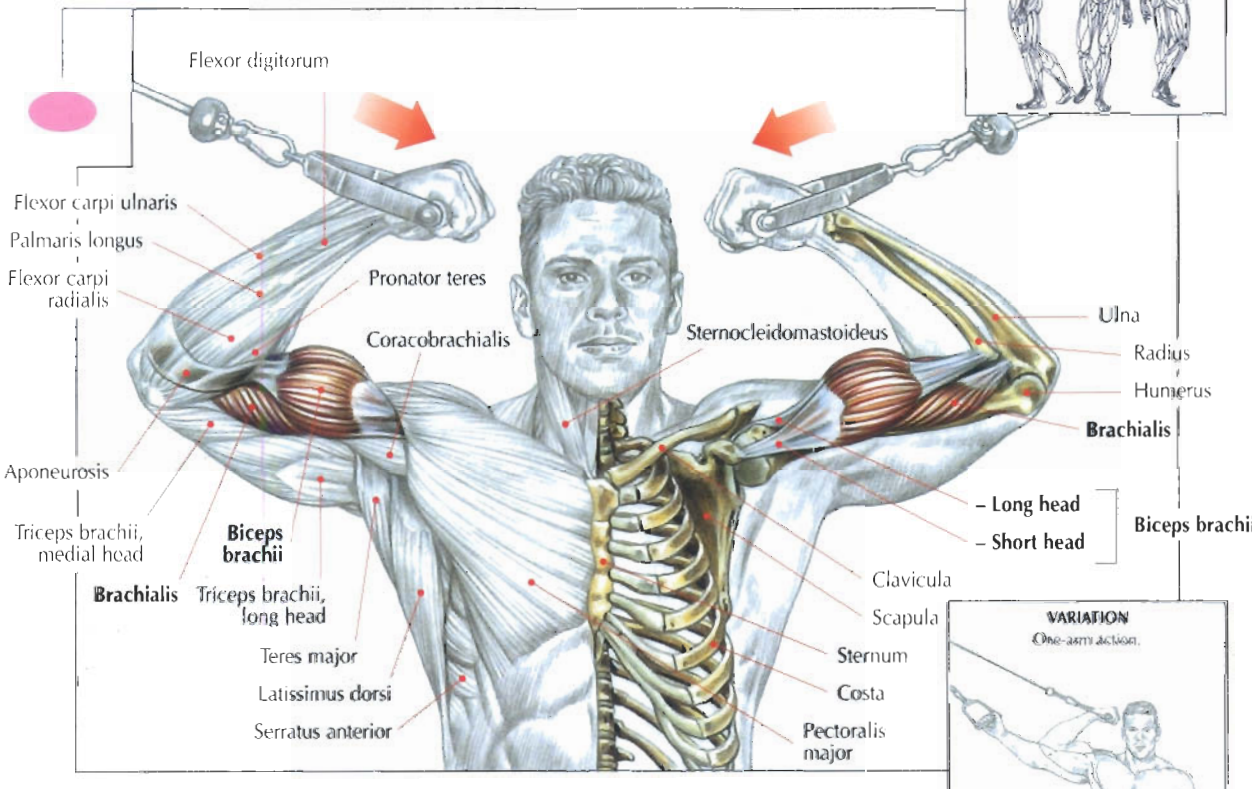
ACTION

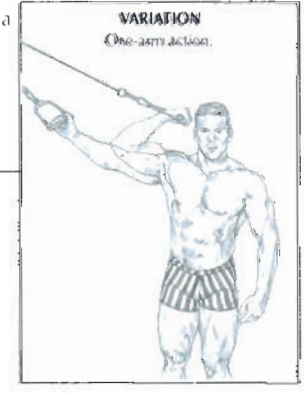


VARIATION
Two-arm low pulley curls.

5 HIGH PULLEY CURLS

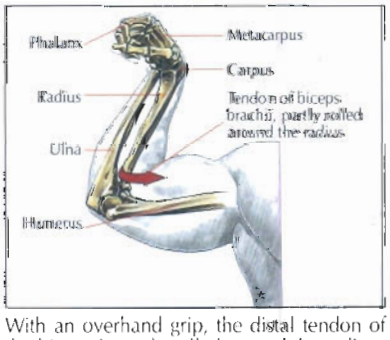




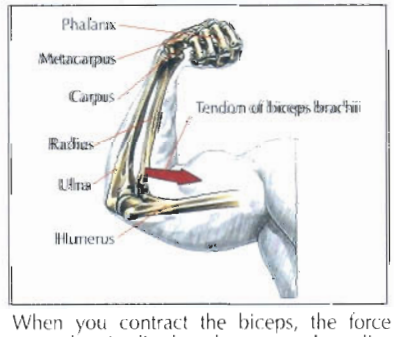


Stand between the pulleys, spread your arms, and grasp the high pulley handles with an underhand grip:
– Inhale and curl the handles toward your head
– Exhale as you complete the movement

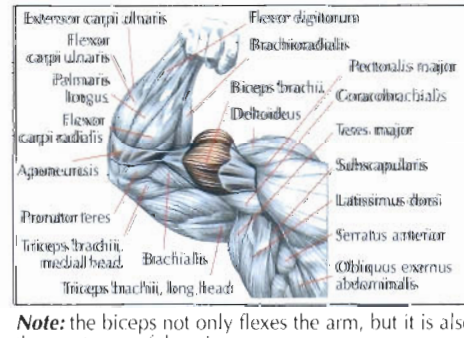
This exercise is mostly used to complete a workout focusing on arm development. It works mainly the biceps—particularly the long head, which is first stretched and tensed while your arms are spread. This exercise also works the brachialis.
Never use heavy weight with this exercise. Concentrate on feeling the proper contraction along the medial part of the biceps.



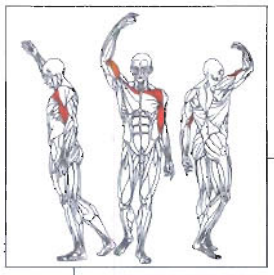
With an overhand grip, the distal tendon of the biceps is partly rolled around the radius.



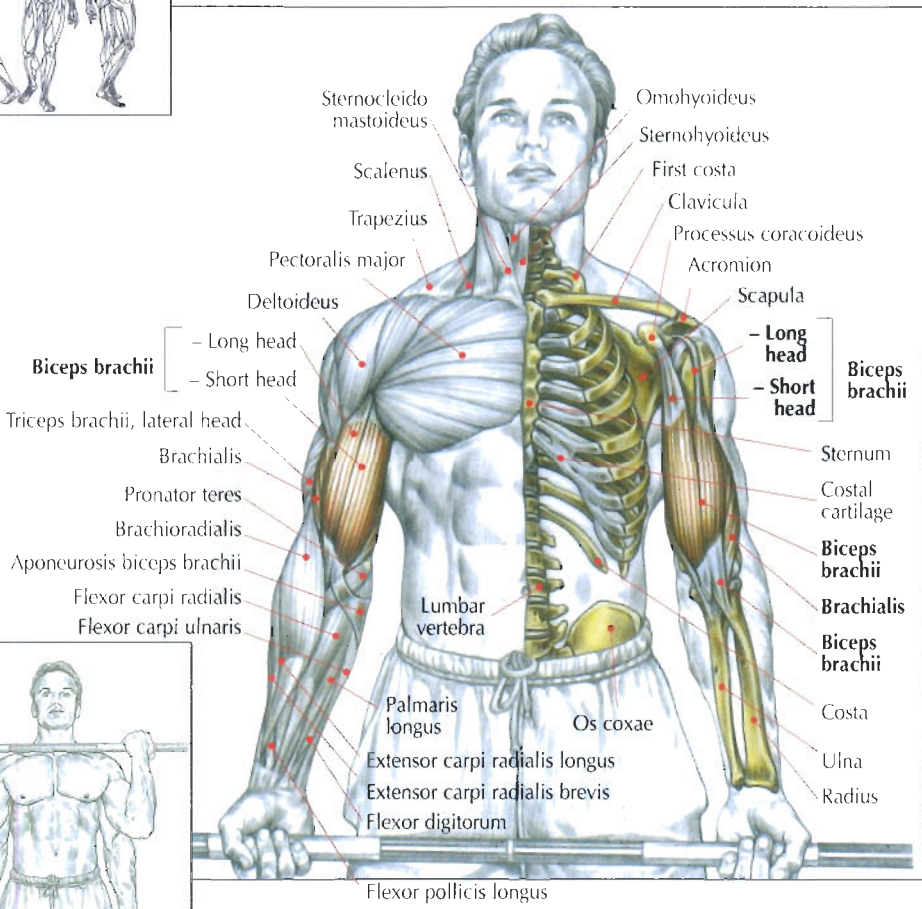
When you contract the biceps, the force exerted on its distal tendon rotates the radius around its axis, bringing the hand to a supinated position.

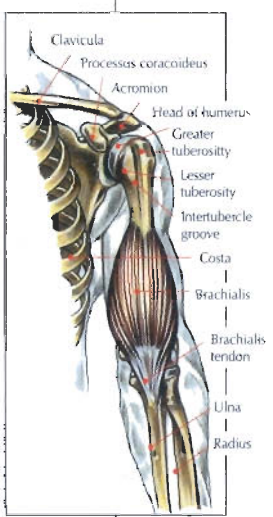


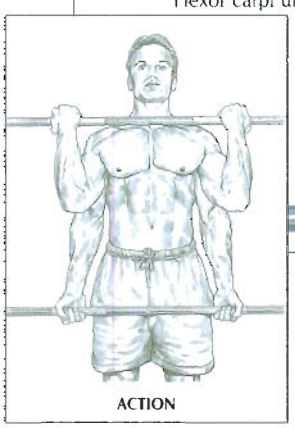
Note: the biceps not only flexes the arm, but it is also the most powerful supinator.



BARBELL CURLS 6







Stand. Keep your back straight and take an underhand grip on the bar with your hands slightly more than shoulder-width apart:
– Inhale, then curl the barbell
– Contract the gluteal, abdominal and back muscles isometrically to avoid torso swing
– Exhale as you complete the movement

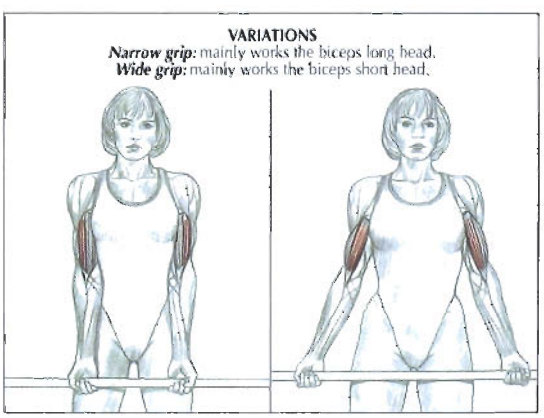
This exercise mainly works the biceps, brachialis, and, to a lesser degree, the brachioradialis, pronator teres, and all the flexors of the wrist and fingers.

Variations:

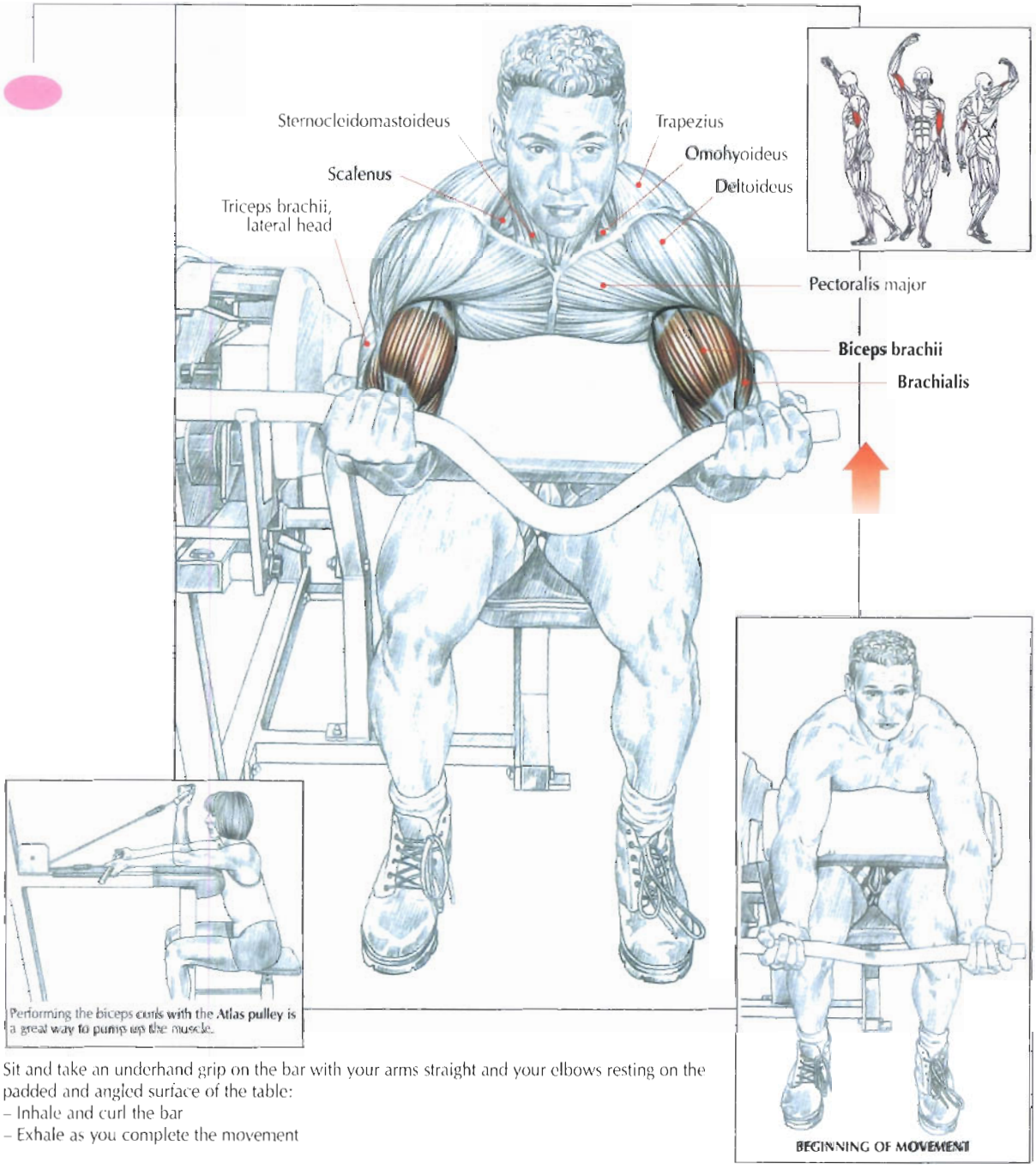
1. Try using various grip widths to more intensely work
– the biceps short head (wide grip) or
– the biceps long head (narrow grip).

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 scapulae (shoulder blades) pressed against the wall.



7 MACHINE CURLS

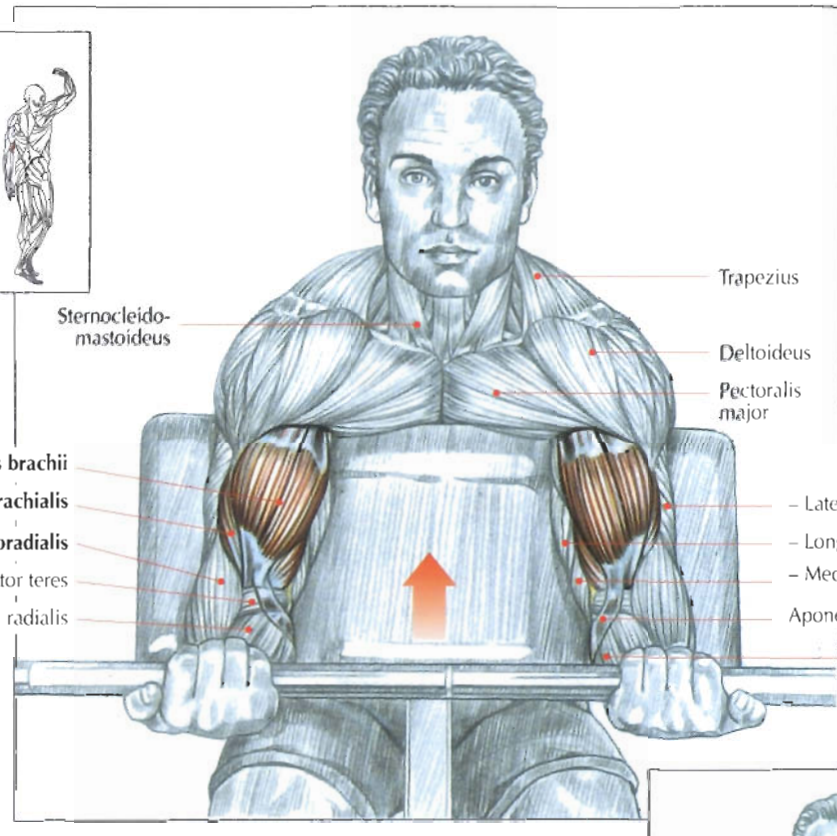


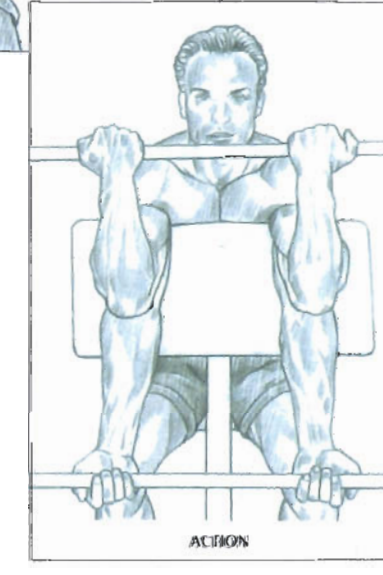
Performing the biceps curls with the Atlas pulley is a great way to pump up the muscle.

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

This is one of the best exercises to feel 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 tendinitis by keeping your arms from extending completely.

PREACHER CURLS 8

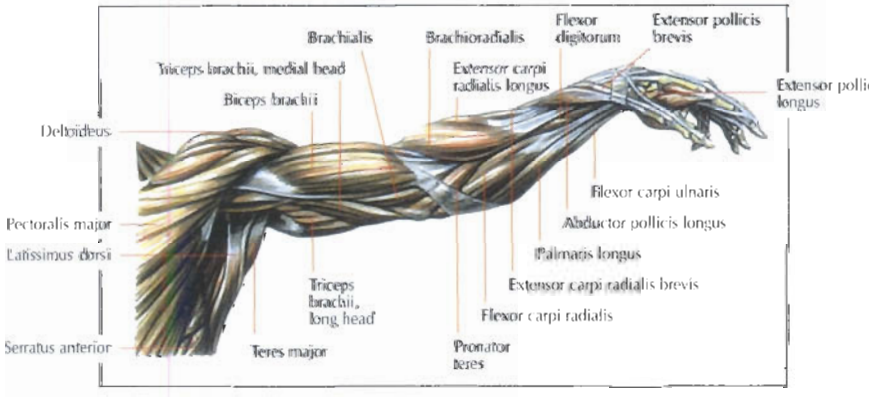




Stand or sit with your arms resting on the bench:
– Inhale and curl the bar
– Exhale as you complete the movement

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.



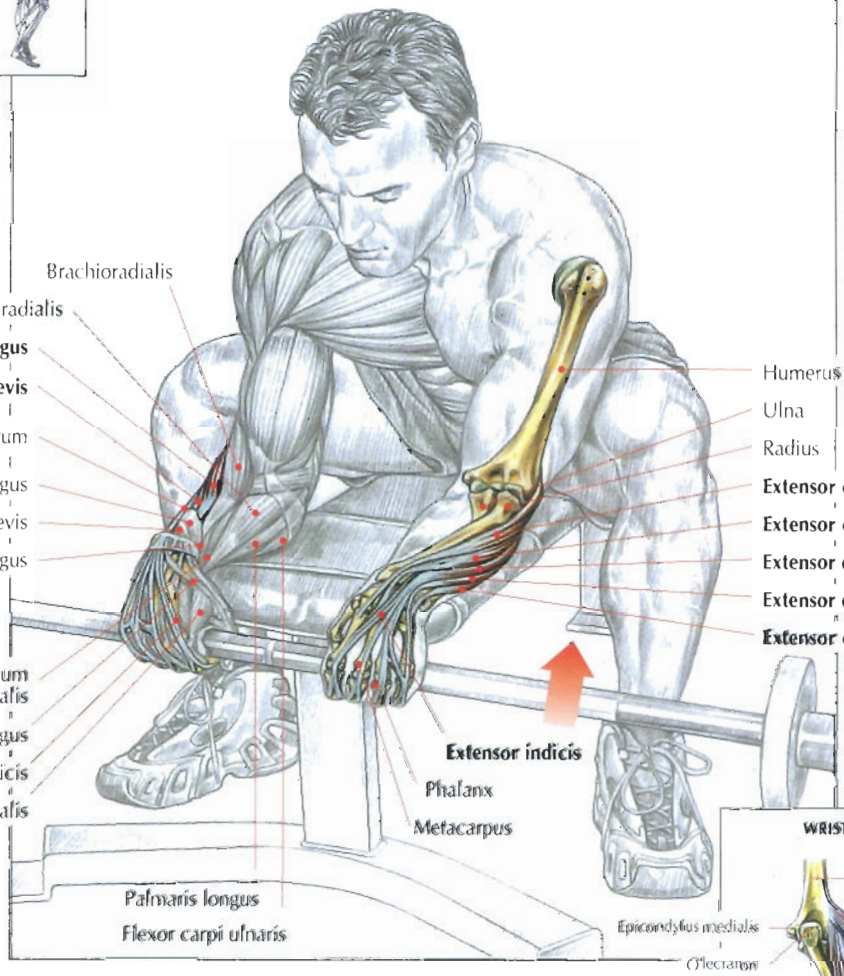
9 REVERSE CURLS

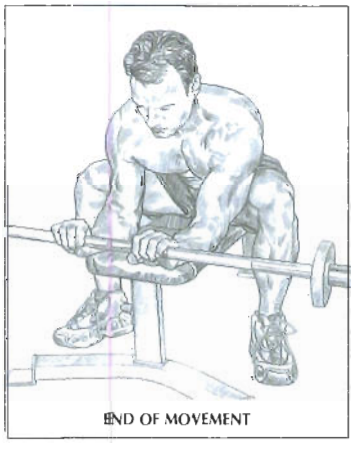
Stand with your feet slightly apart and your arms straight, using an overhand grip (thumbs toward each other):
- Inhale and curl the bar
- Exhale as you complete the movement

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

Note: this is an excellent movement for strengthening the wrist joint. The predominance of the wrist flexors over the wrist extensors often causes imbalance and weakens the wrist. For this reason, this exercise has been integrated into many boxers' training programs. Many bench press champions use it to prevent their wrists from shaking when using heavy weight.

REVERSE WRIST CURLS 10

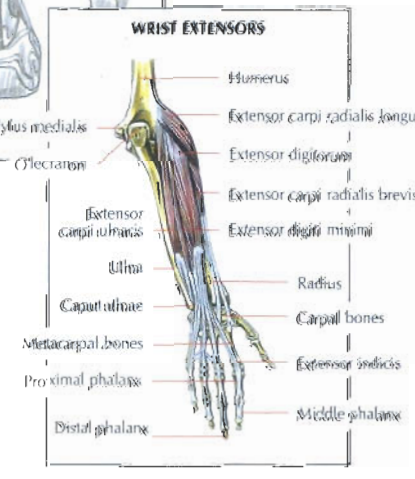




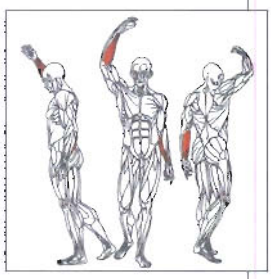
Sit with your forearms resting on your thighs or on a bench. Take an overhand grip on the bar with your wrists passively flexed:
– Curl your wrists back toward you
– Return to the starting position

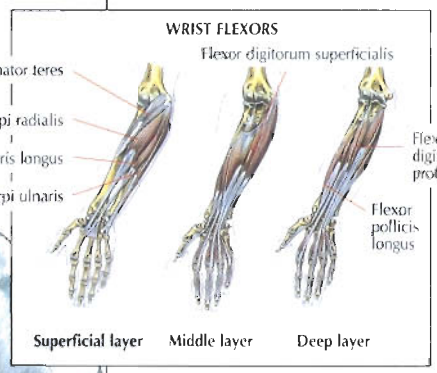
This exercise works the wrist and finger extensors.

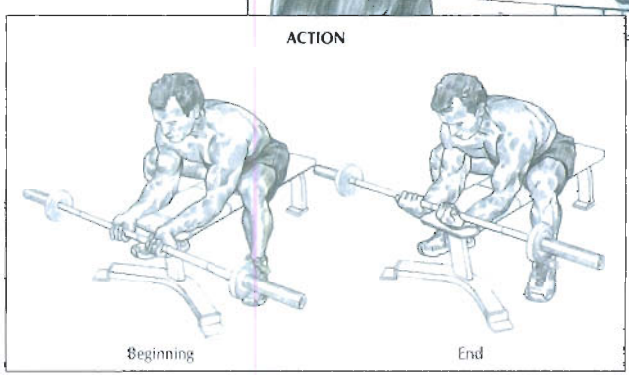
Note: this is an excellent movement for strengthening the wrist, which is often weak because of a lack of strength in the extensor muscles.

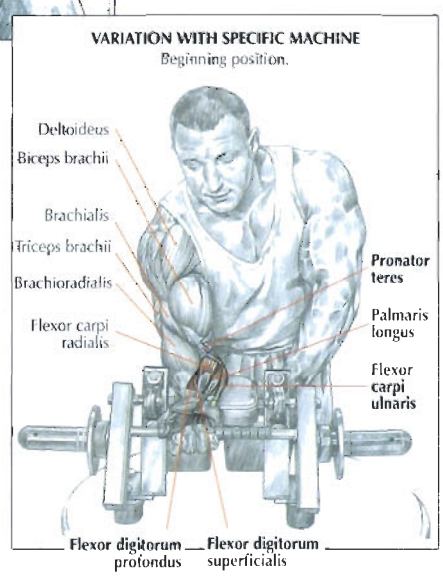


11 WRIST CURLS





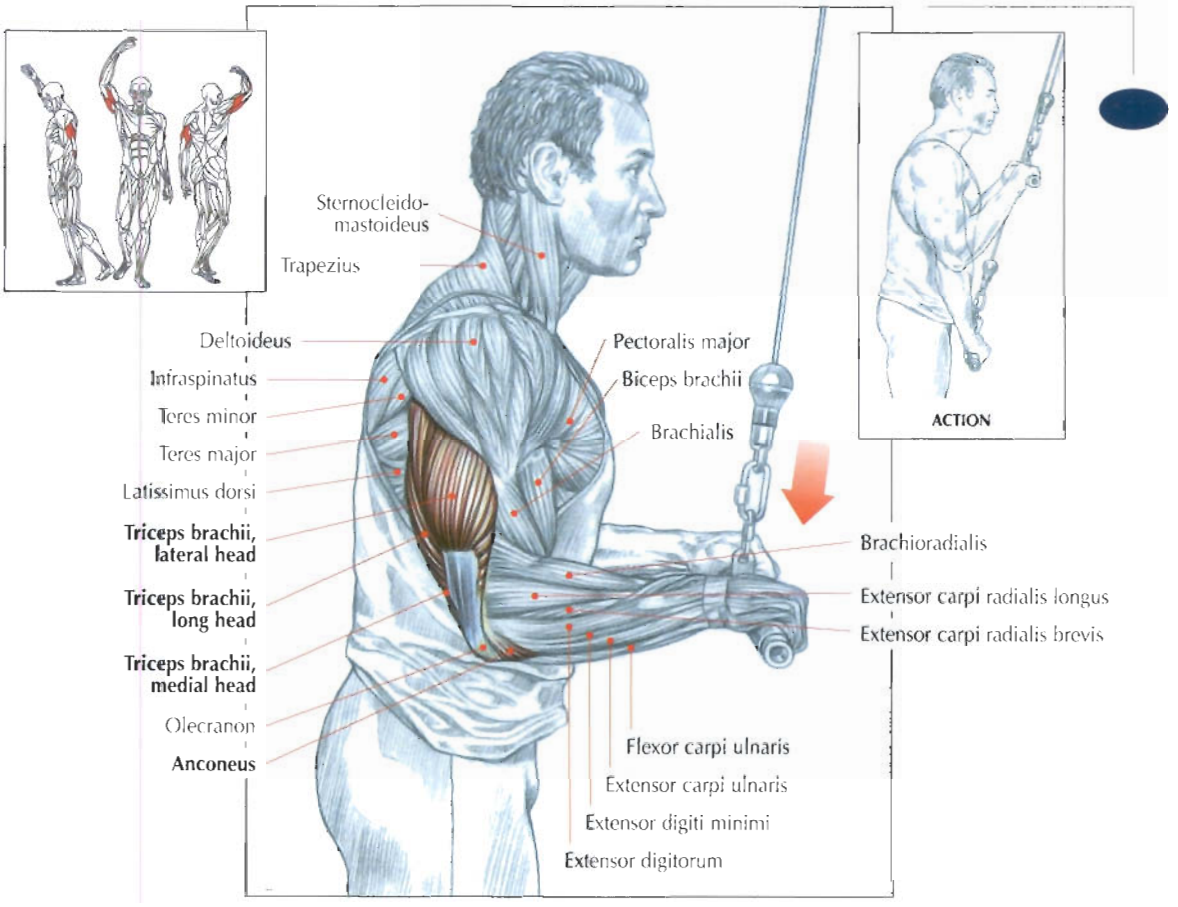




Sit with your forearms resting on your thighs or on a bench. Take an underhand grip on the bar with your wrists passively extended:
- Inhale and curl your wrists up
- Exhale as you complete the movement

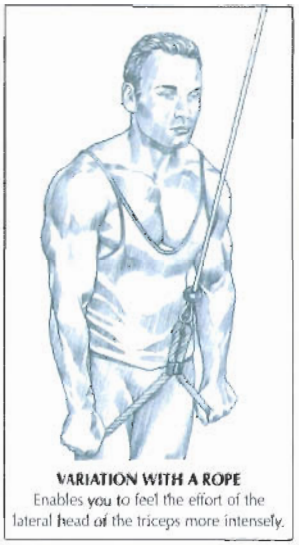
This exercise works the flexors of the wrist and fingers. The flexors of the fingers, although deeply situated, are the largest of the flexor muscles.

PUSHDOWNS 12

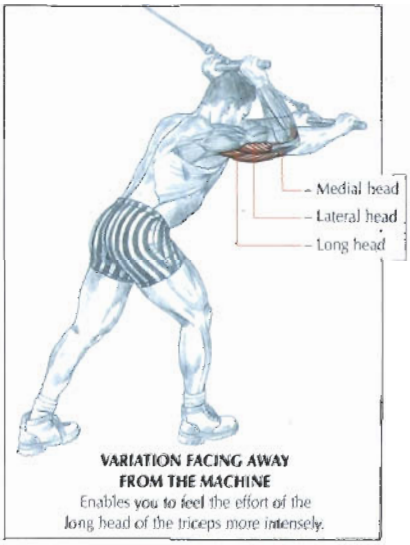


Stand facing the machine with your hands on the bar and your elbows against your sides:
- Inhale and straighten your arms, but don't separate your elbows from your sides
- Exhale as you complete the movement

This isolation exercise works the triceps and the anconeus.
You can perform an effective variation of this movement with a rope instead of the bar to work the lateral head of the triceps more intensely. Use an underhand grip to place emphasis on the medial head of the triceps.
At the end of the movement, hold an isometric contraction for one or two seconds to feel the effort more intensely.
If you use 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 to more difficult exercises.

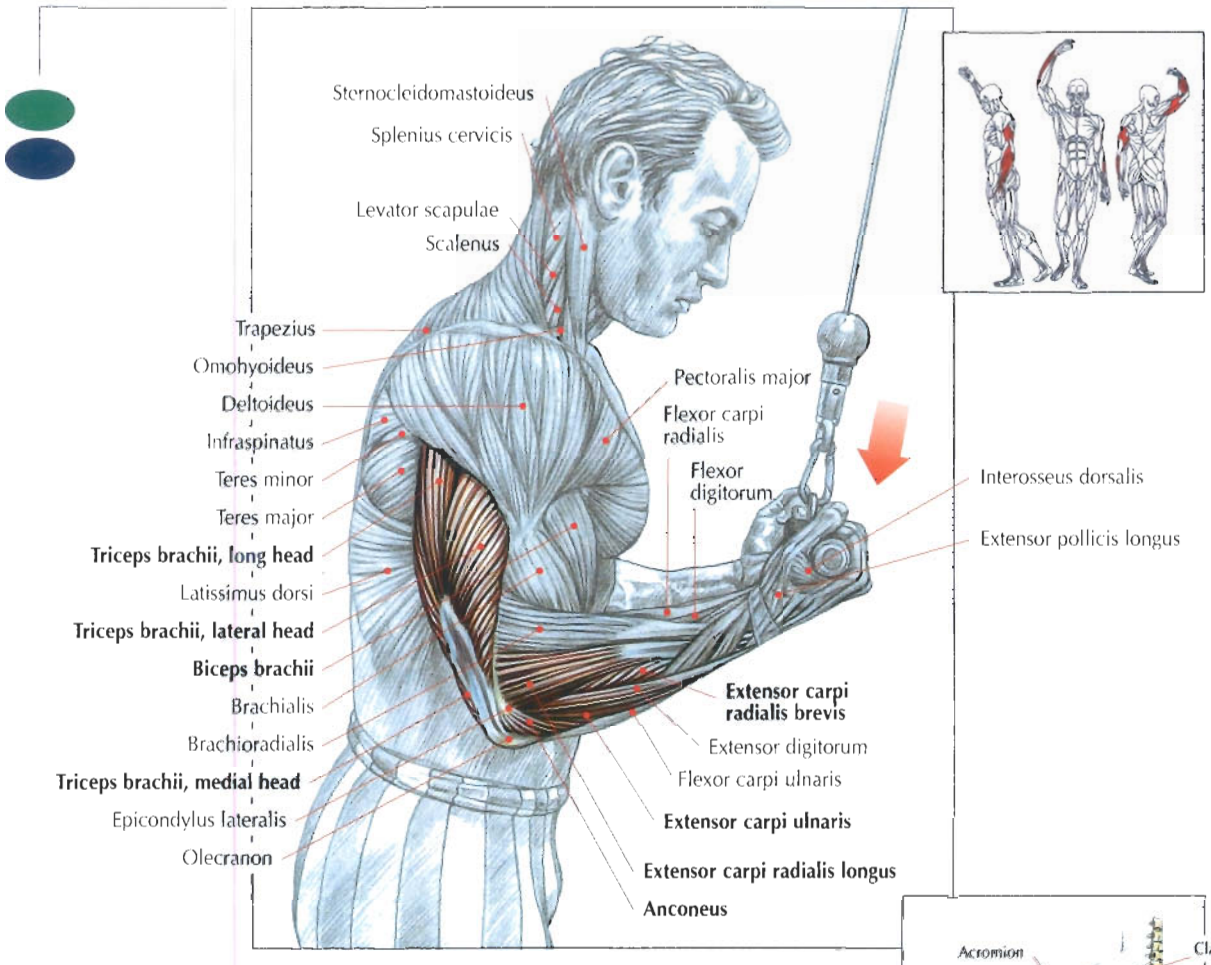


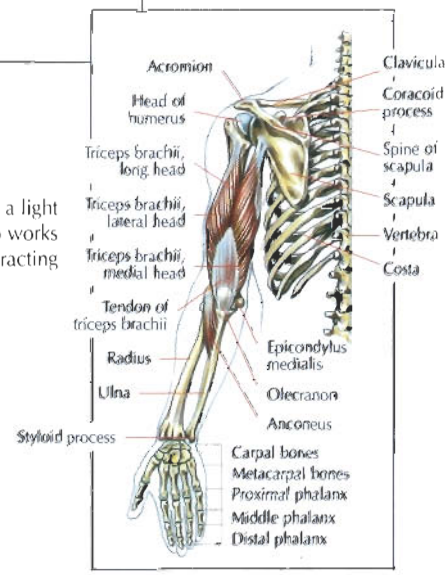
VARIATION WITH A ROPE
Enables you to feel the effort of the lateral head of the triceps more intensely.



VARIATION FACING AWAY FROM THE MACHINE
Enables you to feel the effort of the long head of the triceps more intensely.

13 REVERSE PUSHDOWNS

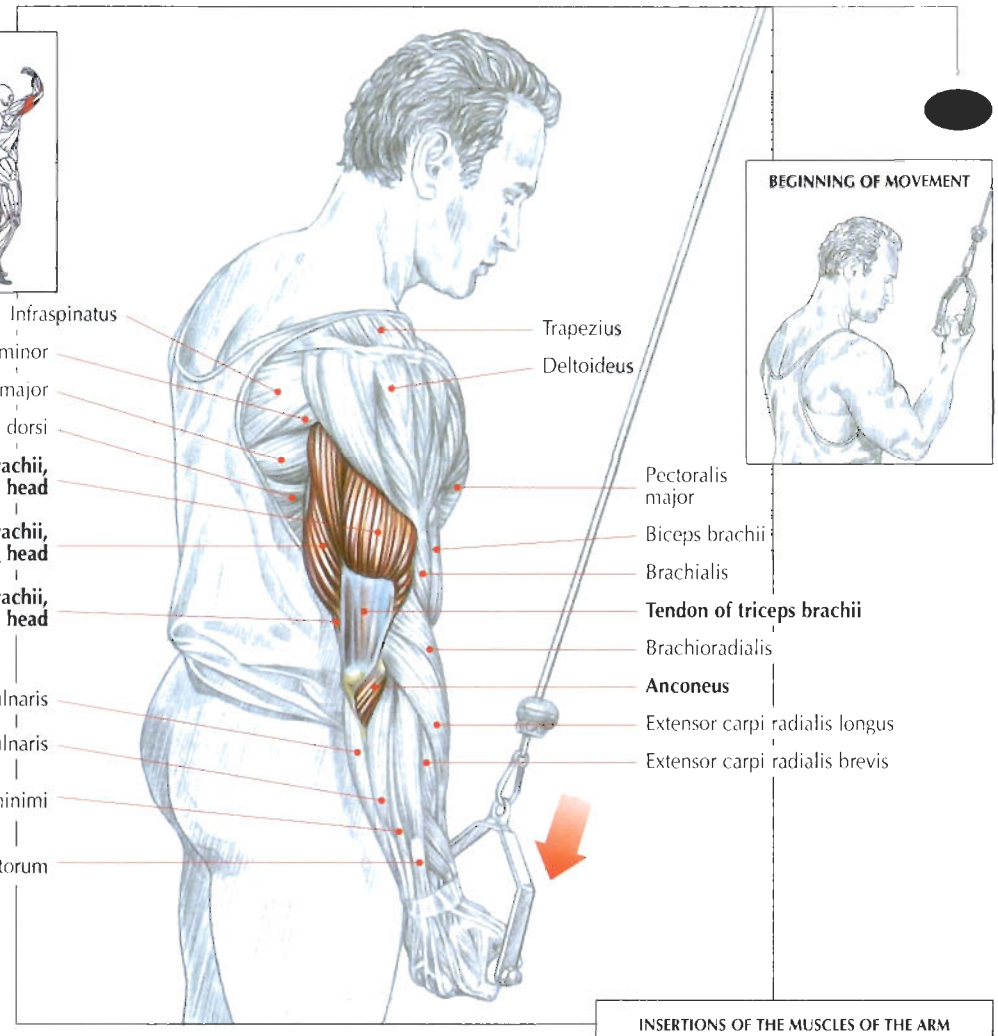




Stand facing the machine with your hands on the bar and elbows flexed against your sides:
- Inhale and straighten your arms; don't separate your elbows from your sides
- Exhale as you complete the movement

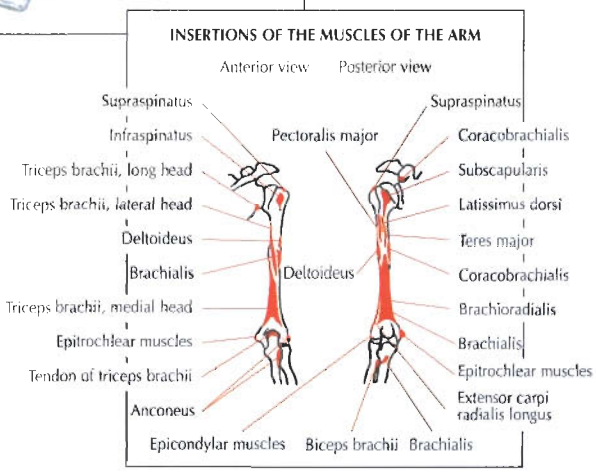
The underhand grip doesn't allow you to work with a heavy weight. Perform the exercise with a light weight in order to work the triceps and focus on the medial head. The forearm extension also works the anconeus and the wrist extensors. The wrist extensors and fingers stabilize the wrist by contracting isometrically during the action.

ONE-ARM REVERSE PUSHDOWNS 14

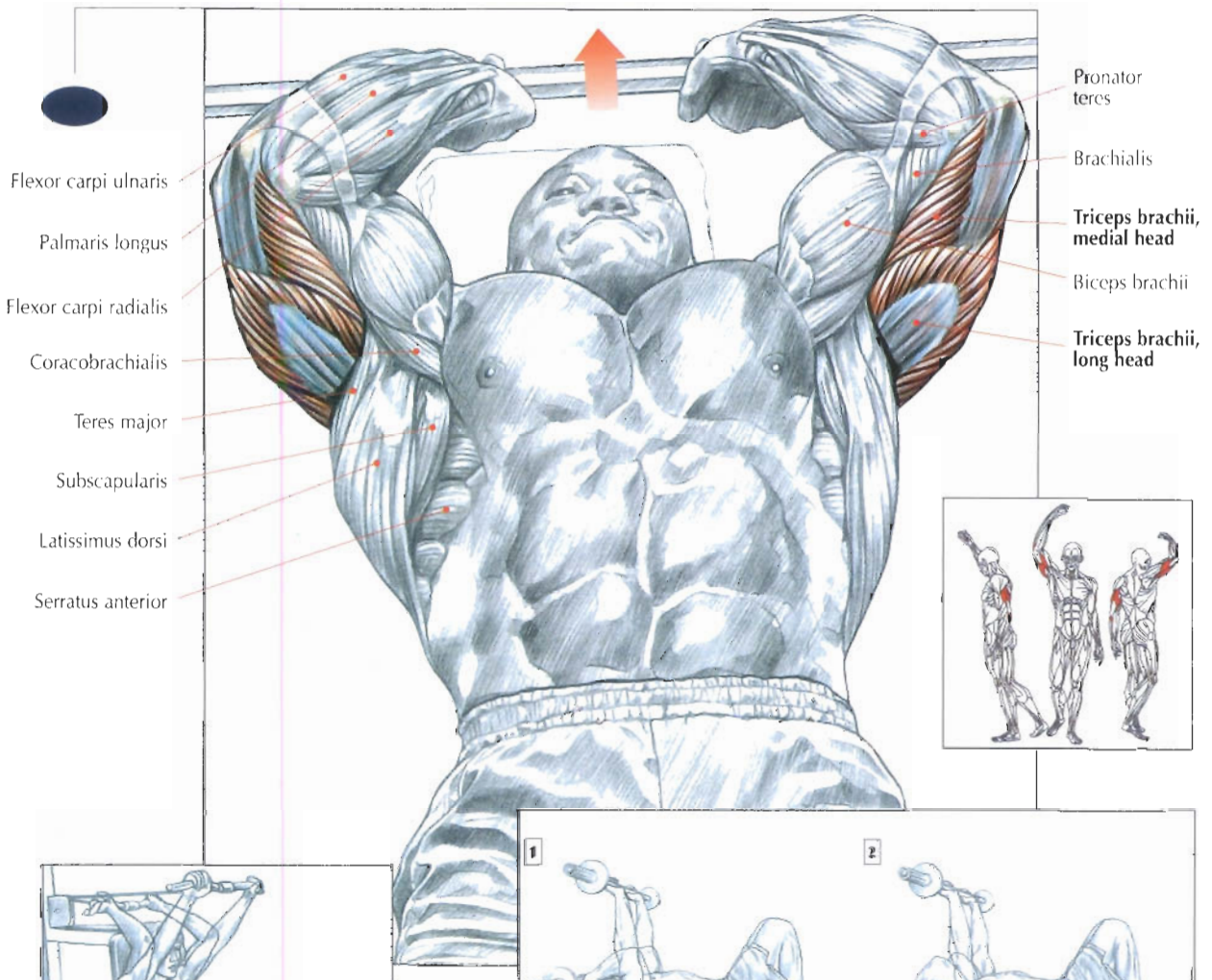


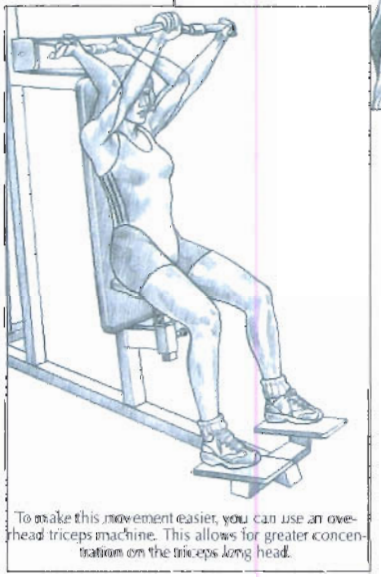
Stand facing the machine and grasp the handle with an underhand grip:
– Inhale and straighten your arm
– Exhale as you complete the movement

This exercise works the triceps.



15 TRICEPS EXTENSIONS





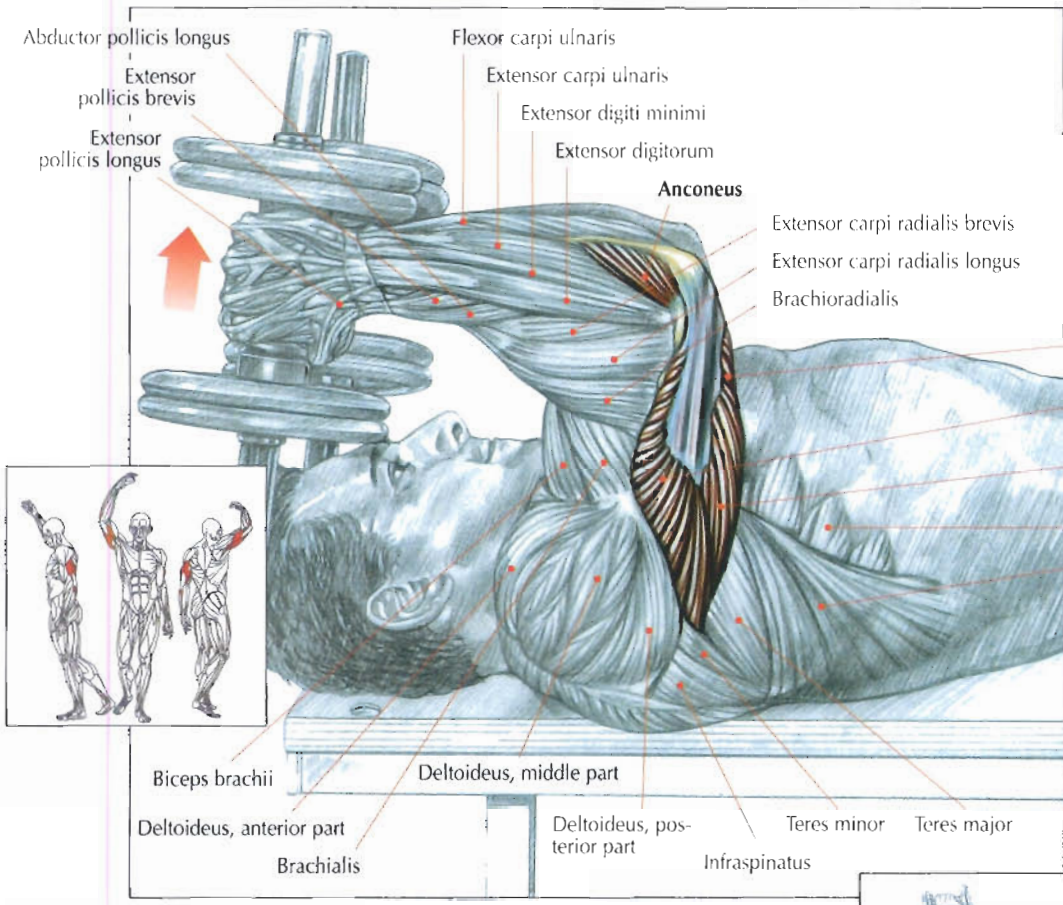
To make this movement easier, you can use an overhead triceps machine. This allows for greater concentration on the triceps long head.

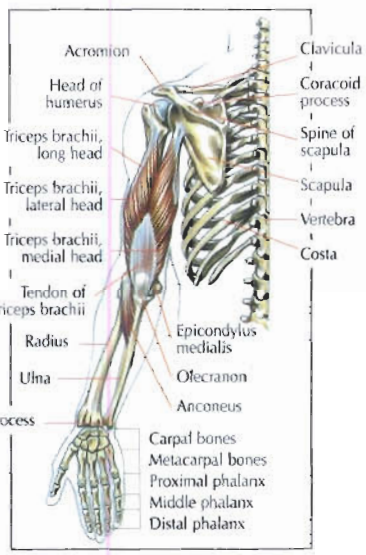
VARIATIONS
1. Lower the bar toward your forehead to work primarily the medial and lateral heads of the triceps.
2. Lower the bar behind your head to work primarily the long head of the triceps.

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

This fundamental movement is excellent for developing larger triceps.

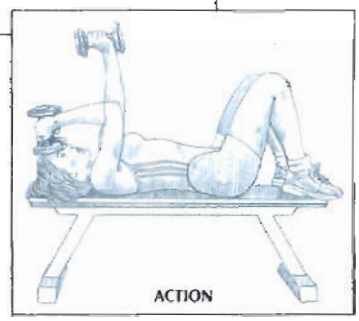
DUMBBELL TRICEPS EXTENSIONS 16



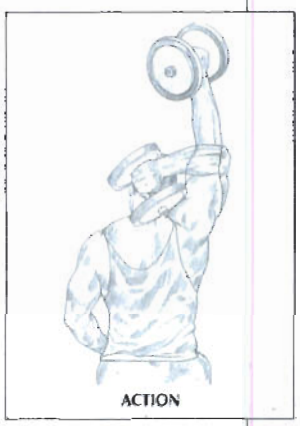


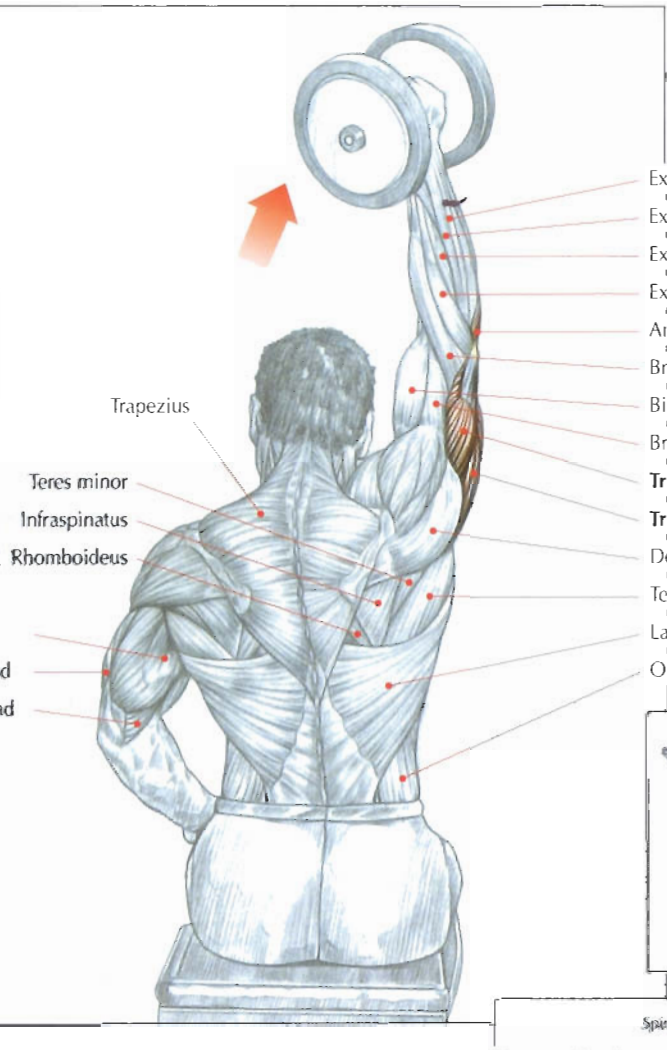
Lie on a flat bench holding a dumbbell in each hand with your arms extended straight up from your shoulders:
– Inhale and slowly bend your arms
– Return to the starting position, exhaling as you complete the movement

This exercise equally works all three heads of the triceps.



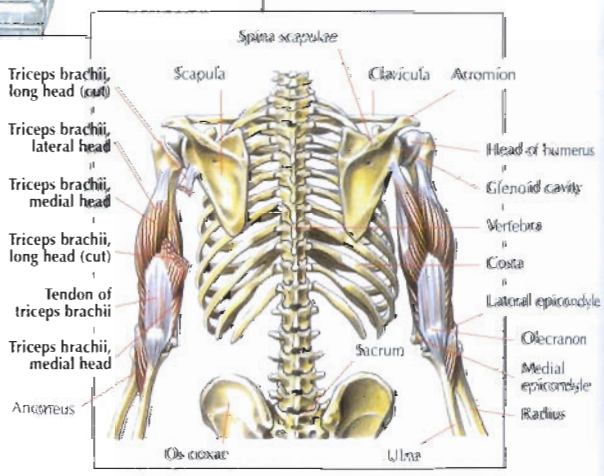
17 ONE-ARM DUMBBELL TRICEPS EXTENSIONS



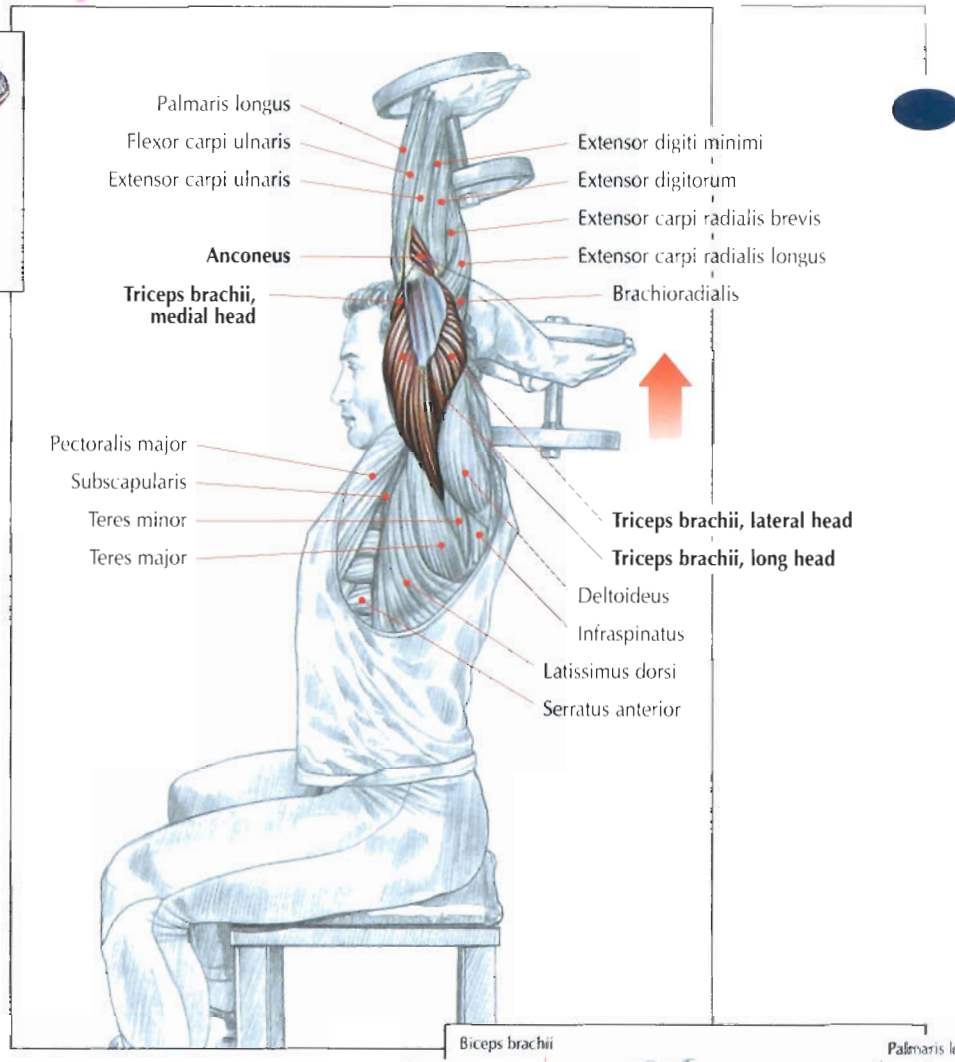


Stand or sit holding a dumbbell in one hand with your arm extended upward:
– Inhale and bend your elbow to lower the dumbbell behind your neck
– Return to the starting position, exhaling as you complete the movement

Note the upright position of the arm stretches the long head of the triceps, favoring its contraction in the movement.

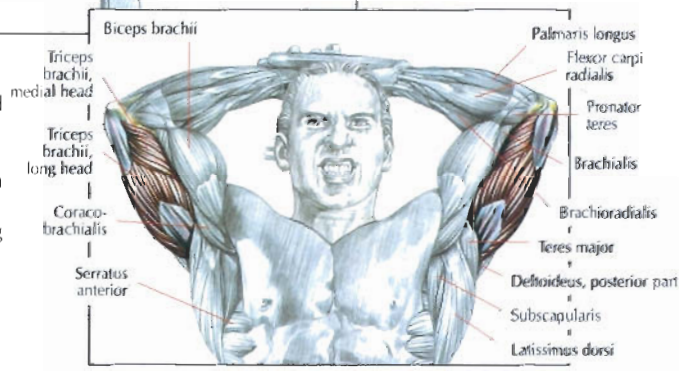


SEATED DUMBBELL TRICEPS EXTENSIONS 18

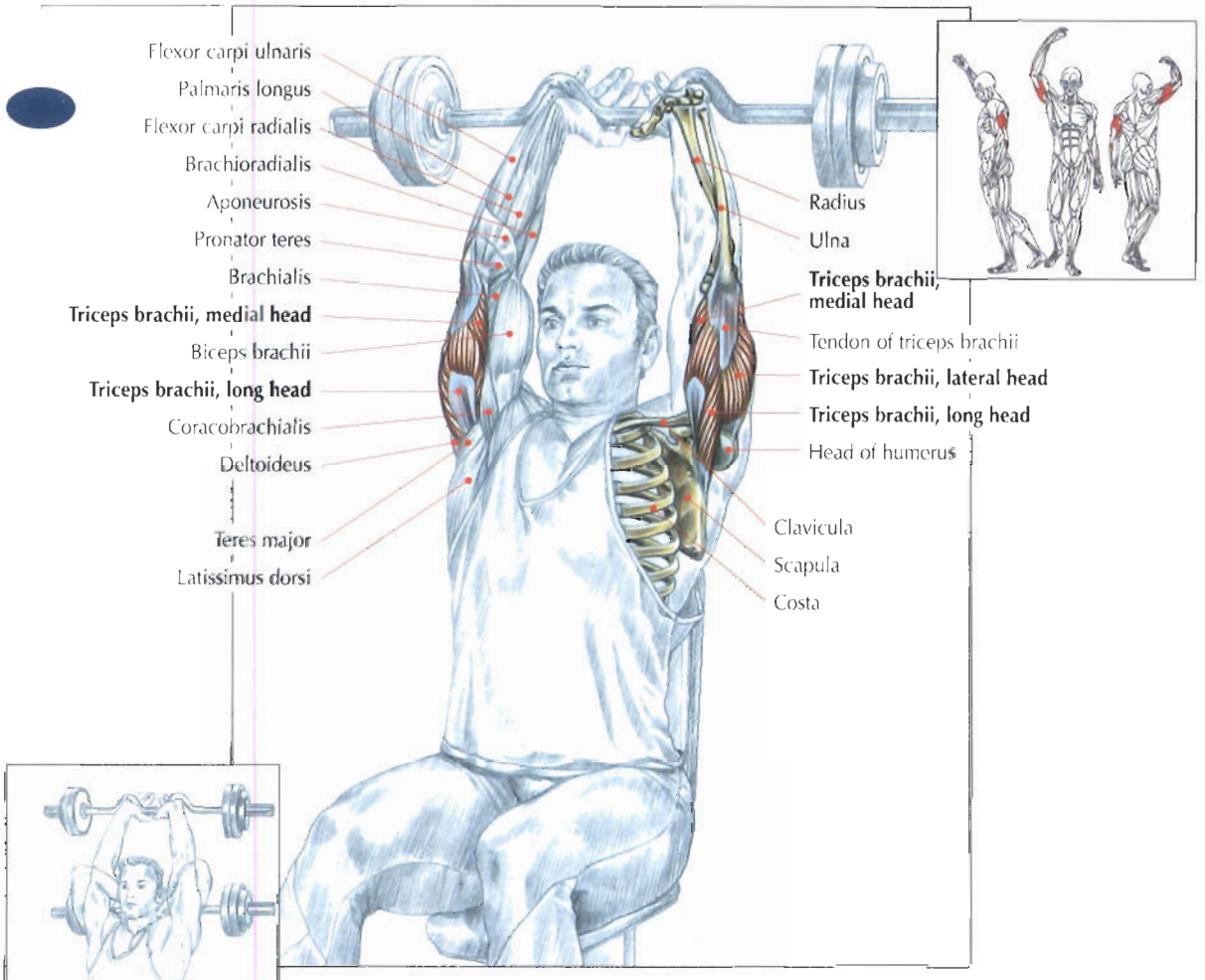


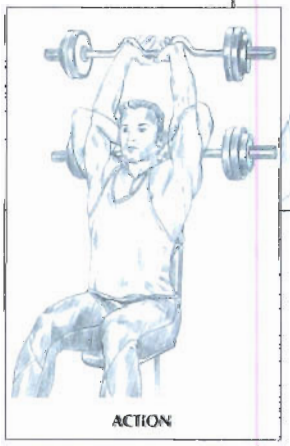
Sit holding the dumbbell in both hands behind your neck:
– Inhale and extend your arms straight until they are above your head
– Exhale as you complete the movement

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.



19 SEATED EZ-BAR TRICEPS EXTENSIONS

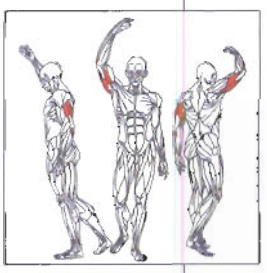


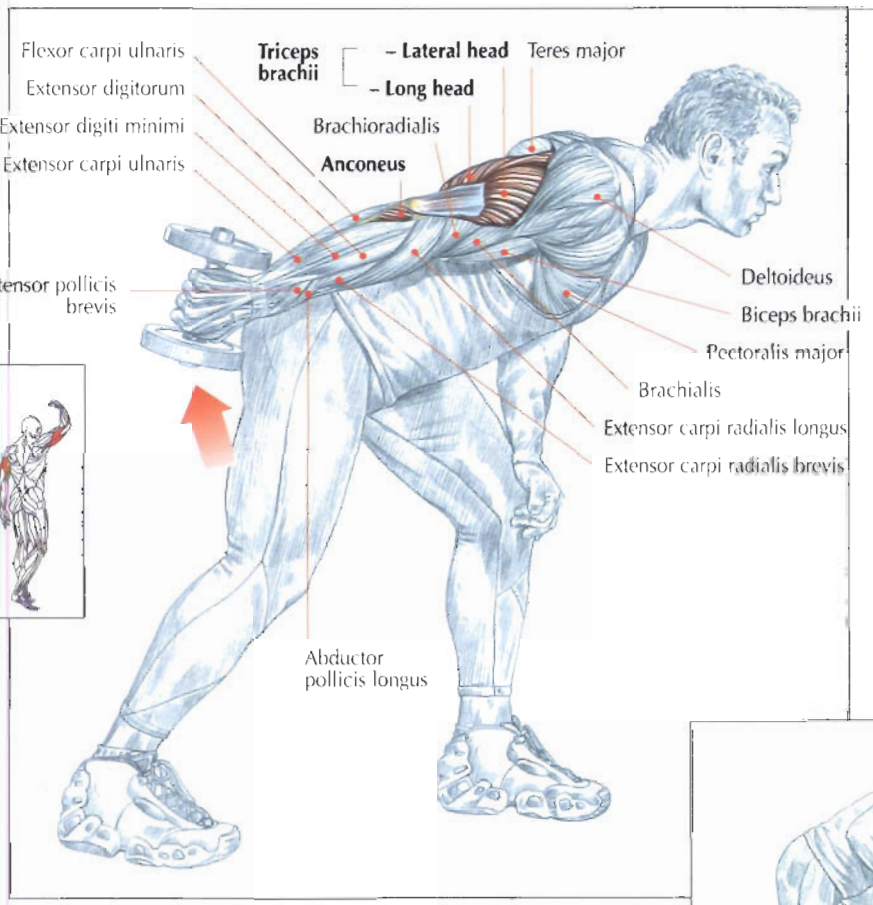


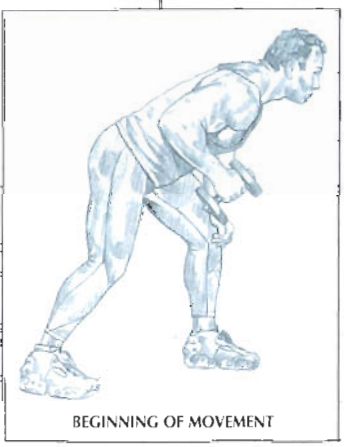
Stand or sit, taking an overhand grip on the bar with your arms extended upward:
– Inhale and bend your elbows to lower the bar behind your neck
– Return to the starting position, exhaling as you complete the extension

The vertical position of the arms intensely 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 20





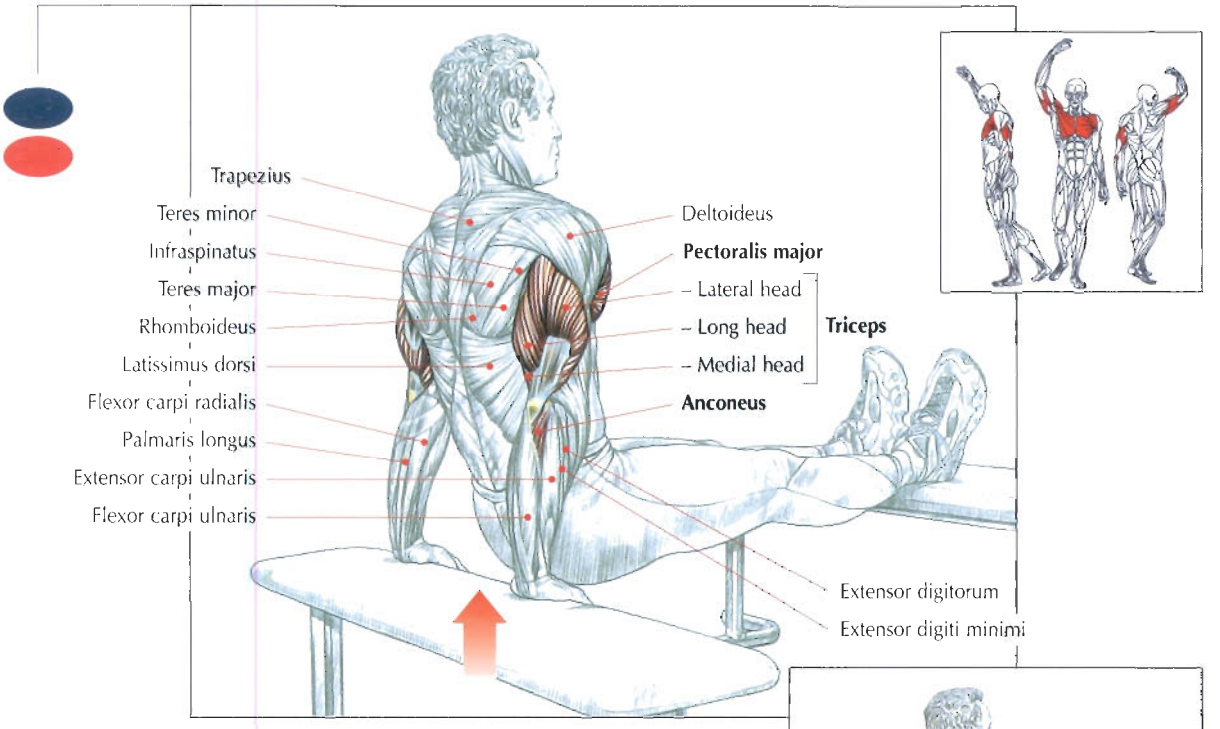


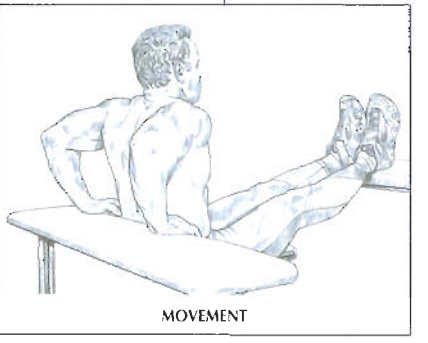
BEGINNING OF MOVEMENT

Stand with your knees slightly flexed, 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 and straighten your arm
– Exhale 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.

21 TRICEPS DIPS



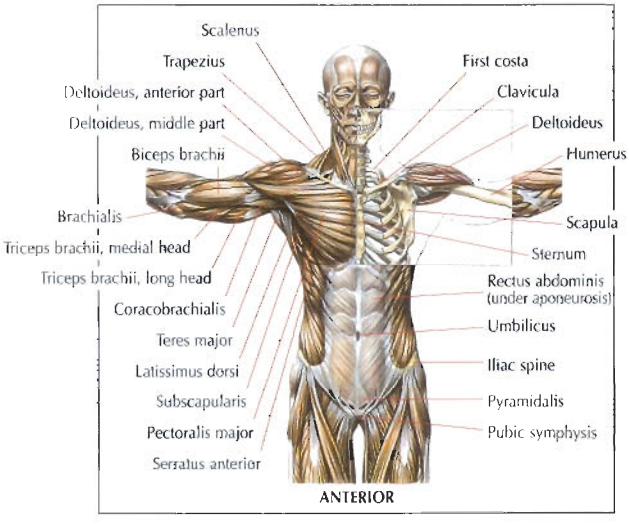


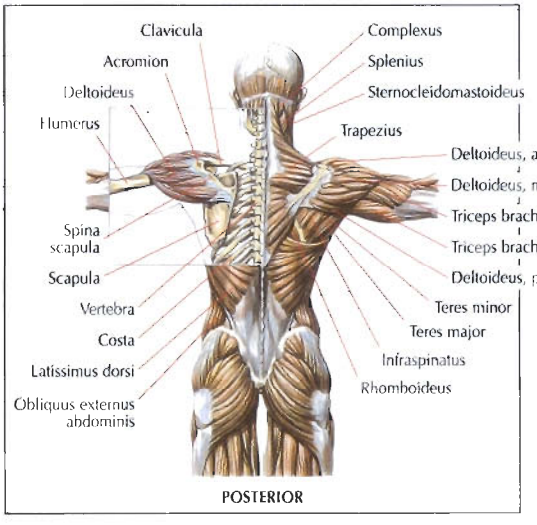
Place your hands on the edge of a flat bench and rest your feet on another bench. Assume a torso-leg angle of about 90 degrees:
– Inhale and bend your arms
– Straighten your arms to return to the starting point, exhaling as you complete the movement

This exercise works the triceps, pectorals, and anterior deltoids.
Placing a weight on your thighs increases the difficulty and intensifies the effort.

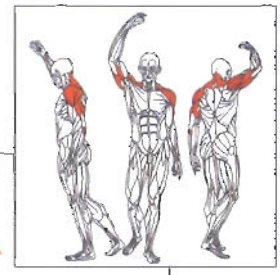
2 SHOULDERS

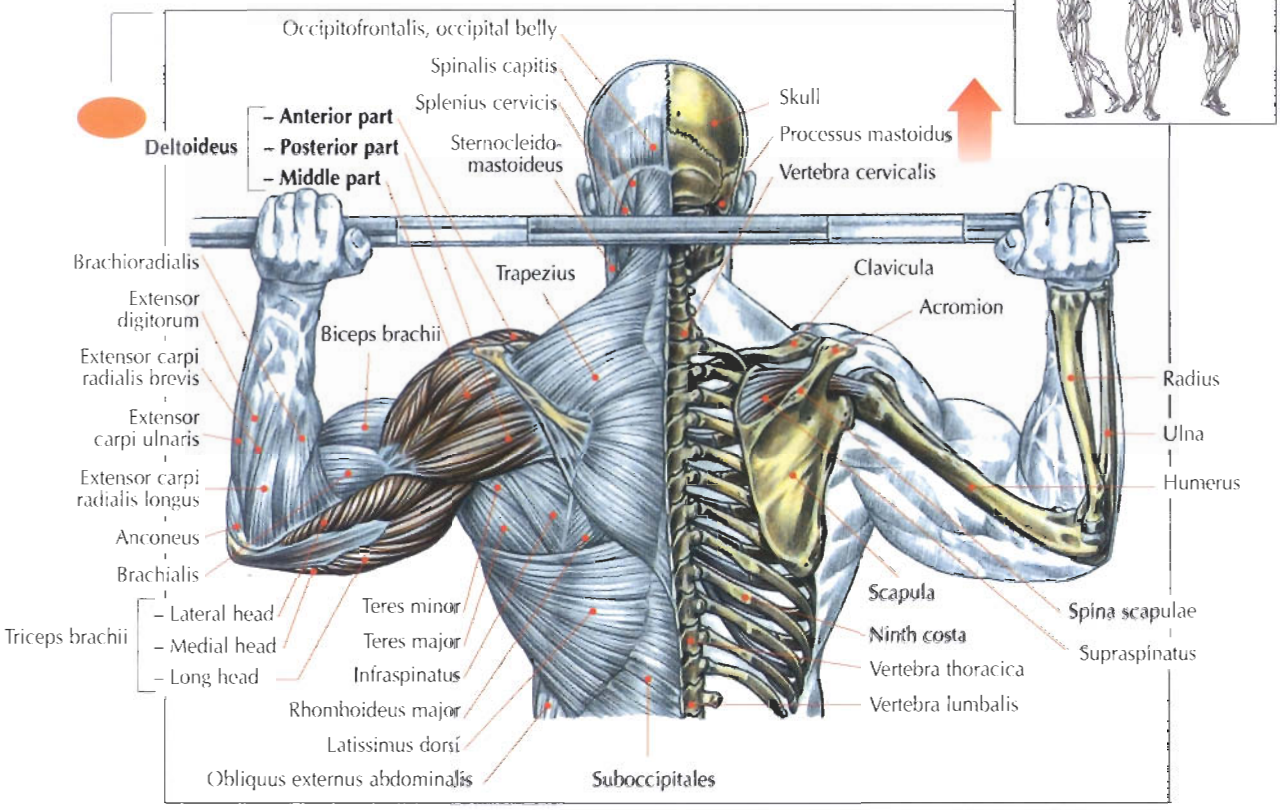
1. Back Press
2. Front Press
3. Dumbbell Press
4. One-Arm Dumbbell Press
5. Lateral Raises
6. Bent-Over Lateral Raises
7. Front Raises
8. Side-Lying Lateral Raises
9. Low Pulley Lateral Raises
10. Low Pulley Front Raises
11. Low Pulley Bent-Over Lateral Raises
12. One-Dumbbell Front Raises
13. Barbell Front Raises
14. Upright Rows
15. Nautilus Lateral Raises
16. Pec Deck Rear Delt Laterals

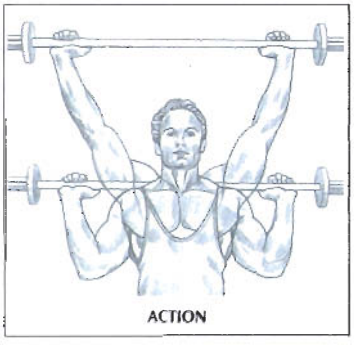




1 BACK PRESS





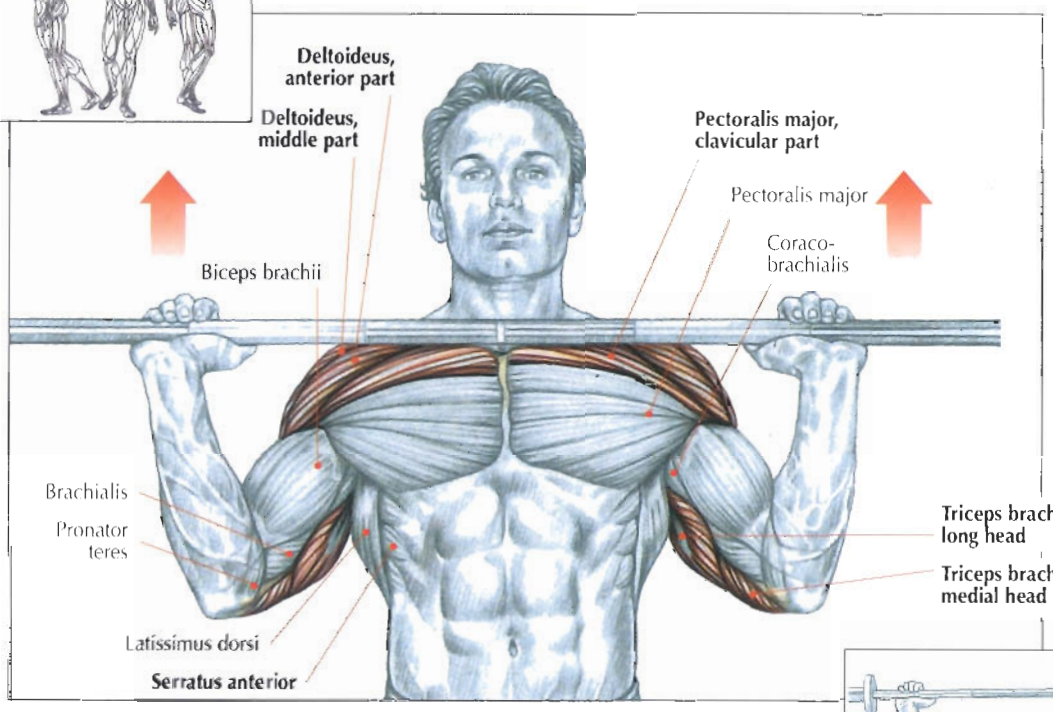


Sit on a bench with your back straight. Grasp a barbell with an overhand grip and rest the barbell across your shoulders behind your neck:
– Inhale and press the barbell directly above your head without arching your back
– Exhale as you complete the movement

This exercise works the deltoids, particularly the medial part, and the upper trapezius, triceps, and serratus anterior. It also works the rhomboids, 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 rotator cuff muscles and should be performed with caution.

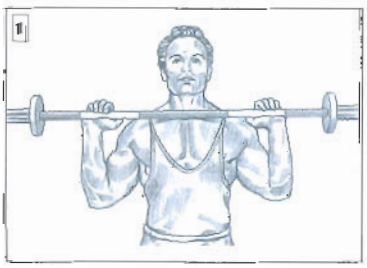
FRONT PRESS 2

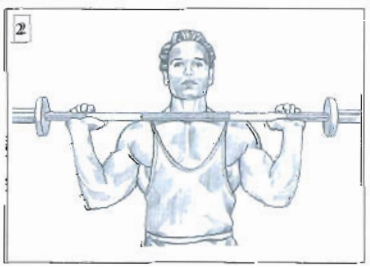


Sit with your back straight. Take an overhand grip on the barbell and rest it on your upper chest:
- Inhale and press the barbell straight up
- Exhale at the top of the movement

This basic exercise works the following muscles:
- Anterior and medial deltoids
- Upper pectorals
- Upper trapezius
- Triceps
- Serratus anterior

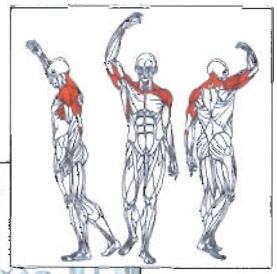
You can perform this exercise while standing, but you must avoid hyperextension of the spine. Place your elbows slighty forward for more work on the anterior deltoids. To involve the medial deltoids more intensely, flare out your elbows. Many machines and racks allow you to perform this movement with less concentration on the correct position, which helps you focus on the deltoids.

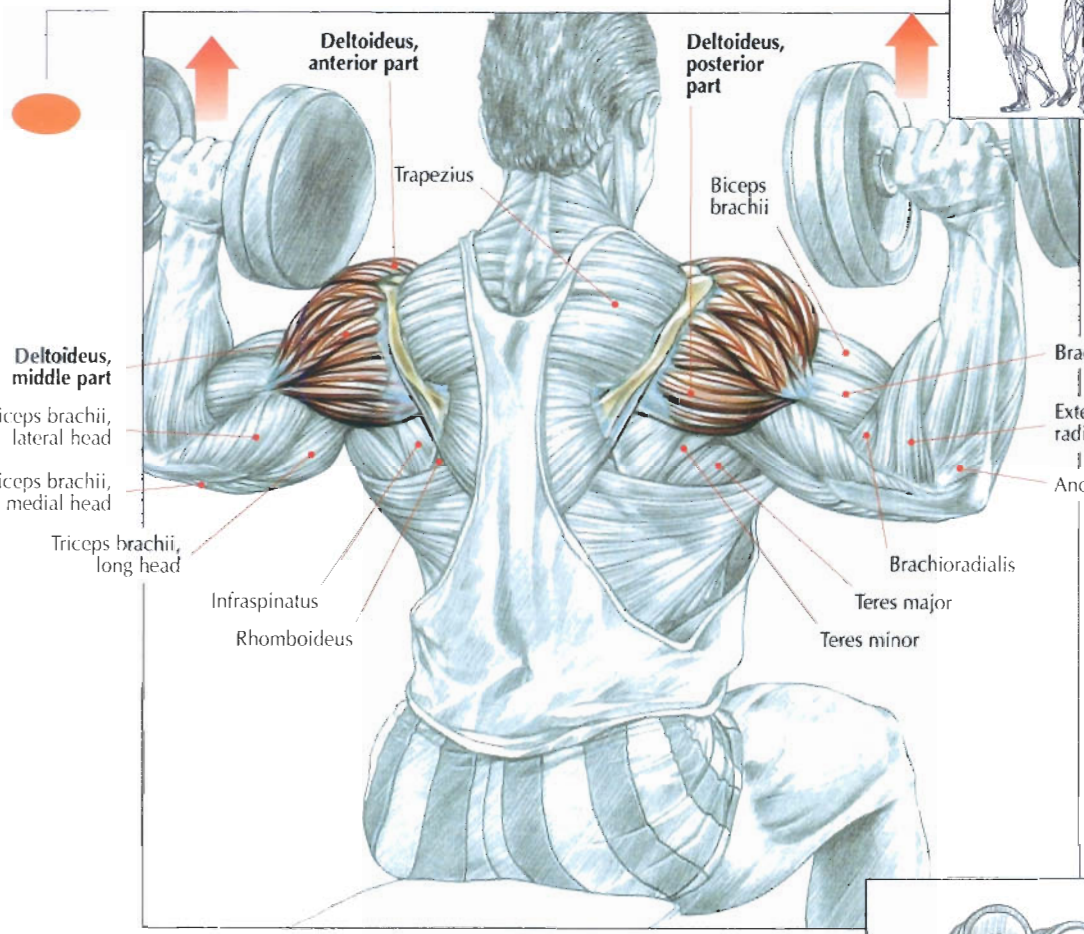




VARIATIONS:
1. Narrow grip, elbows forward: primarily works the ante deltoids and upper pectorals.
2. Wide grip, elbows flared out: Primarily works the ant medial deltoids.

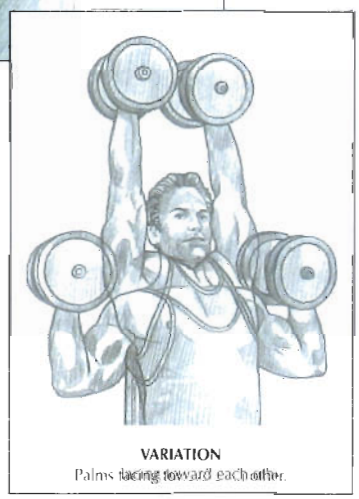
3 DUMBBELL PRESS





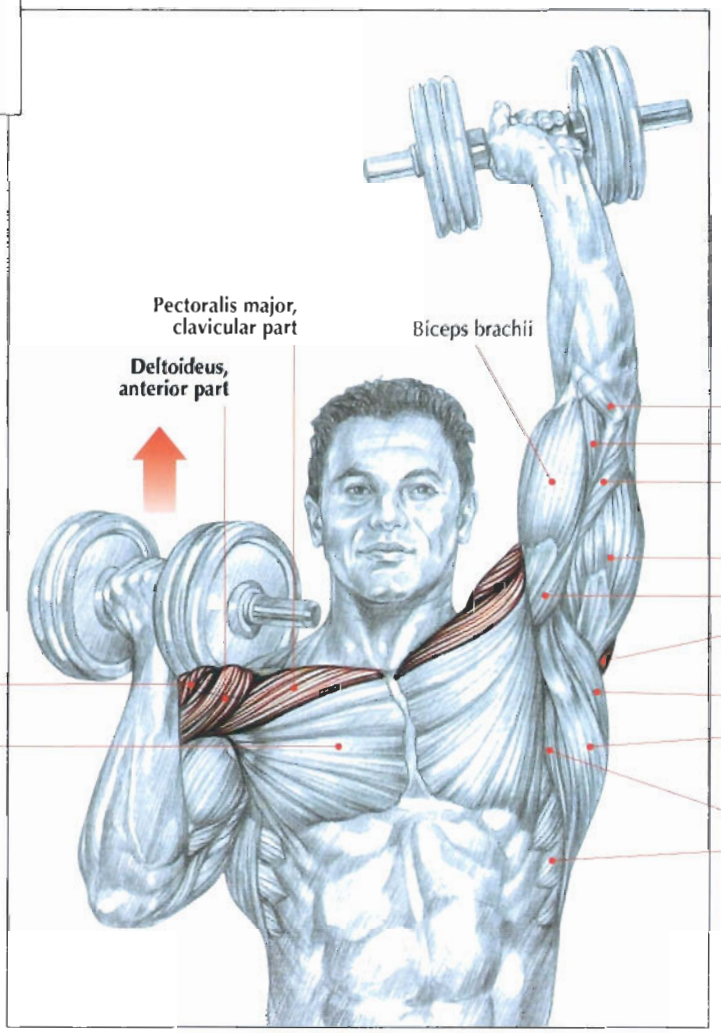
Sit on a bench with your back straight. Grasp two dumbbells with an overhand grip and lift them to your shoulders, palms facing forward:
- Inhale and press your arms to an extended vertical position
- Exhale as you complete the movement

This exercise uses the deltoids, particularly the medial deltoids, 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.



VARIATION
Palms facing toward each other.

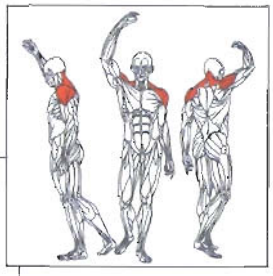
ONE-ARM DUMBBELL PRESS 4

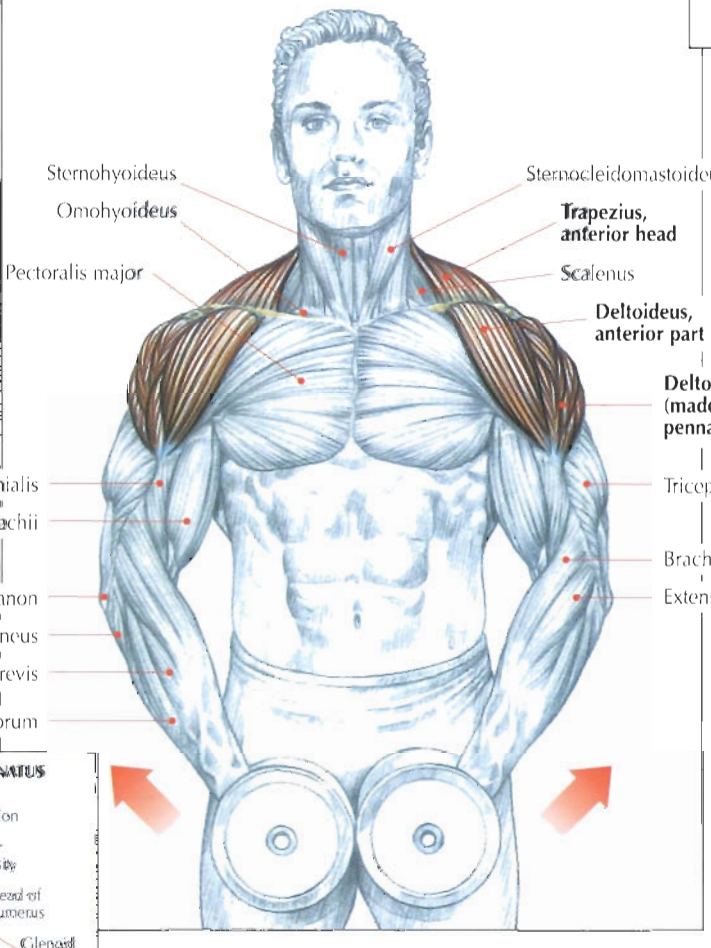


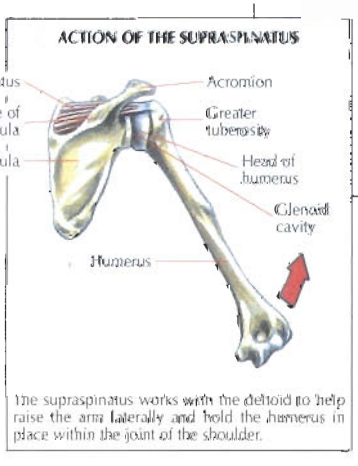
Sit on a bench, grasp the dumbbells with an underhand grip, and lift them to your shoulders:
– Inhale and alternately press your arms to an extended vertical position, rotating your wrist so your palm faces forward
– exhale as you complete the movement

This exercise focuses on the deltoids, particularly the anterior deltoids, and the upper pectorals, upper trapezius, 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
– pressing the dumbbells simultaneously.

5 LATERAL RAISES



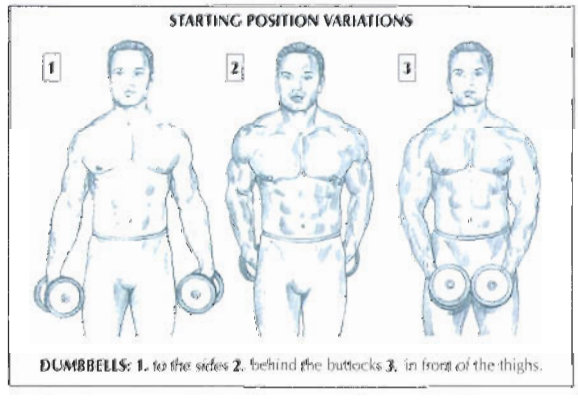




Stand with your feet slightly spread. Keep your back straight, your arms hanging at your sides, holding one dumbbell in each hand:

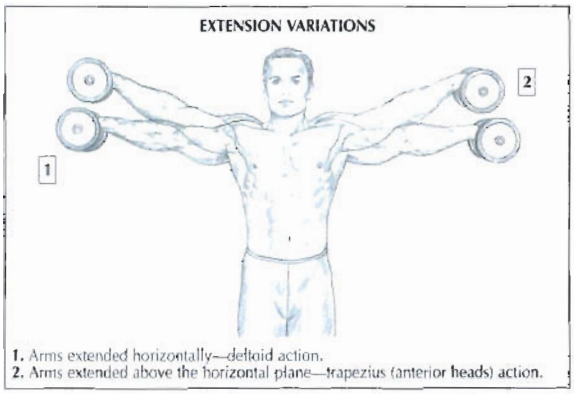
– Raise the dumbbells to shoulder level, keeping your elbows slightly bent

– Return to the starting position



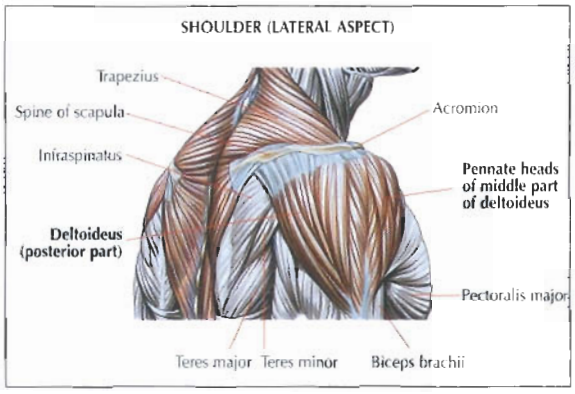
DUMBBELLS: 1. to the sides 2. behind the buttocks 3. in front of the thighs.

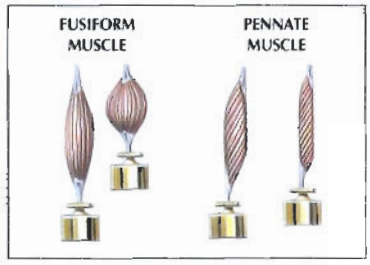
This exercise isolates, almost exclusively, the medial deltoids, which are composed of several pennate heads converging on the humerus. They are involved when you hold relatively heavy weight and enable you to move your arms with precision in every plane. It is more effective to train this muscle by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



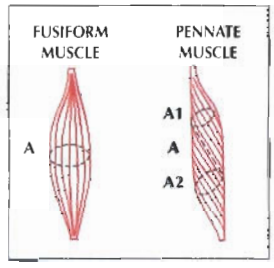
1. Arms extended horizontally—deltoid action.
2. Arms extended above the horizontal plane—trapezius (anterior heads) action.

This exercise also works the supraspinatus, located beneath the deltoid muscle in the supraspinatus fossa of the scapula and inserted into the humeral large tuberosity.
Because body types vary, you must find an optimal angle of work that meets the needs of your physique.
You can stress the upper part of the trapezius by raising the arms above the horizontal plane. However, many bodybuilders avoid doing this to place primary emphasis on the medial deltoid.
This exercise is never performed with heavy weight. Sets of 10 to 25 reps give the best results if you vary the angle of work, spend little time recovering, and train to the point of feeling the burning sensation.





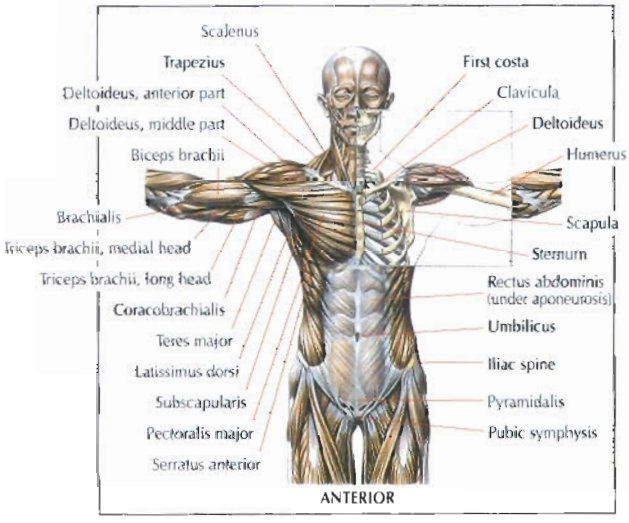
A pennate muscle proportionately moves heavier loads than a fusiform muscle, but for shorter distances. When performing lateral raises, the pennate heads of the medial deltoid—very powerful, but with a weak contraction potential—work synergistically with the anterior and posterior heads of the deltoid to bring the arm horizontal.

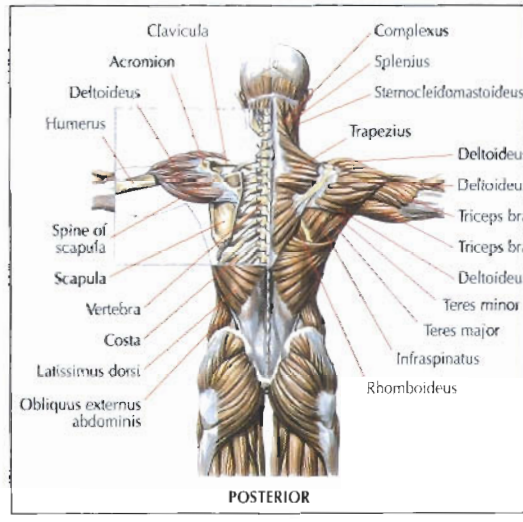


The amount of actin* and myosin* filaments of a fusiform muscle is equal to its crosssection (A).

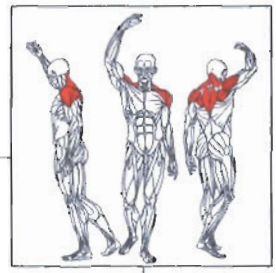
The amount of actin and myosin filaments of a pennate muscle equals the (A) amount of the A1 and A2 oblique sections.

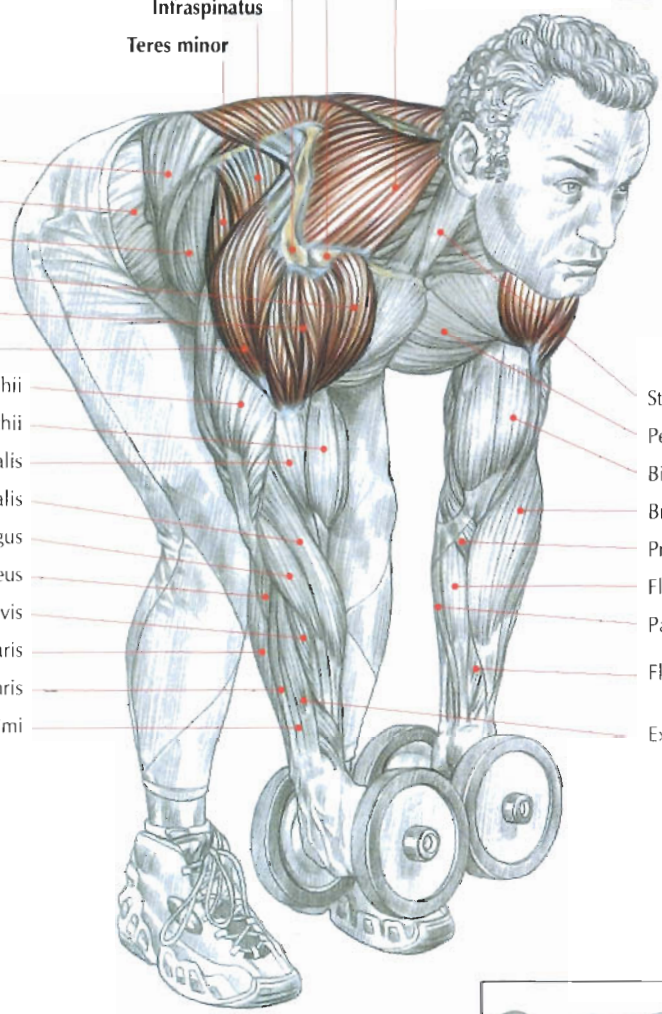
*Muscle motor elements whose maximal contraction force is equal to about 5 kg/cm² of section.

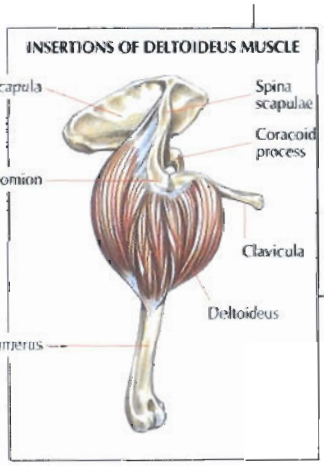




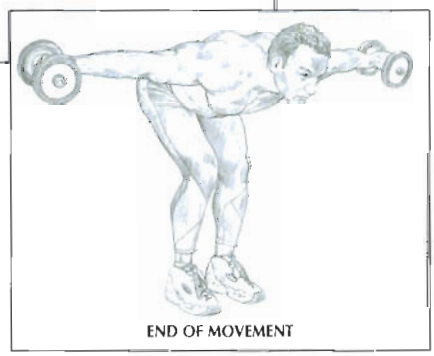
6 BENT-OVER LATERAL RAISES





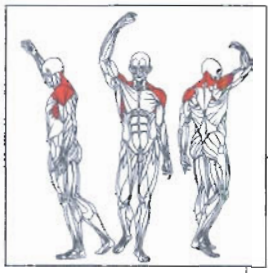


Stand with your feet spread apart and your knees slightly bent. Bend forward at the waist and keep your back straight. Hold the dumbbells with your elbows slightly bent:
– Inhale and raise the dumbbells to your sides
– Exhale as you complete the movement

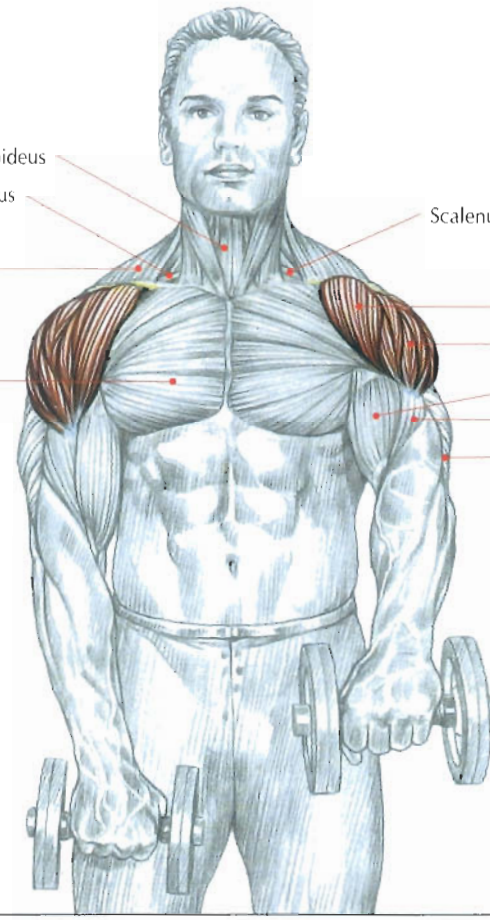


This exercise works the entire shoulder area, particularly the posterior deltoids. Pinch your scapulae (shoulder blades) together at the end of the movement to involve the middle and lower parts of the trapezius, the rhomboids, teres minor, and infraspinatus.

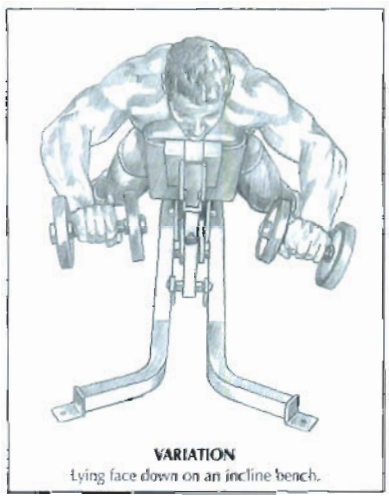
Variation: you can do this movement lying face down on an incline bench.



FRONT RAISES 7



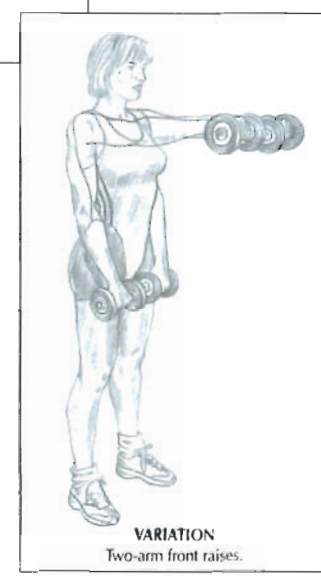
ACTION



VARIATION
Lying face down on an incline bench.

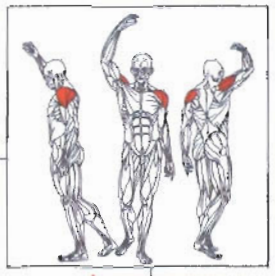
Stand with your feet slightly apart. Hold the dumbbells with your palms down (overhand grip), resting the dumbbells on your thighs or slightly to your sides:
– Inhale and alternate sides, raising the dumbbells forward to shoulder height
– Exhale as you complete the movement

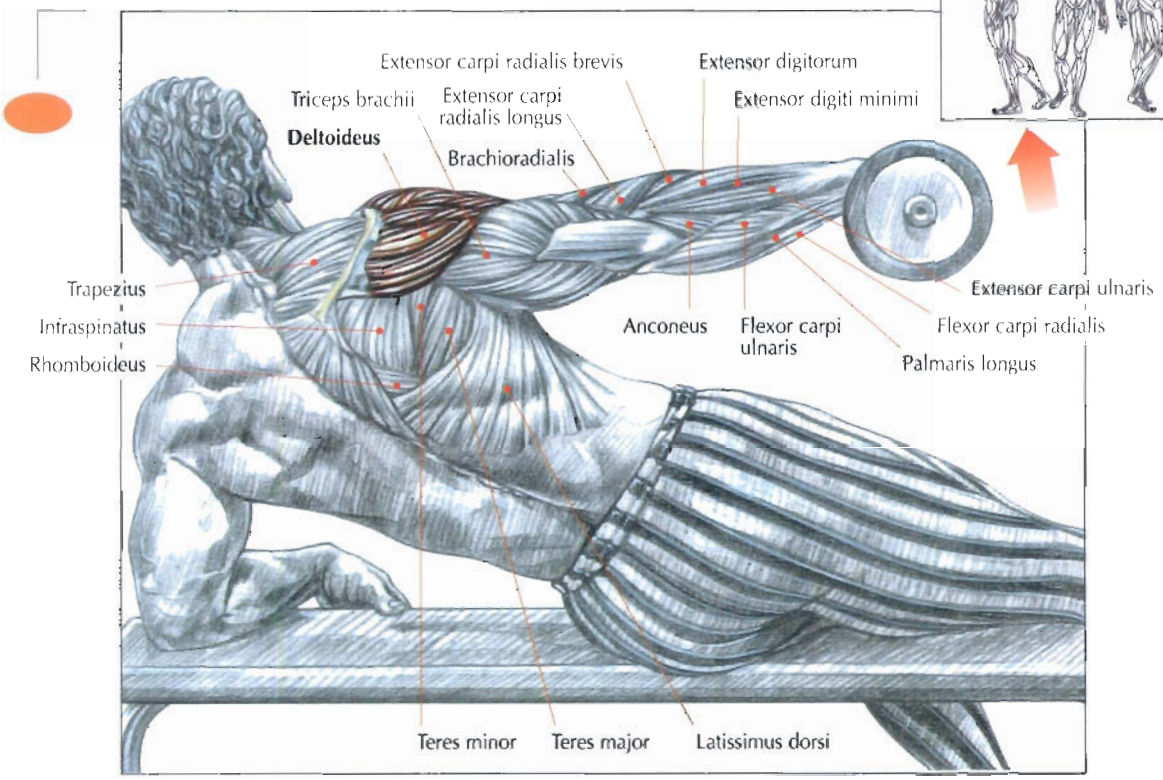
This exercise places primary emphasis on the anterior deltoids and upper pectorals and, to a lesser extent, on the middle deltoids. Every arm raise exercise also involves the muscles that attach the scapulae (shoulder blades) to the rib cage, such as the serratus anterior and rhomboids (which stabilize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



VARIATION
Two-arm front raises.

8 SIDE-LYING LATERAL RAISES

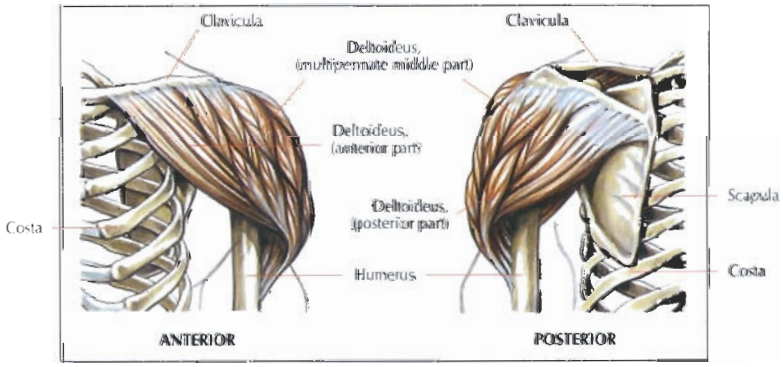


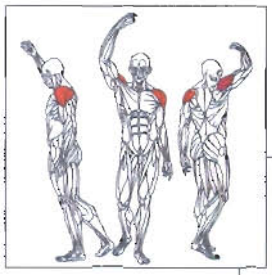


Lie on your side on the floor or a bench, holding a dumbbell with an overhand grip:
– Inhale and raise your arm
– Exhale as you complete the movement

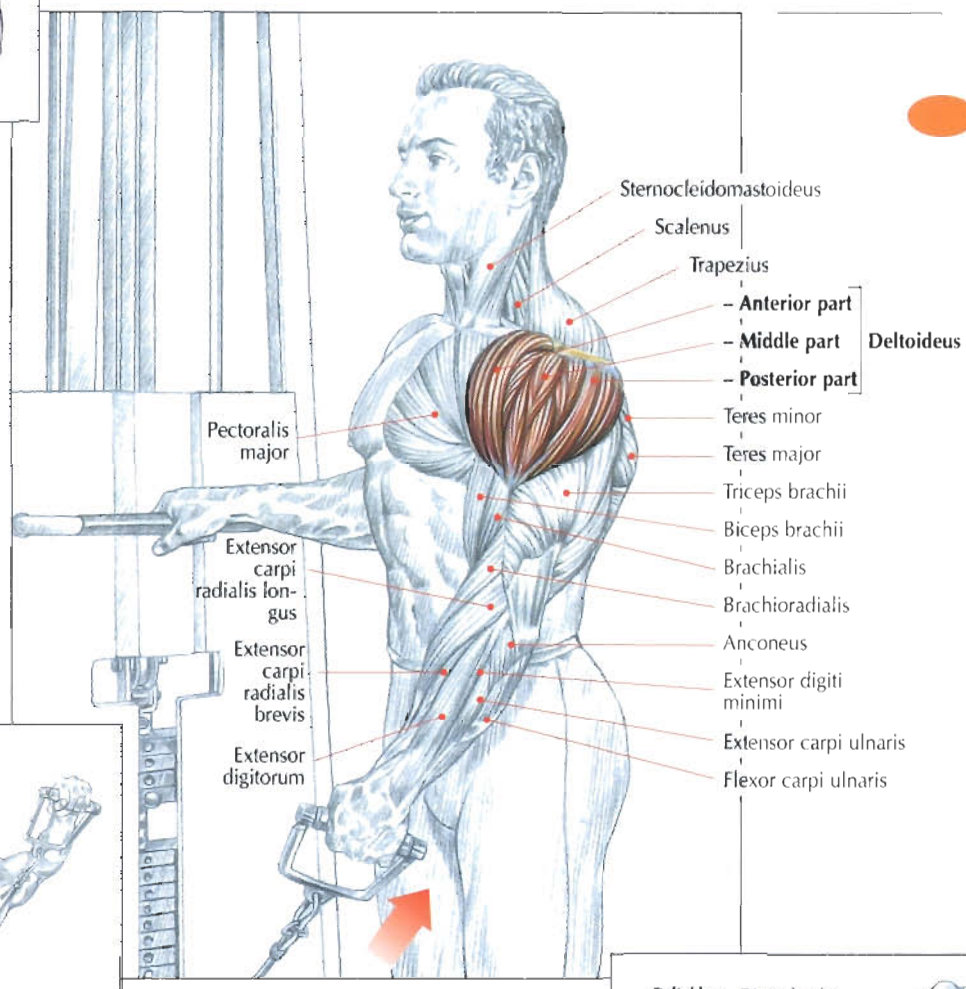
Unlike standing raises, which gradually work the muscle to maximum intensity at the end of the movement (when you bring your arms to a horizontal position), this exercise involves the deltoids differently, concentrating the effort at the beginning of the movement.

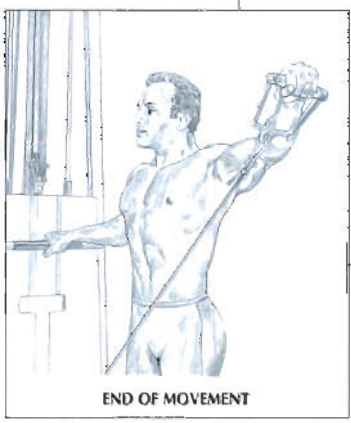
Note: this movement emphasizes the supraspinatus, mainly working at the beginning of the movement. Vary the starting position (dumbbell placed forward, on the thigh, or toward the rear) to place the emphasis on all of the deltoid heads.



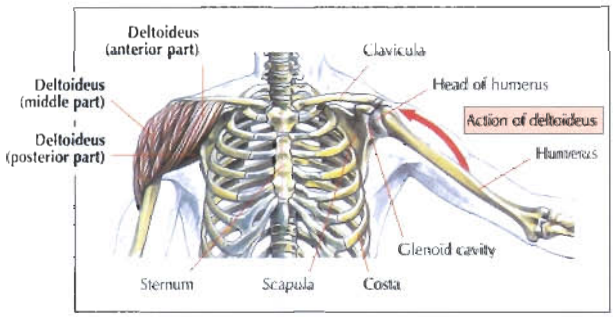


LOW PULLEY LATERAL RAISES 9

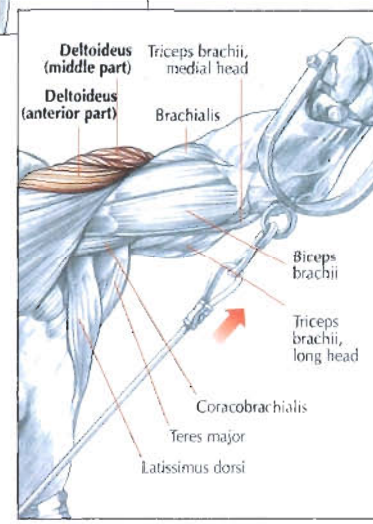




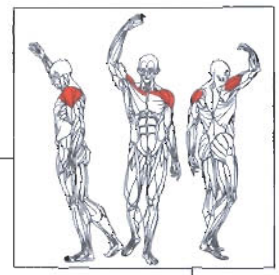
Grasp the handle with your arm at your side:
– Inhale and raise your arm to shoulder height
– Exhale as you complete the movement

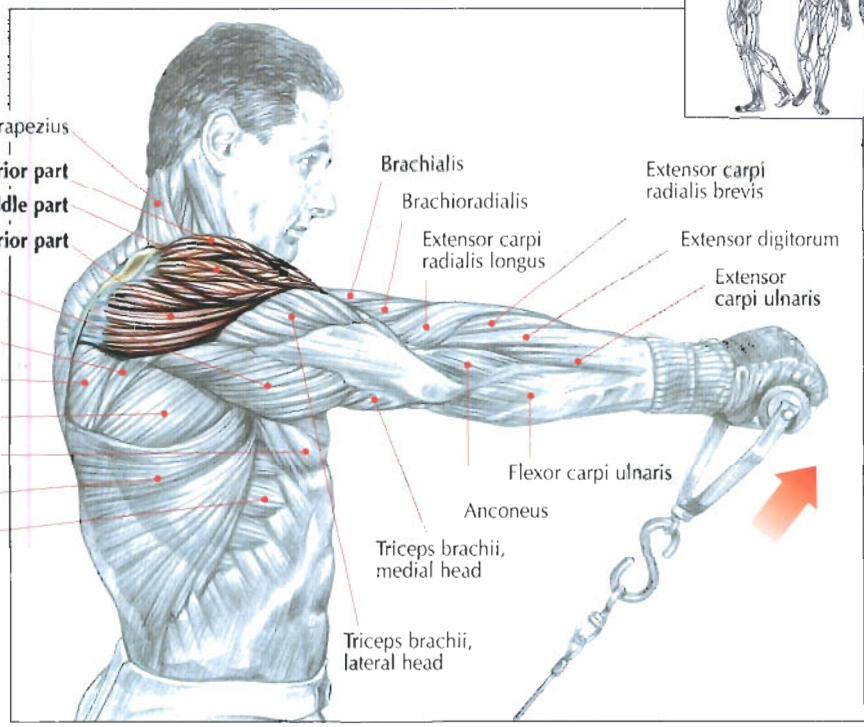


This exercise develops the deltoid, particularly the multipenniform medial head. You should vary the angle of work to stress all the deltoid parts.



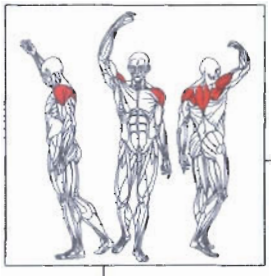
10 LOW PULLEY FRONT RAISES





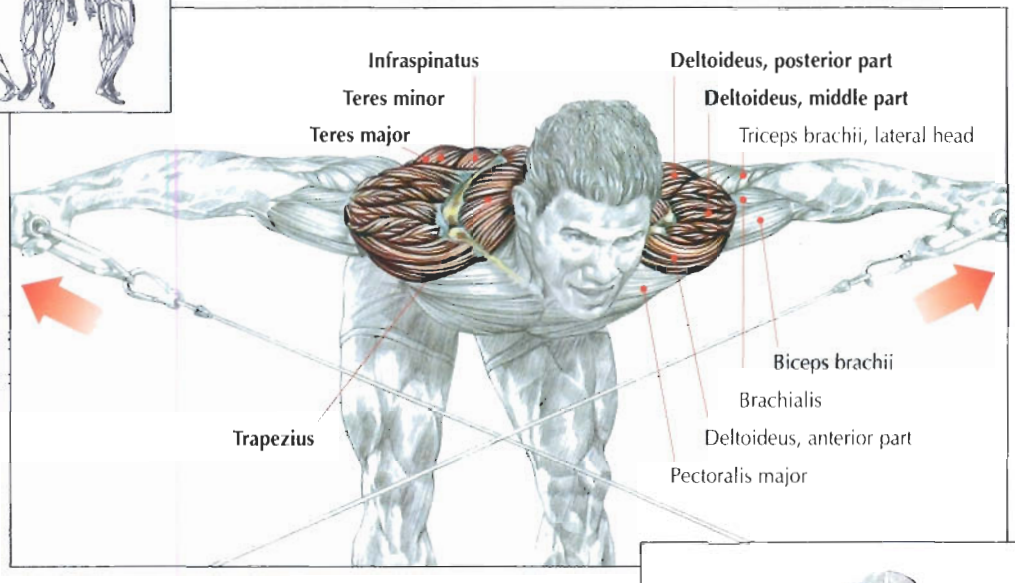
Stand with your feet slightly spread. Hold the handle with an overhand grip, keeping your arms at your sides:
- Inhale and raise your arm forward to shoulder height
- Exhale as you complete the movement

This exercise works the deltoids (particularly the anterior deltoids) as well as the upper pectorals and, to a lesser extent, the short head of the biceps.



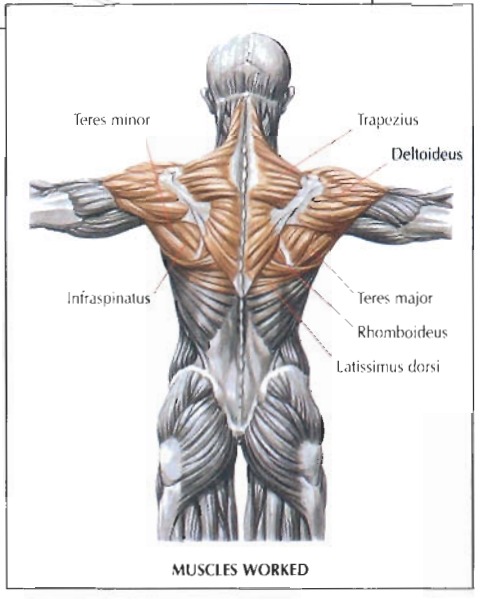
LOW PULLEY BENT-OVER LATERAL RAISES

11



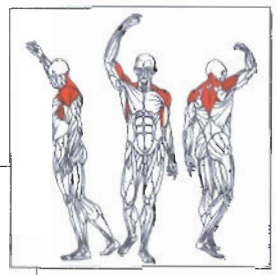
Stand with your feet spread and your knees slighlty bent. Bend forward at the waist, keeping your back straight and your arms hanging down. Hold a handle in each hand with the cables crossing each other:
– Inhale and raise your arms to the sides until your hands are slightly above the level of your shoulders
– Exhale as you complete the movement

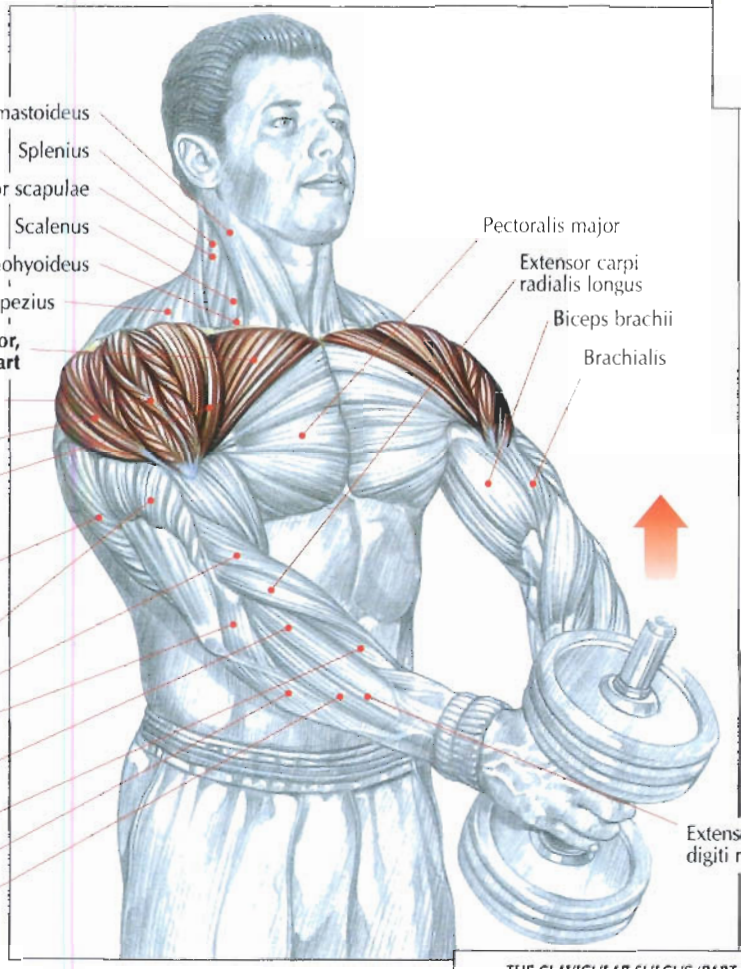
This exercise works the deltoids, especially the posterior deltoids. At the end of the movement, when you pinch your scapulae together, you emphasize the trapezius (medial and inferior portions) and the rhomboids.



MUSCLES WORKED

12 ONE-DUMBBELL FRONT RAISES

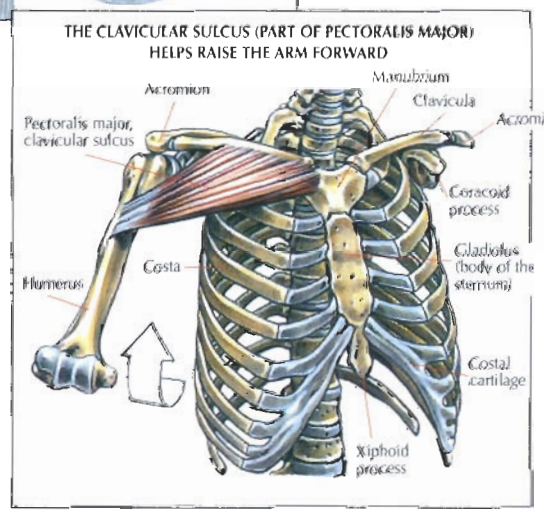




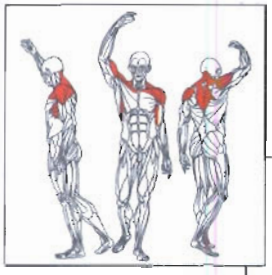
Stand with your feet slightly spread. Keep your back straight and your abdominals contracted. Hold the dumbbell, palms facing in, with your hands overlapping each other. Rest the dumbbell on your thighs with your arms straight:

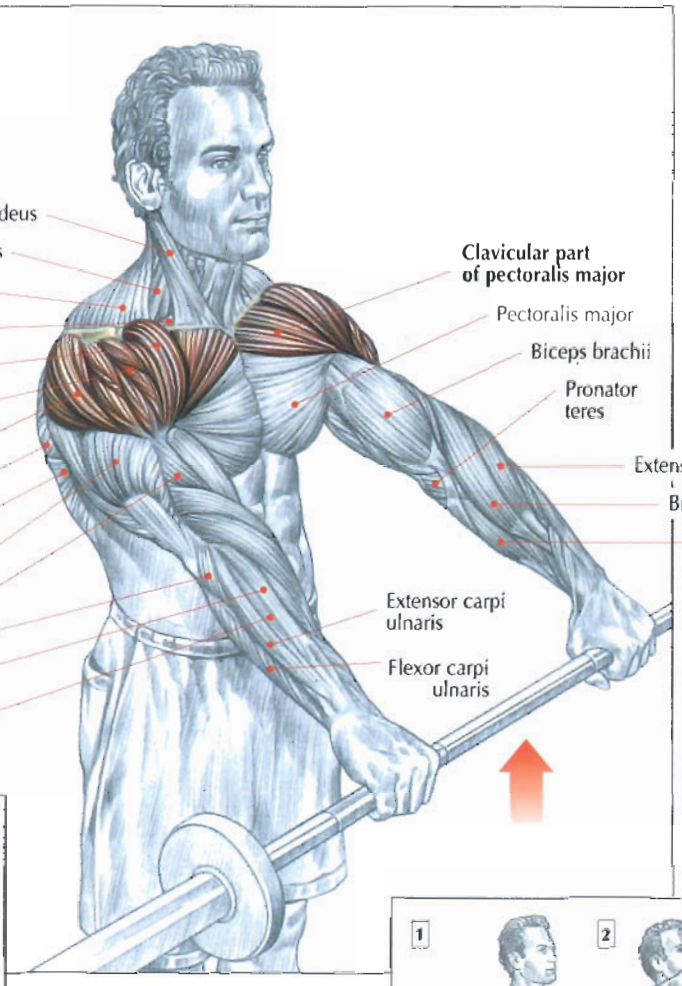
- Inhale and raise the dumbbell forward until it reaches shoulder level
- Slowly lower the dumbbell, making sure to avoid any jerky movements
- Exhale as you complete the movement

This exercise works the anterior deltoids as well as the upper pectorals and the short head of the biceps.
All the muscles that stabilize the scapulae use isometric action, allowing the humerus to pivot on a stable support.



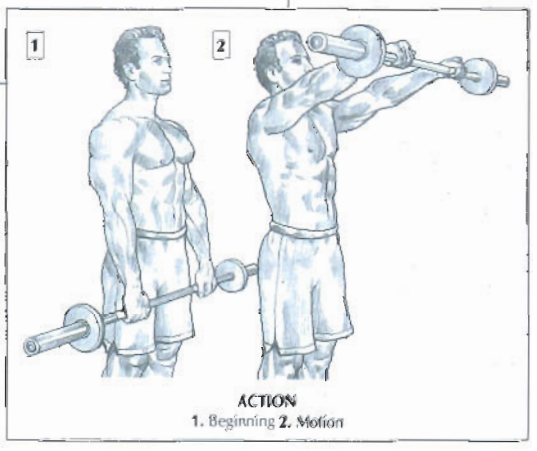
BARBELL FRONT RAISES 13





VARIATION
Low pulley 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

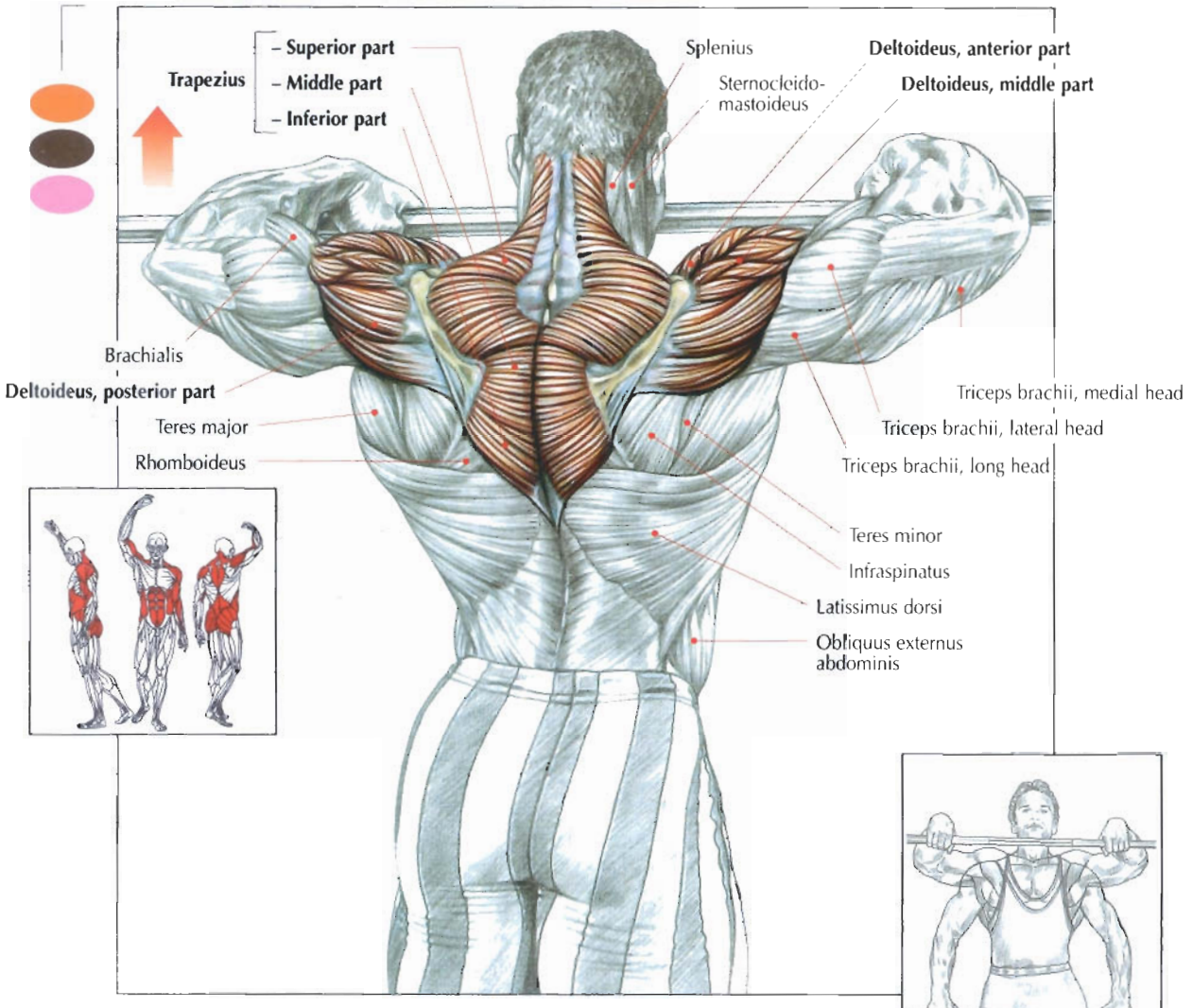


ACTION
1. Beginning **2.** Motion

This exercise works the anterior deltoids, upper pectorals, infra-spinatus and, to a lesser extent, the trapezius, serratus anterior, and short head of the biceps. If you raise the barbell higher, you also stress the posterior deltoids. Doing so intensifies the work of the other muscles. The same exercise can be performed with a low pulley machine while facing away from the machine with the cable running between your legs.

Note: every front raise arm exercise places secondary emphasis on the biceps.

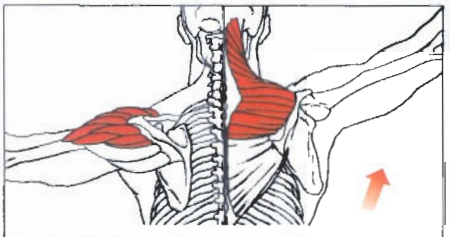
14 UPRIGHT ROWS



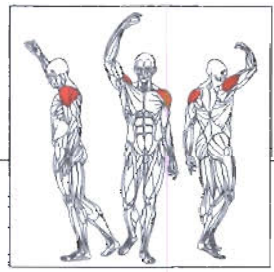
Stand with your feet slighlty spread. Keep your back straight. Take an overhand grip on the barbell with your hands slightly more than shoulder-width apart and resting on your thighs:

– Inhale and pull the barbell upward close to your body until it reaches your chin, raising your elbows as high as possible
– Slowly return to the arms-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 forearm, sacrospinalis, and abdominal muscles.



Once the deltoid moves the arm upward in a horizontal position, the trapezius takes over to move the scapula, allowing you to raise your arm higher.

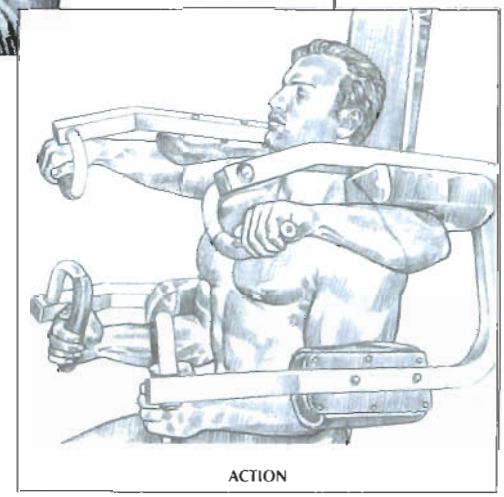


NAUTILUS LATERAL RAISES 15

Sternohyoideus
Pectoralis major, clavicular part
Pectoralis major
Clavicula
Sternum
Deltoideus
Biceps brachii
Triceps brachii
– Long head
– Medial head
Brachialis
Pronator teres
Brachioradialis
Flexor digitorum
Flexor carpi ulnaris
Extensor carpi radialis longus
Palmaris longus
Flexor carpi radialis
Omohyoideus
Sternocleidomastoideus
Levator anguli oris
Scalenus
Trapezius
– Anterior part
– Middle part
Deltoideus
Triceps brachii, lateral head

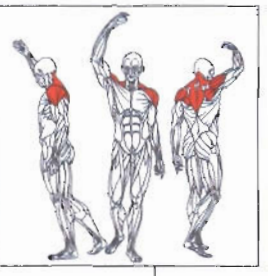
Sit on the machine's seat and grasp the handles:
– Inhale and raise your elbows to shoulder level
– Exhale as you complete the movement

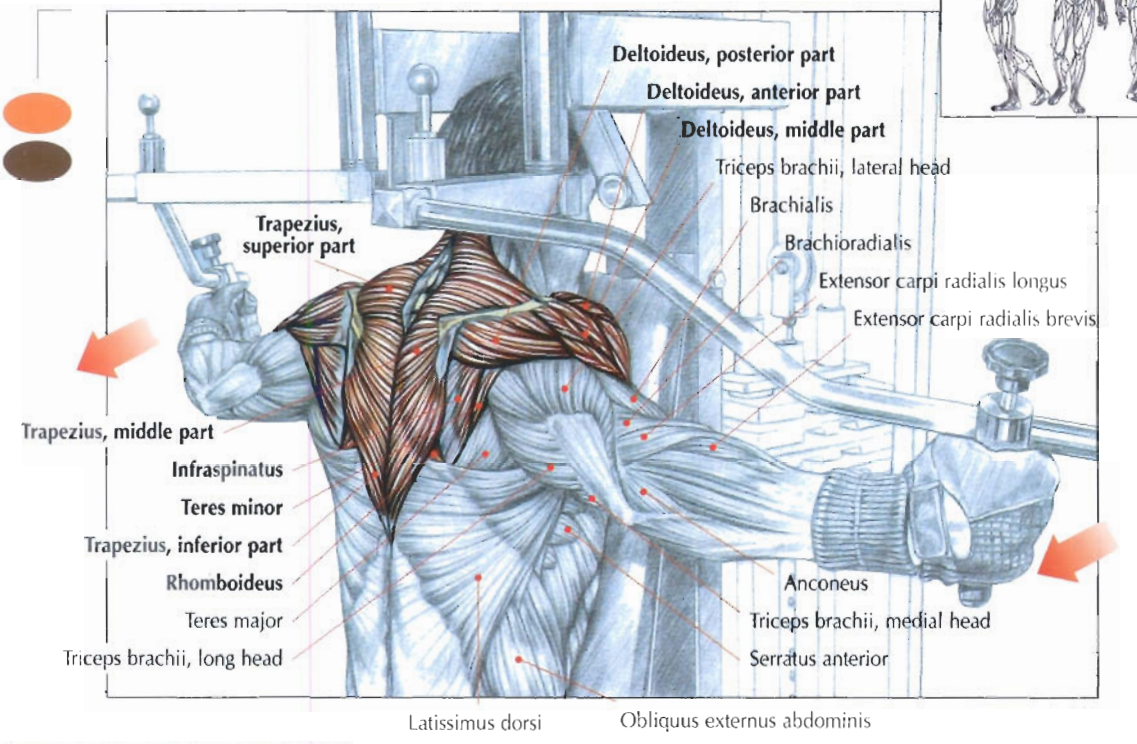
This exercise isolates your medial deltoids. It places secondary emphasis on the supraspinatus (situated deep under the deltoid) and the upper trapezius if you raise your arms above the horizontal plane.
This is an excellent movement for beginners because it requires little effort to correctly position yourself.



ACTION

16 PEC DECK REAR DELT LATERALS





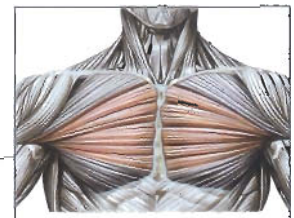
Sit in a pec deck machine facing toward its back support with your arms stretched out grasping the handles:
– Inhale and force your elbows to the rear, pressing your scapulae together at the end of the movement
– Exhale as you complete the movement

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.

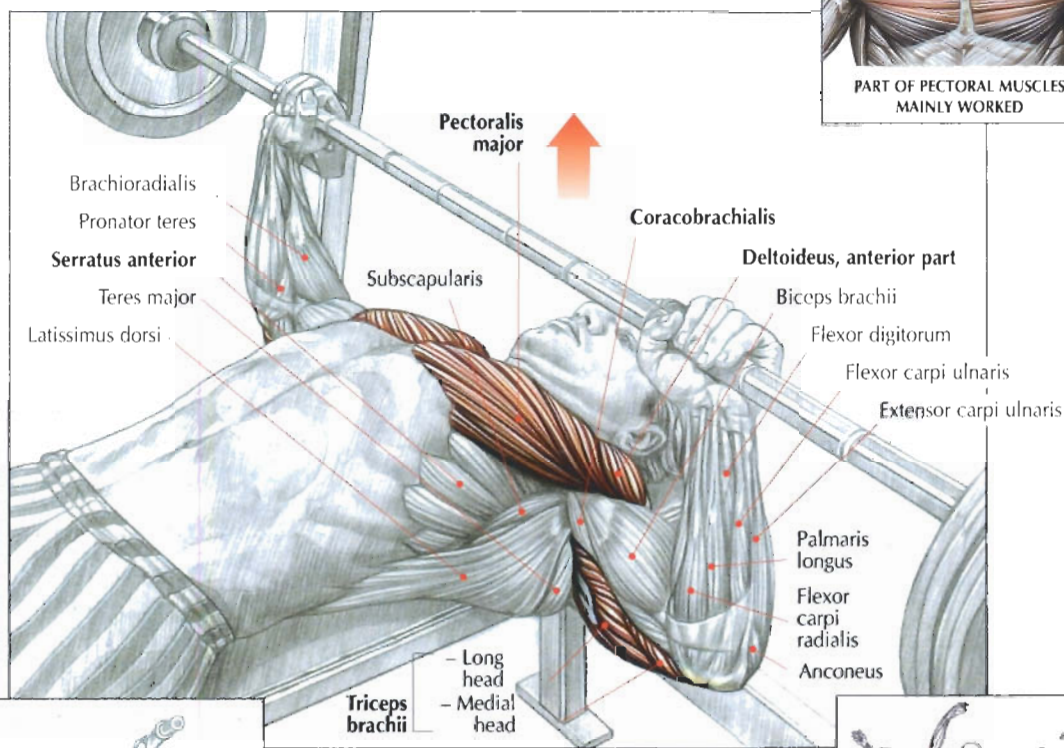
3 CHEST

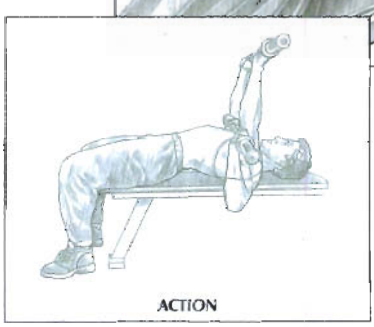
1. Bench Press
2. Close-Grip Bench Press
3. Incline Press
4. Decline Press
5. Push-Ups
6. Parallel Bar Dips
7. Dumbbell Press
8. Dumbbell Flys
9. Incline Dumbbell Press
10. Incline Dumbbell Flys
11. Pec Deck Flys
12. Cable Crossover Flys
13. Dumbbell Pullovers
14. Barbell Pullovers

1 BENCH PRESS

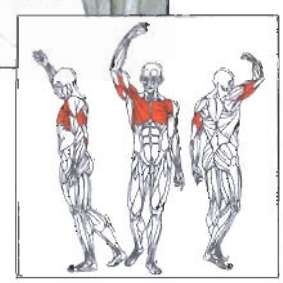


PART OF PECTORAL MUSCLES MAINLY WORKED

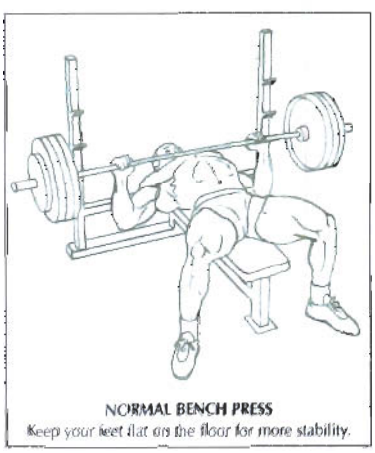




ACTION



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
– Press the weight back up, exhaling as you complete the movement



NORMAL BENCH PRESS
Keep your feet flat on the floor for more stability.

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

Variations :

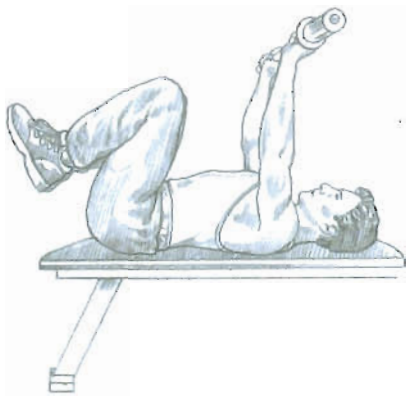
1. Arch your back to work the more powerful lower pectorals and lift heavier loads. However, perform this variation carefully to reduce the likelihood of injury to your back.
2. Press the barbell with your elbows at your sides to focus more on the anterior deltoids.
3. Vary the width of your grip:
–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

VARIATION
ARCHING YOUR BACK

If you arch your back to perform the bench press, you can use much heavier weight because you will place much more stress on the lower pectorals.
At competition level, you must not move your feet and head. In addition, your buttocks should always remain in contact with the bench.

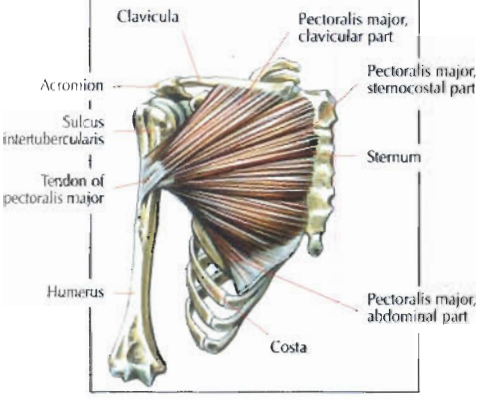
People who have back problems must avoid this variation.

VARIATION
LEGS CURLED UP



Curl your legs over your lower torso to avoid extreme arch and lower back pain. This variation can also be used to decrease the emphasis on the lower pectorals, shifting it to the medial and upper pectorals.

PECTORALIS MAJOR

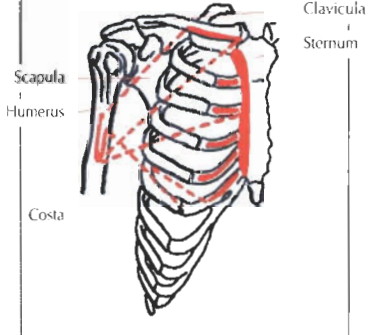


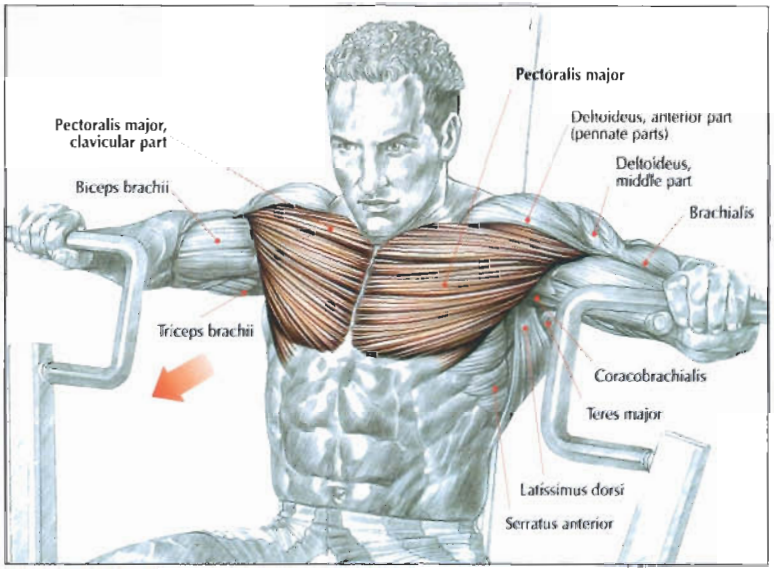
Variation with a machine :

Stand or sit, depending on the machine, and grasp the bar or the handles:
– Inhale and press
– Exhale at the end of the movement

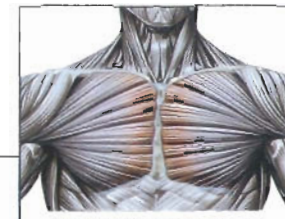
This safe exercise is excellent for beginners. It focuses on the pectorals and keeps your body set in the prescribed movement pattern. Beginners can gain strength this way before trying the free weight bench press.
Depending on the type of machine, this exercise allows advanced bodybuilders to isolate the work on the upper, medial, or lower pectorals, helping them develop muscle balance.

INSERTIONS OF PECTORALIS MAJOR

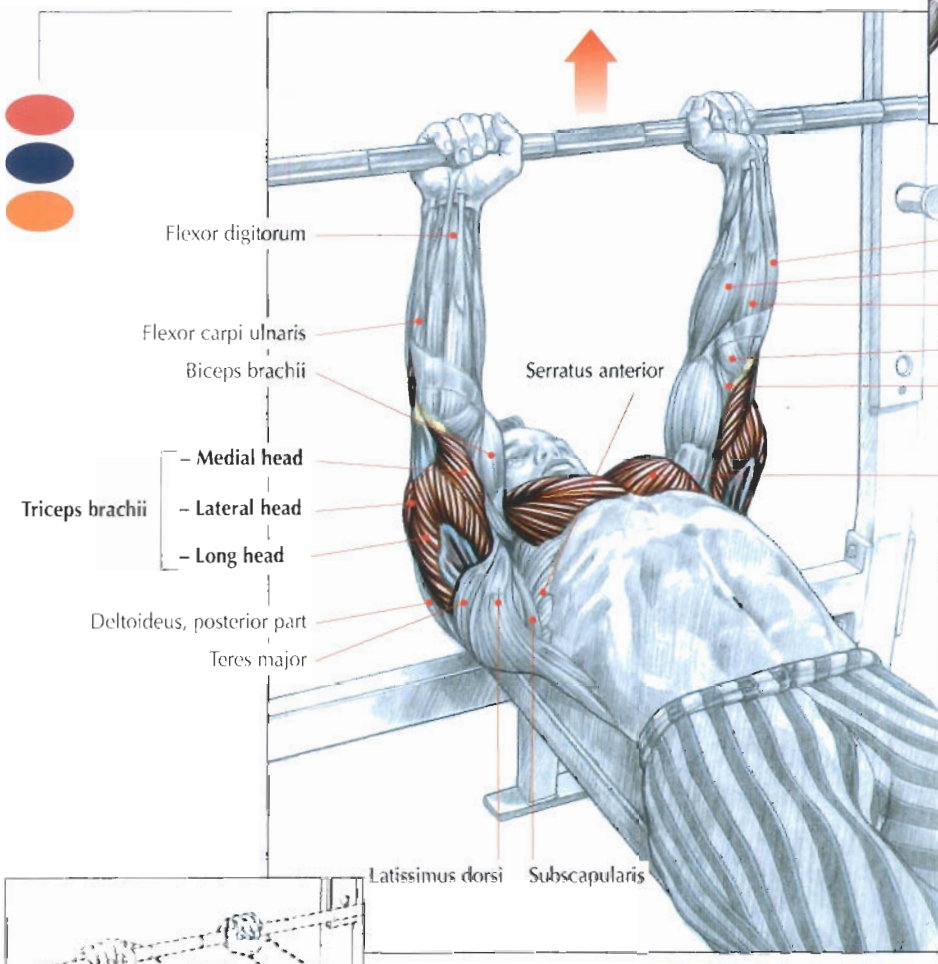


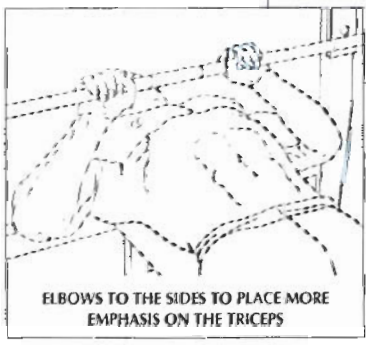


2 CLOSE-GRIP BENCH PRESS



PART OF PECTORAL MUSCLES MAINLY WORKED



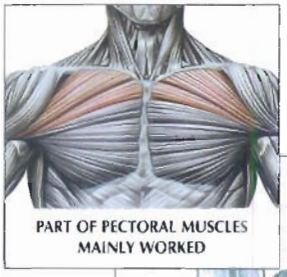


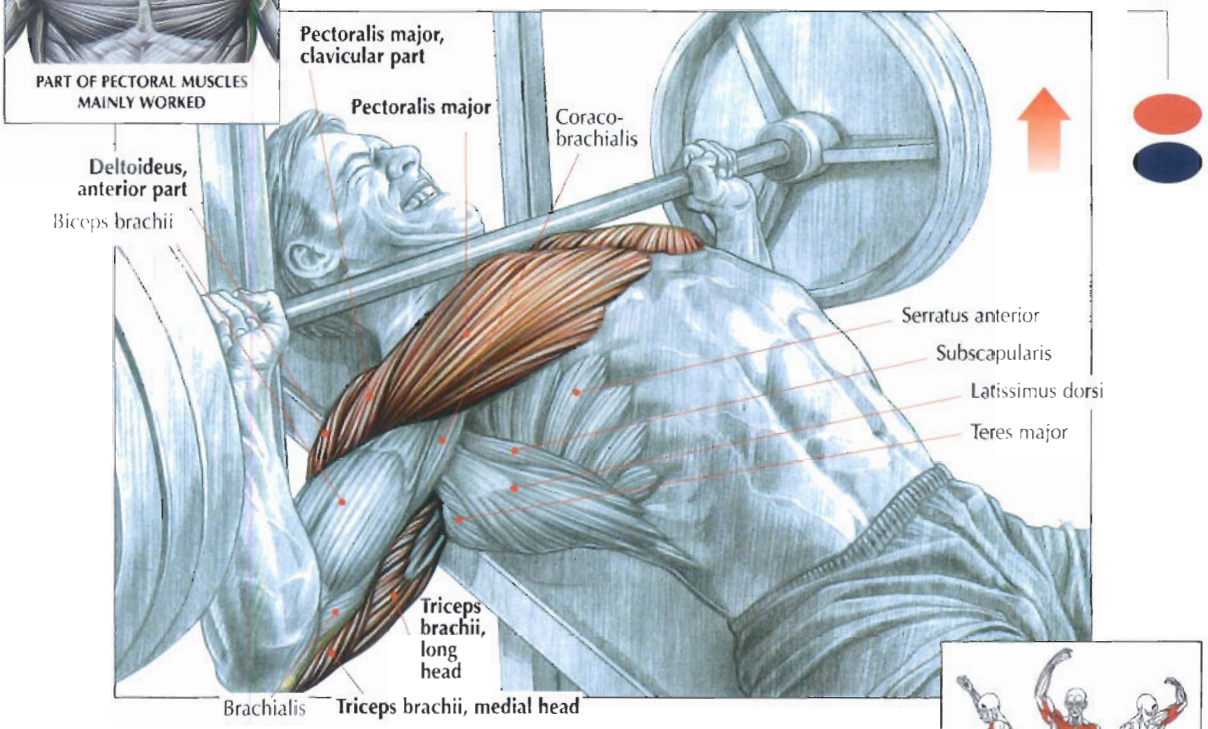
ELBOWS TO THE SIDES TO PLACE MORE EMPHASIS ON THE TRICEPS

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 overhand grip on the barbell with your hands from 4 to 15 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
– Press the barbell upward, exhaling as you complete the movement

This exercise is excellent for developing the pectorals 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 3

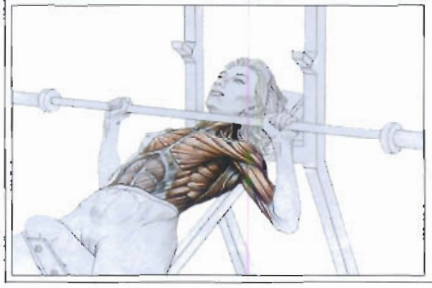


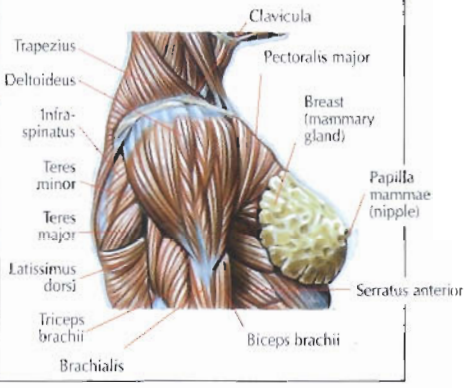


Lie on an incline bench set at an angle ranging between 45 and 60 degrees. Take an overhand grip on the barbell with your hands more than shoulder-width apart:
- Inhale and lower the barbell until it reaches your jugular notch (upper chest at the base of your neck)
- Press the bar back up to straight arms length, exhaling as you complete the movement

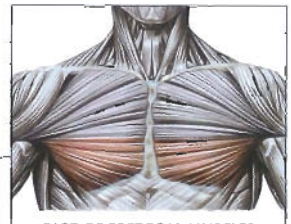
This exercise works the upper pectorals, anterior deltoids, triceps, and serratus anterior.
You can use a weight rack to perform this movement.

Contrary to belief, the incline press does not firm women's breasts, nor does it prevent them from drooping in any way. Breasts are made of fat which holds the mammary glands. The entire structure, held together in a connective tissue framework, rests on the pectoralis major.

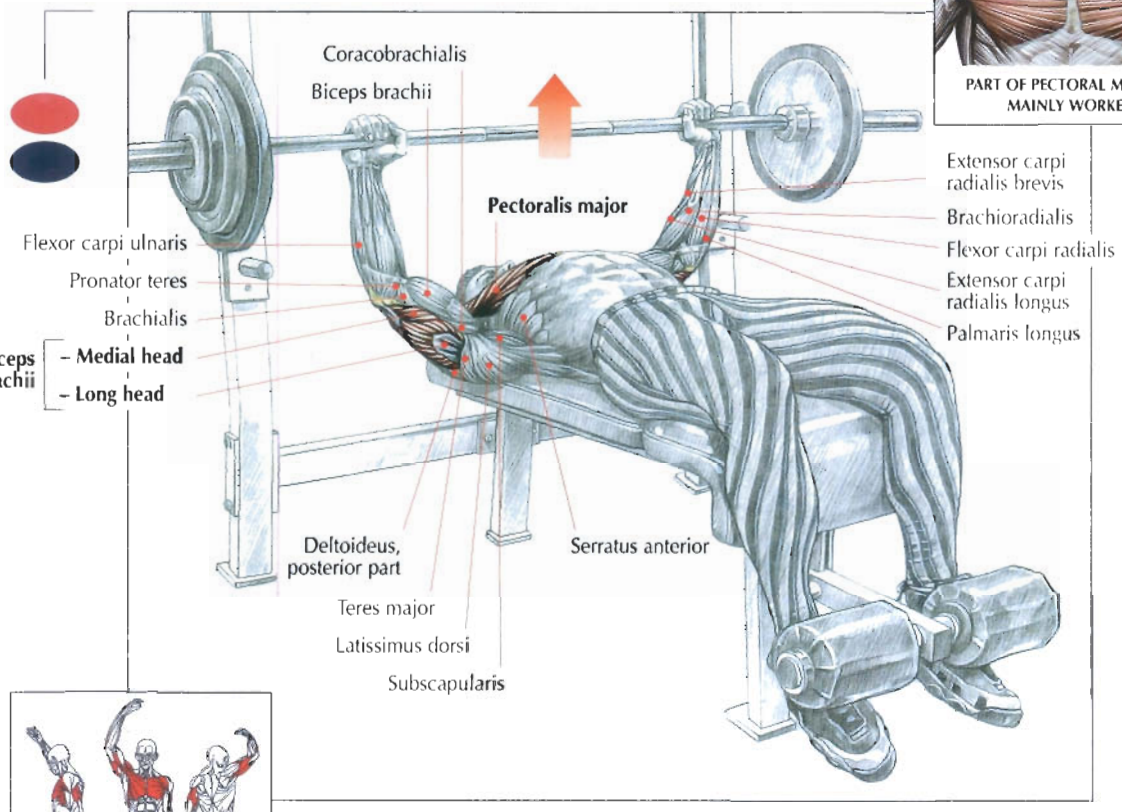




4 DECLINE PRESS



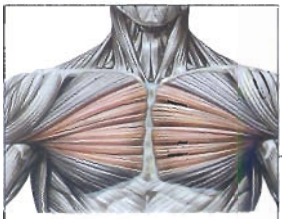
PART OF PECTORAL MUSCLES MAINLY WORKED



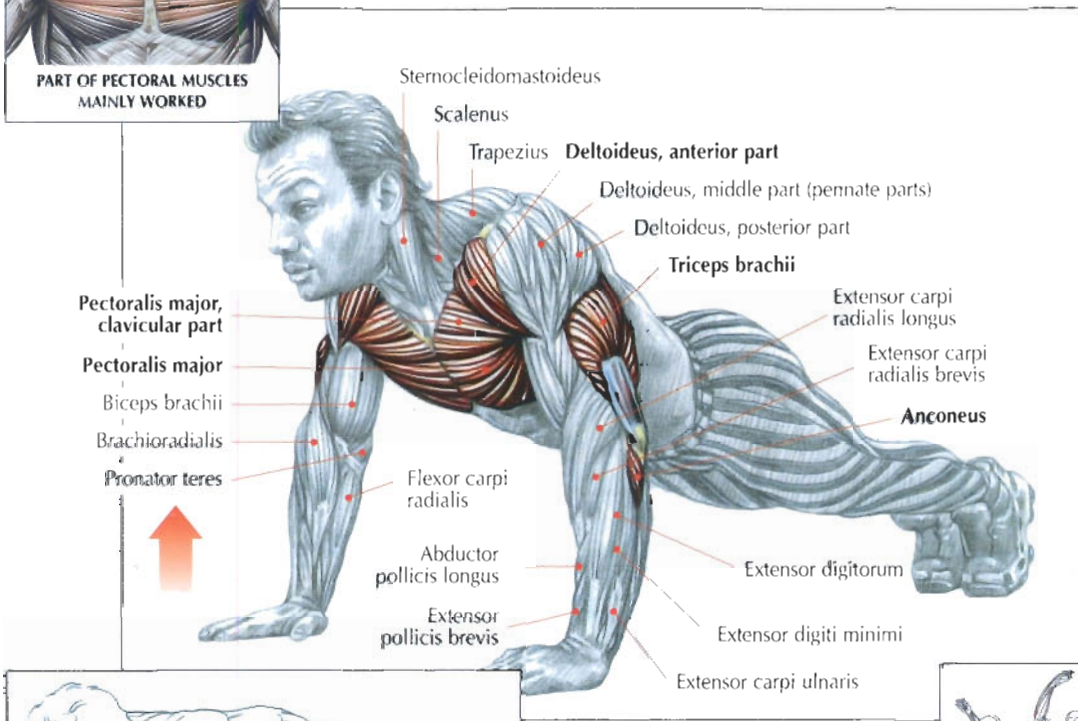
Lie on a decline bench set at an angle between 20 and 40 degrees with your feet anchored to prevent them from slipping. Take an overhand grip on the bar with your hands at least shoulder-width apart:
– Inhale and slowly lower the bar until it reaches the lower edge of your pectorals
– Press the bar back up, exhaling as you complete the movement

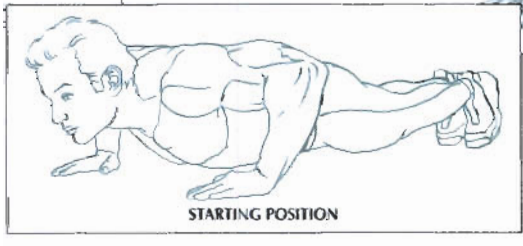
This exercise works the pectoralis major (particularly the lower part), triceps, and anterior deltoids. It places secondary emphasis on the lower fold of the pectorals. In addition, lowering the bar to neck level helps stretch the pectoralis major, increasing its flexibility.
You can also use a Smith-machine.

PUSH-UPS 5



PART OF PECTORAL MUSCLES MAINLY WORKED

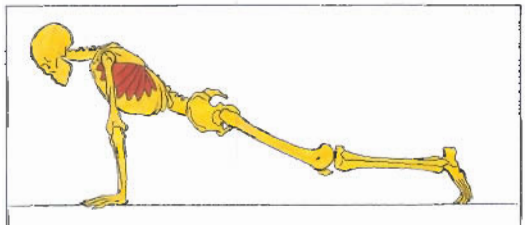




STARTING POSITION

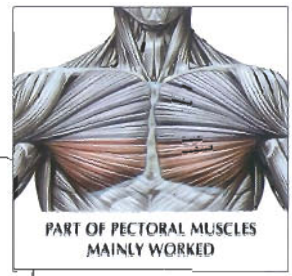
Lie prone with your arms straight, your palms flat on the floor, and your hands shoulder-width apart (or wider). Hold your feet together or very slightly spread:
– Inhale and bend your elbows to bring your torso near the floor, avoiding extreme hyperextension of your spine
– Push yourself back to an arms-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.
Vary the torso angle to isolate the work:
– Elevate the feet to focus on the upper pectorals
– Elevate the torso to focus on the lower pectorals

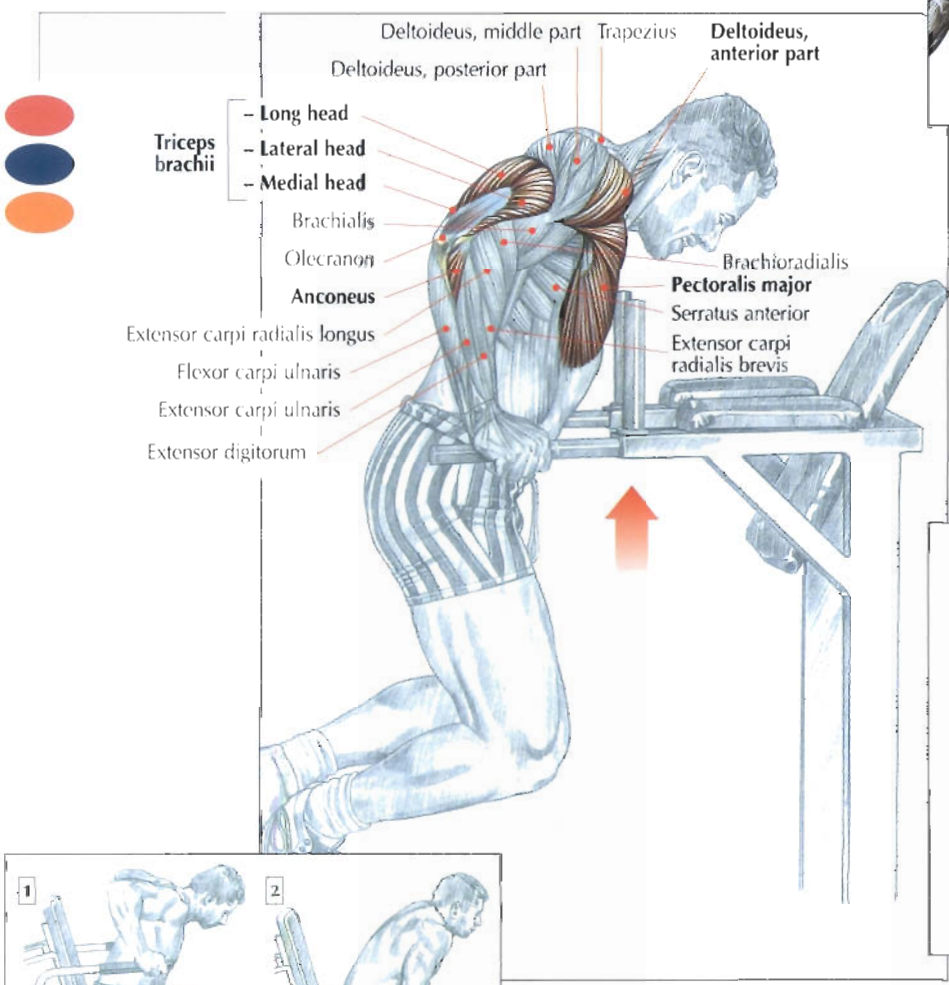


When you do push-ups, the contraction of the serratus anterior holds the scapulae on the rib cage, combining arm and torso action.

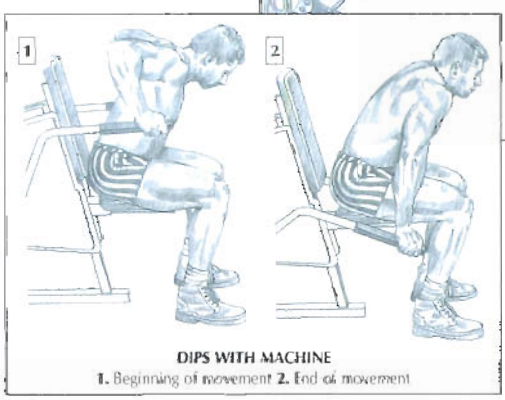
6 PARALLEL BAR DIPS



PART OF PECTORAL MUSCLES MAINLY WORKED



ACTION



DIPS WITH MACHINE
1. Beginning of movement 2. End of movement

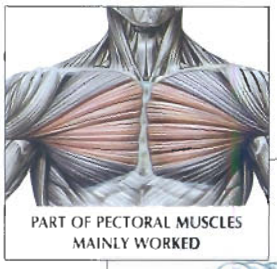
Support yourself with your arms straight and your torso hanging down from your shoulders:
– Inhale and bend your elbows to allow your body to sink as far down between the bars as possible
– Reverse the motion and return to the starting point, exhaling as you complete the movement

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

This exercise is excellent for stretching the pectoralis major and increasing the flexibility of the pectoral girdle. However, it is not recommended to beginners because it requires sufficient strength. To that purpose, use the machine to master the technique.
Sets of 10 to 20 reps give the best results. To gain more power and size, experienced athletes can hang a dumbbell between their legs or place barbell plates around their waist.

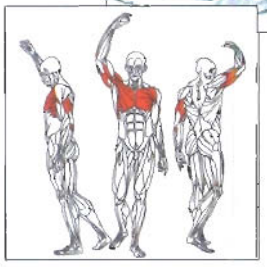
Note: always perform the dips carefully to avoid traumatizing the shoulder joint.

DUMBBELL PRESS 7

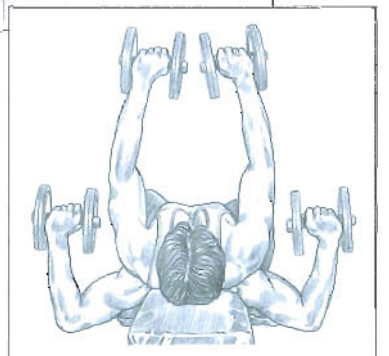


PART OF PECTORAL MUSCLES MAINLY WORKED

Extensor digiti minimi
Extensor digitorum
Deltoideus, anterior part
Pectoralis major
Flexor carpi ulnaris
Extensor carpi radialis brevis
Extensor carpi ulnaris
Extensor carpi radialis longus
Anconeus
Deltoideus, middle part
Trapezius
Biceps brachii
Brachioradialis
Brachialis
Triceps brachii



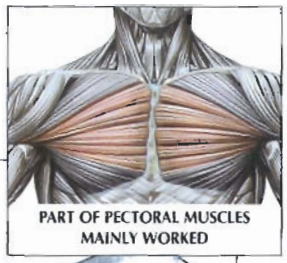
Lie flat on the bench with your feet on the floor for stability, your arms extended upward, and your hands facing in toward each other holding the dumbbells:
– Inhale and lower the dumbbells to chest level, bending your elbows and rotating your forearms to bring your hands in pronation
– Press the dumbbells back up and do an isometric contraction to isolate the stress on the upper pectorals; exhale as you complete the movement

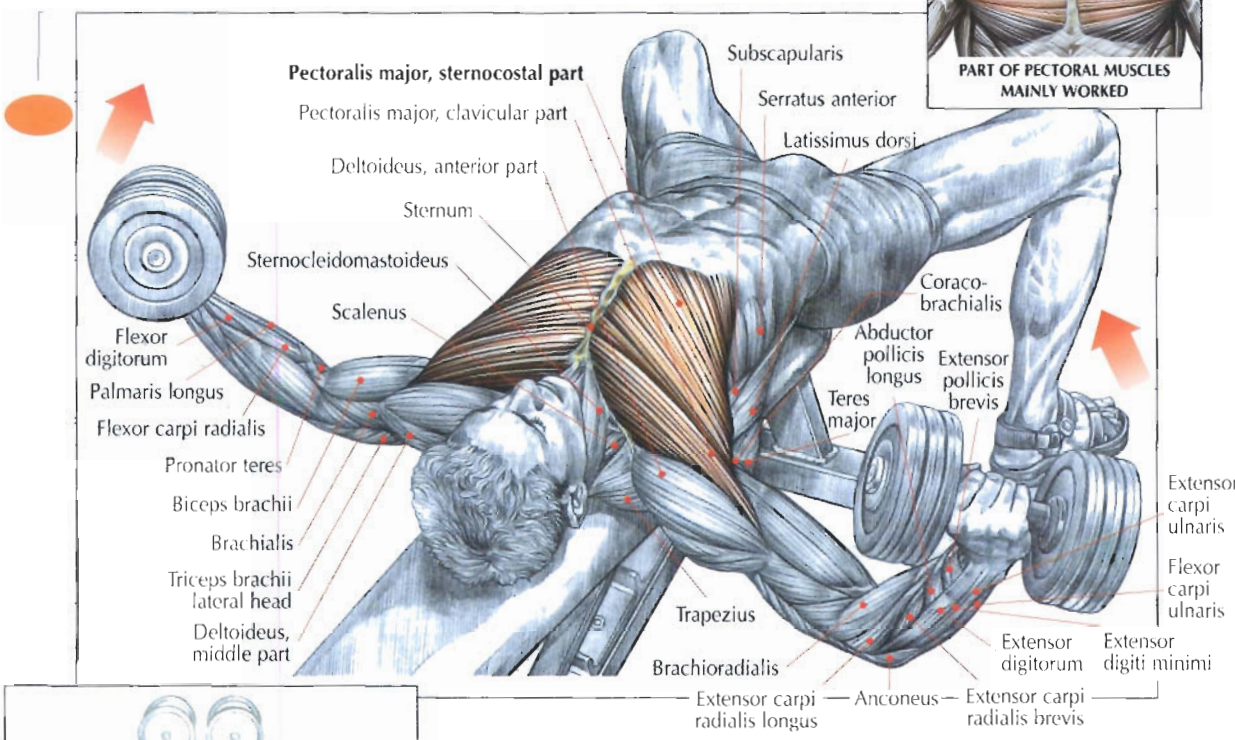


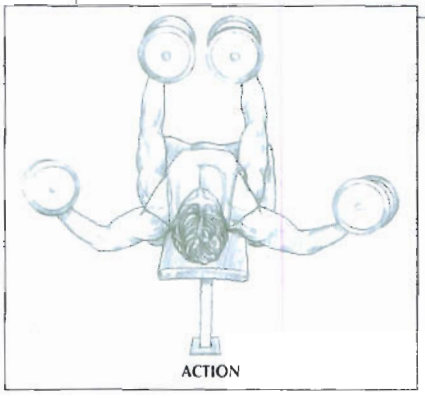
ACTION

This exercise is similar to the barbell 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.

8 DUMBBELL FLYS





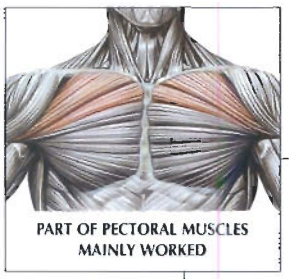


Lie flat on a narrow bench to allow free movement of your shoulders. Hold the dumbbells with your arms extended and your elbows slightly bent to lessen the stress on the joint:

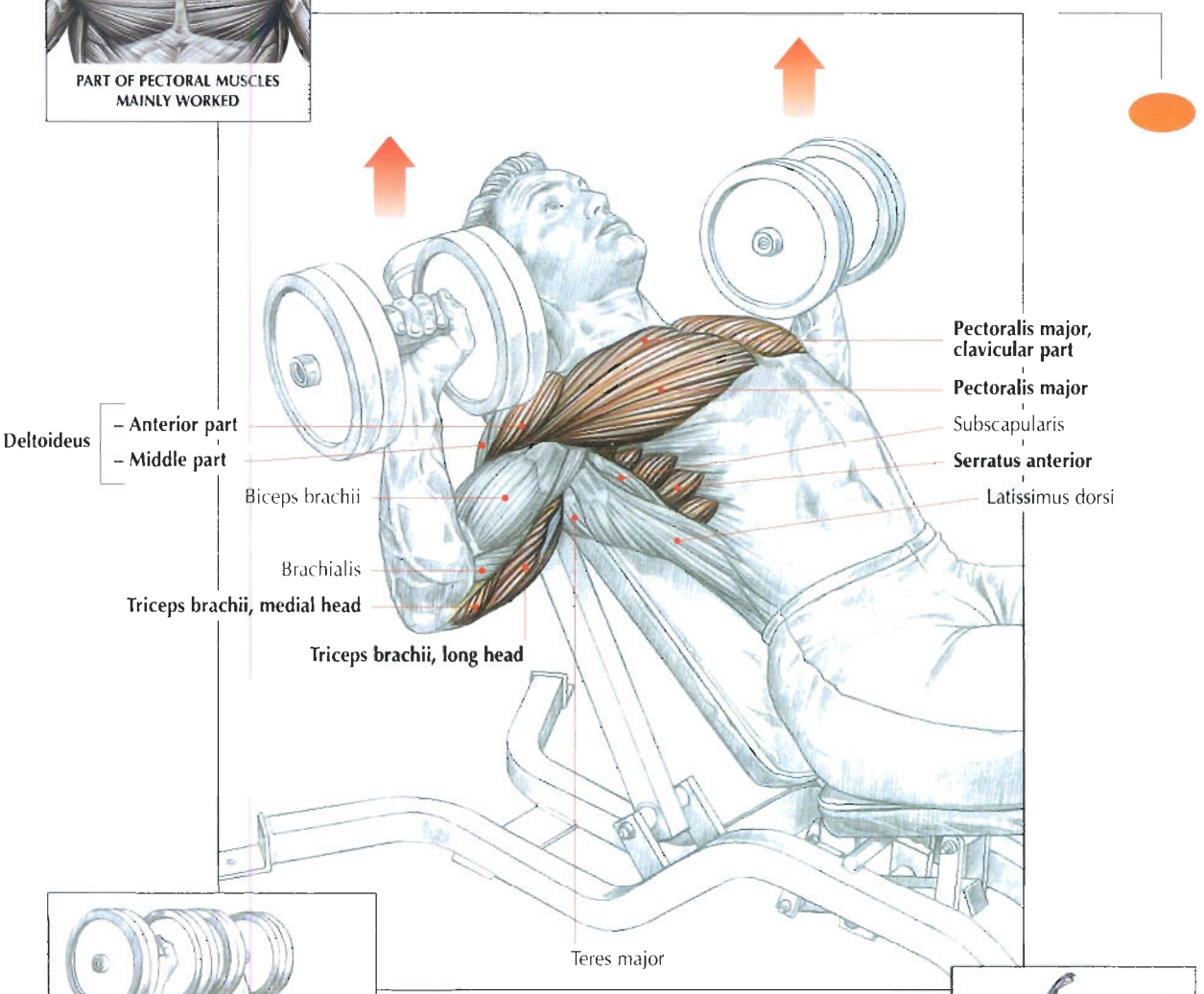
– Inhale, then lower the dumbbells until your elbows are at shoulder height
– Raise the dumbbells back up while exhaling
– Perform a short isometric contraction at the end of the movement to place more focus on the upper pectorals (sternal part)

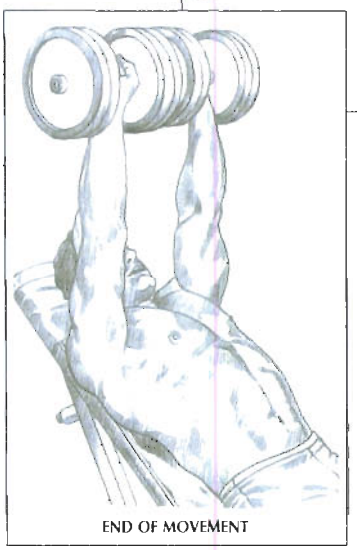
This exercise should never be performed with heavy weight. It isolates the pectoralis major and is an excellent movement for improving flexibility.

INCLINE DUMBBELL PRESS 9

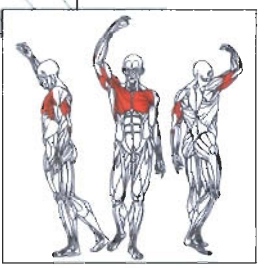


PART OF PECTORAL MUSCLES MAINLY WORKED





END OF MOVEMENT

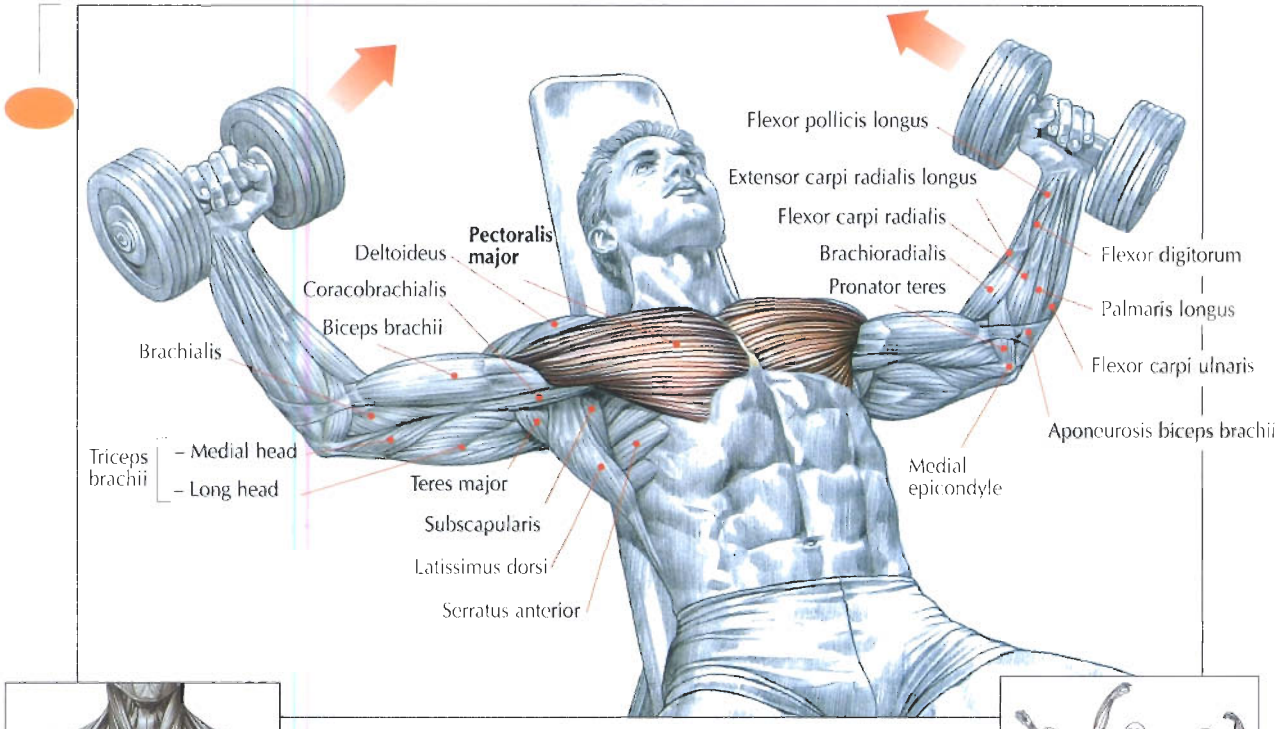


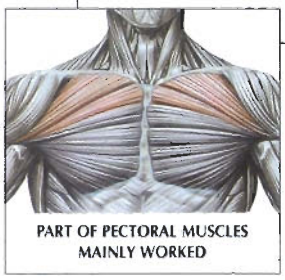
Lie on an incline bench (set at an angle less than 60 degrees to avoid placing too much emphasis on the deltoids) with your elbows bent. Hold the dumbbells with an overhand grip:
– Inhale and extend your arms until the weights touch
– Exhale as you complete the movement

This exercise—halfway between the incline press and incline dumbbell flys—works the pectorals (particularly the upper part) while stretching them. It also works the anterior deltoids, serratus anterior, and pectoralis minor (both stabilize the scapulae, 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.

10 INCLINE DUMBBELL FLYS

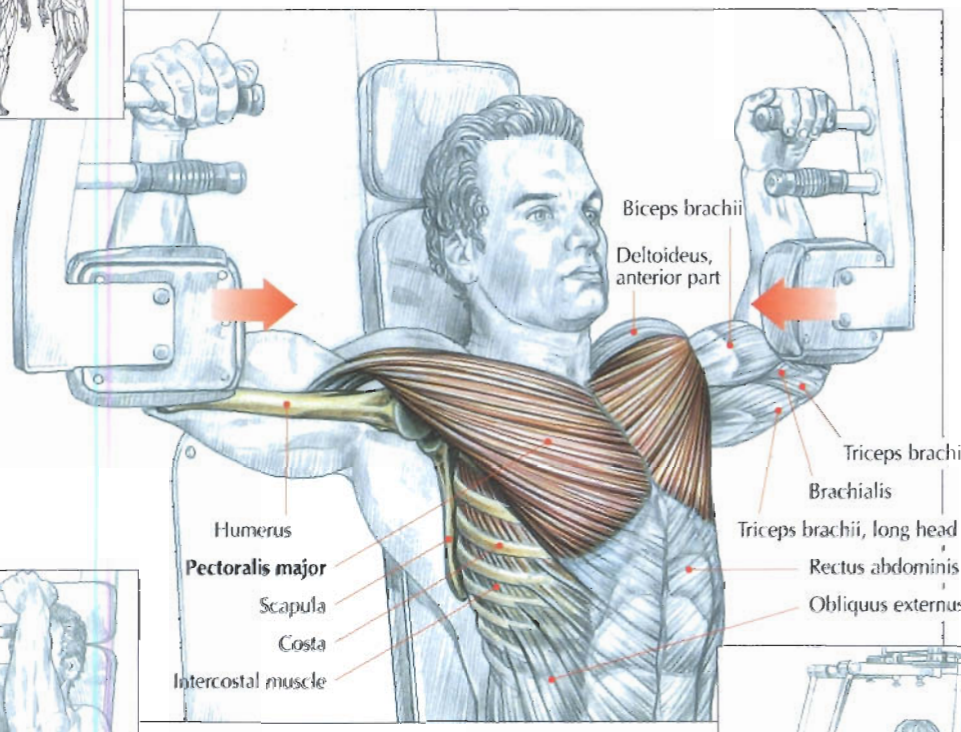


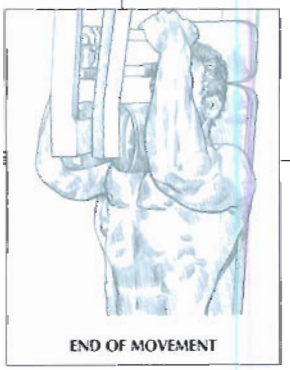

PART OF PECTORAL MUSCLES MAINLY WORKED

Lie on an incline bench set at an angle between 45 and 60 degrees. Hold the dumbbells with your arms extended or slightly bent to lessen the stress on the elbow joint:
- Inhale, then lower the dumbbells until your elbows are at shoulder height
- Raise the dumbbells while exhaling

Never perform this movement with heavy weight. This exercise isolates the pectorals (particularly the upper part). With the pullover, it is one of the basic exercises to stretch your rib cage.

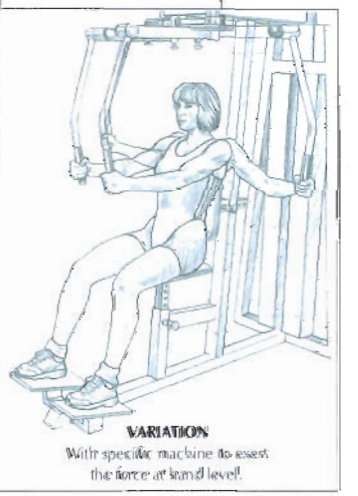
PEC DECK FLYS 11



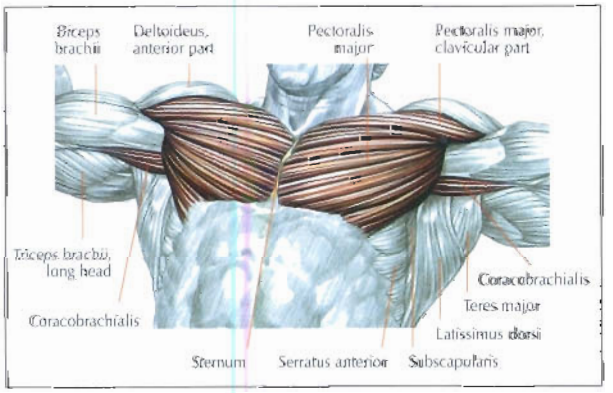


END OF MOVEMENT

Sit on the machine's seat and press **your elbows into the pads, relaxing** your forearms and **wrists:**
- Inhale and force the pads together until they touch in front of your chest
- Exhale as you complete the movement

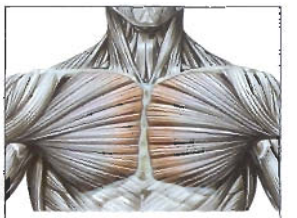


VARIATION
With specific machine to exert the force at head level

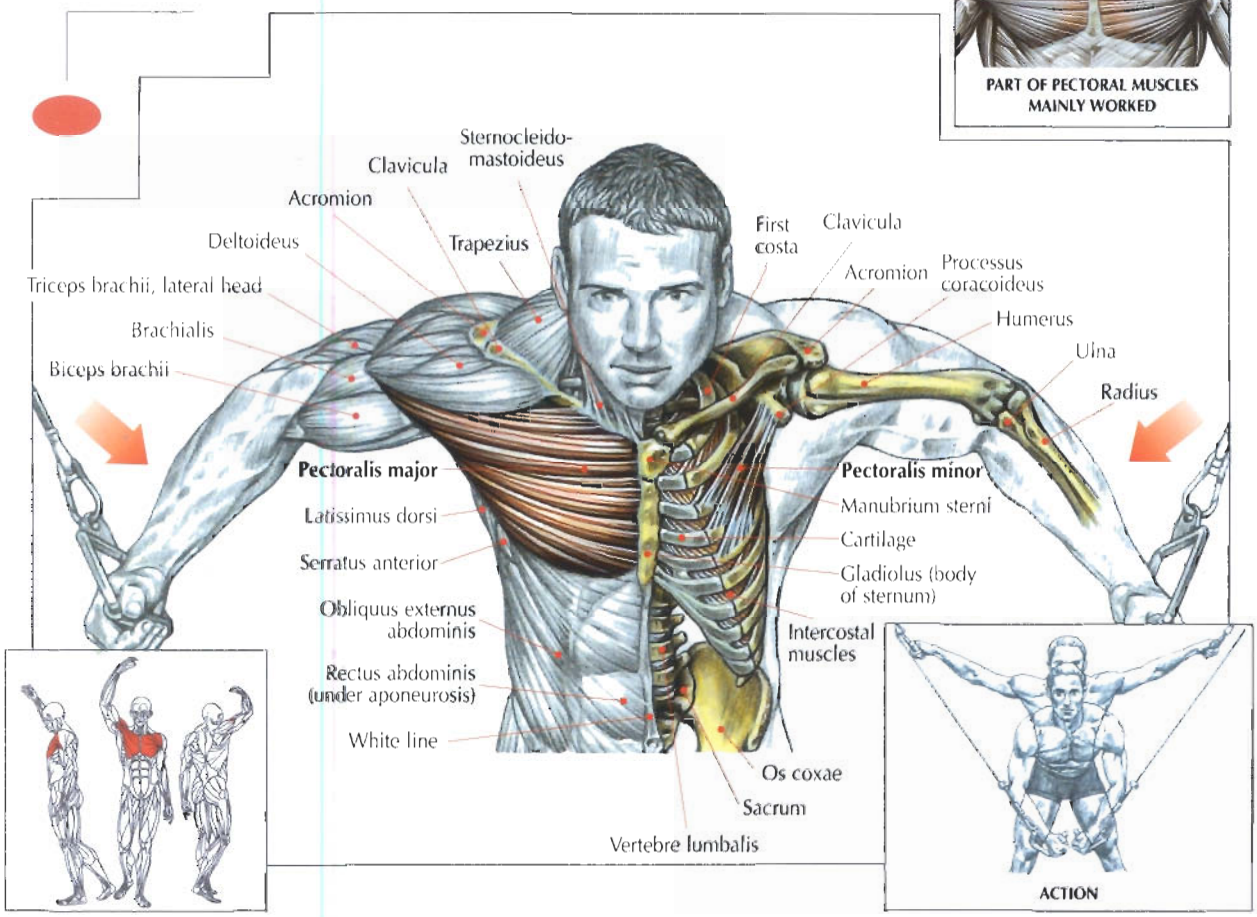


This exercise works and stretches the pectoralis major. It also develops the coracobrachialis and the biceps short head. It is recommended for beginners because it allows them to gain sufficient strength before advancing to more complex movements.

12 CABLE CROSSOVER FLYS



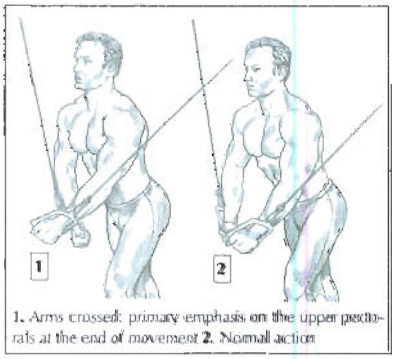
PART OF PECTORAL MUSCLES MAINLY WORKED



ACTION

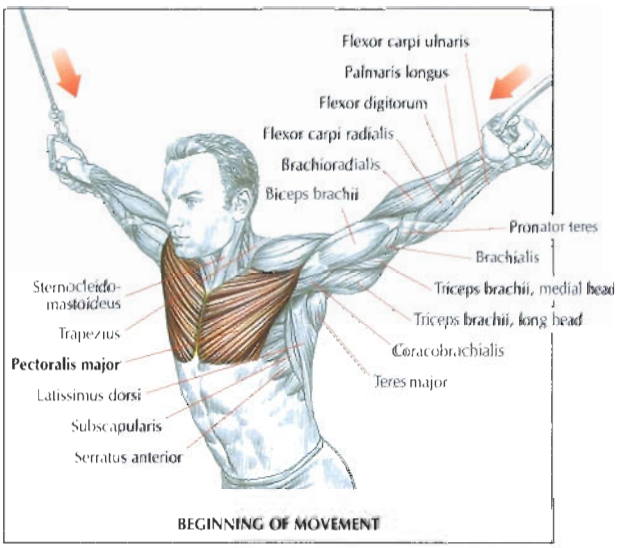
Stand with your feet slightly spread, your body slightly forward, and your elbows slightly bent. Hold the handles with your arms spread:
– Inhale and press the cable handles forward until your hands touch
– Exhale as you complete the contraction

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



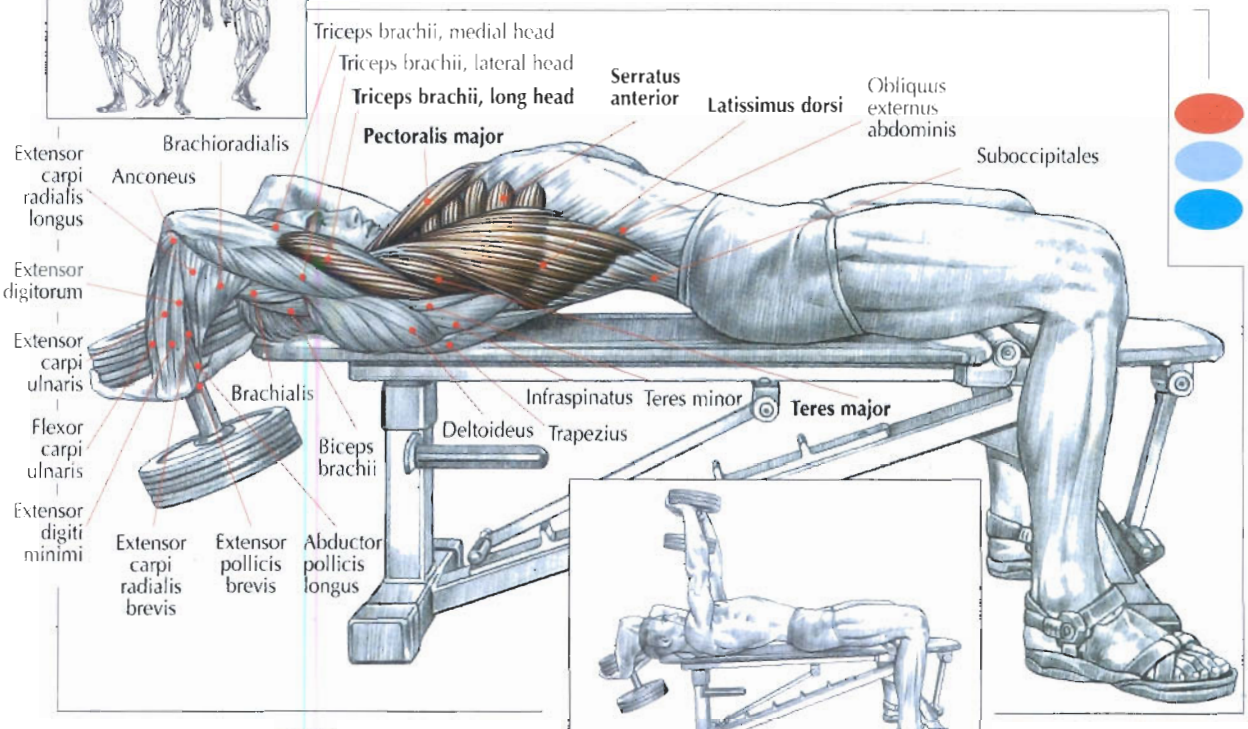
1. Arms crossed: primary emphasis on the upper pectorals at the end of movement **2.** Normal action

Note: cable crossover flys also involve the pectoralis minor under the pectoralis major. Besides stabilizing the scapulae, the pectoralis minor functions to protract the shoulder.



BEGINNING OF MOVEMENT

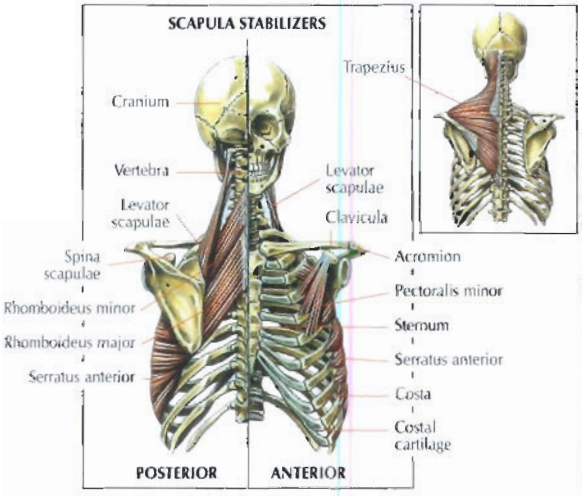
DUMBBELL PULLOVERS 13

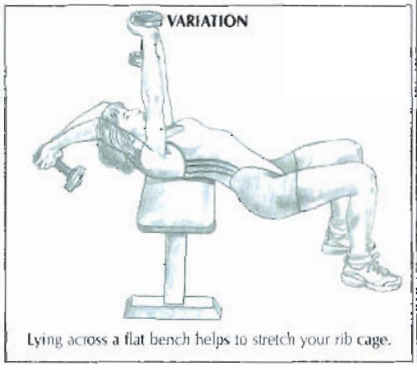


Lie on the bench, with your feet on the floor. Hold a dumbbell with both hands, palms against the underside of the upper set of plates, thumbs and forefingers encircling the handle:

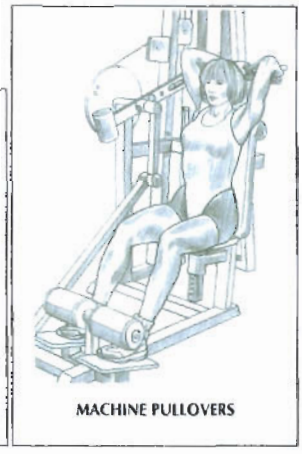
- Inhale as you lower the weight behind your head, slightly bending your elbows
- Return to the starting position, exhaling

This exercise develops the entire pectoral muscle and works the triceps long head, teres major, lats, serratus anterior, rhomboids, and pectoralis minor. You can do this movement to stretch your rib cage. To do so, use a light dumbbell and make sure you bend your elbows slightly. If possible, use a convex 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 raise the dumbbell.



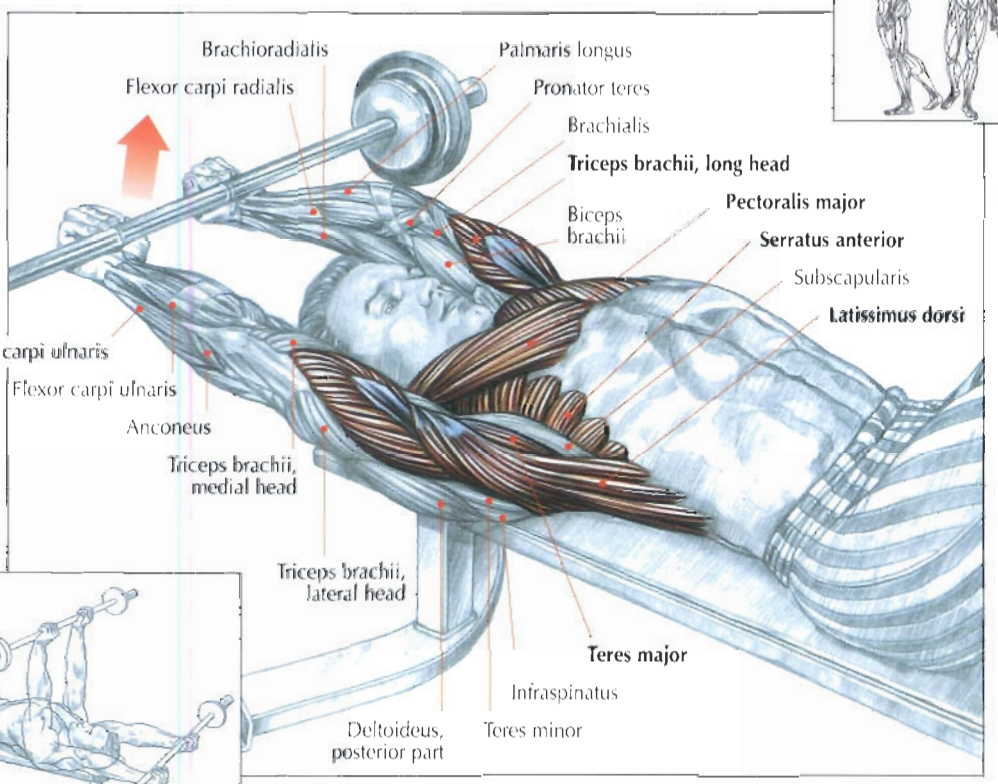


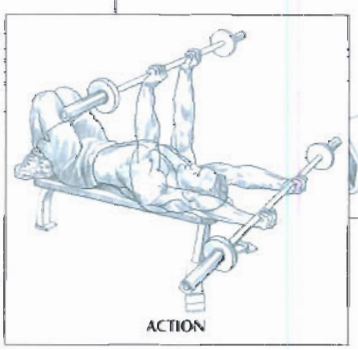
Lying across a flat bench helps to stretch your rib cage.



MACHINE PULLOVERS

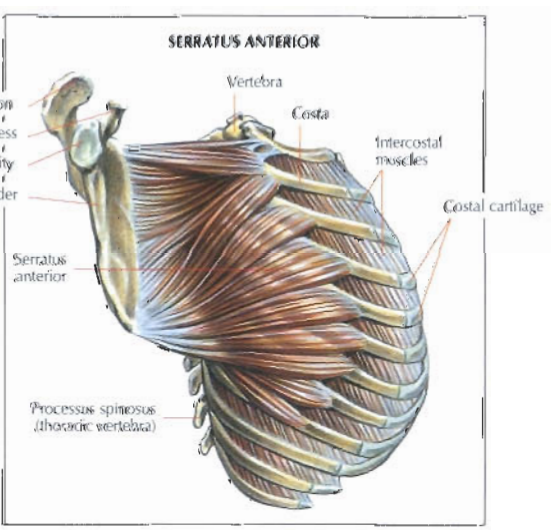
14 BARBELL PULLOVERS

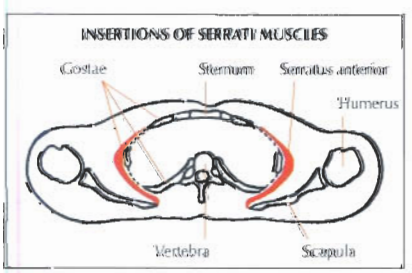




Extend your arms and take an overhand grip on the barbell with your hands shoulder-width apart:
- Inhale, filling your lungs, as you lower the barbell behind your head, bending your arms slightly
- Exhale as you return to the starting position

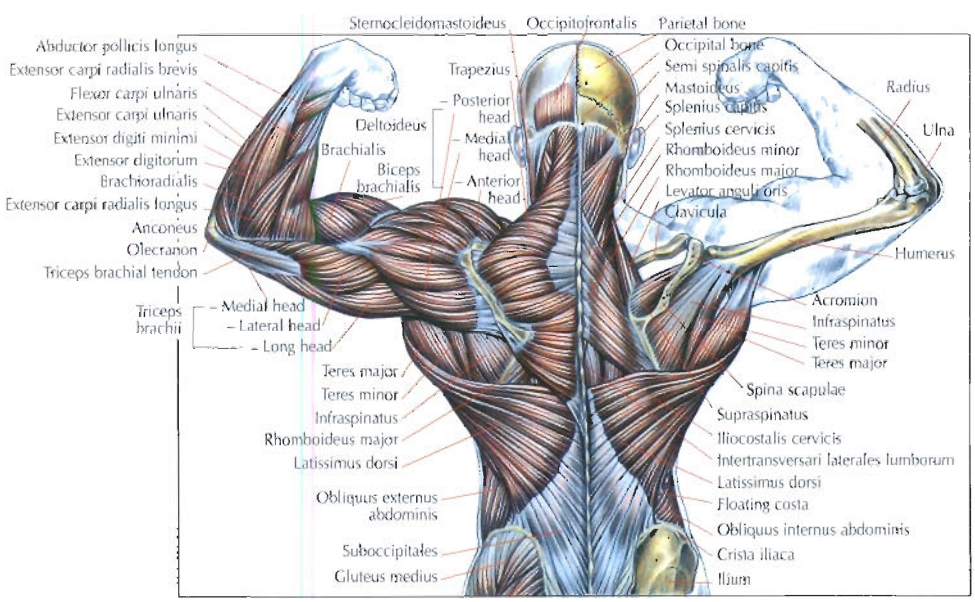
This exercise develops the pectoralis major, triceps long head, teres major, lats, serratus anterior, rhomboids, and pectoralis minor. It is an excellent movement for stretching the rib cage. To do so, use a light barbell and don't forget to position yourself and breathe correctly.



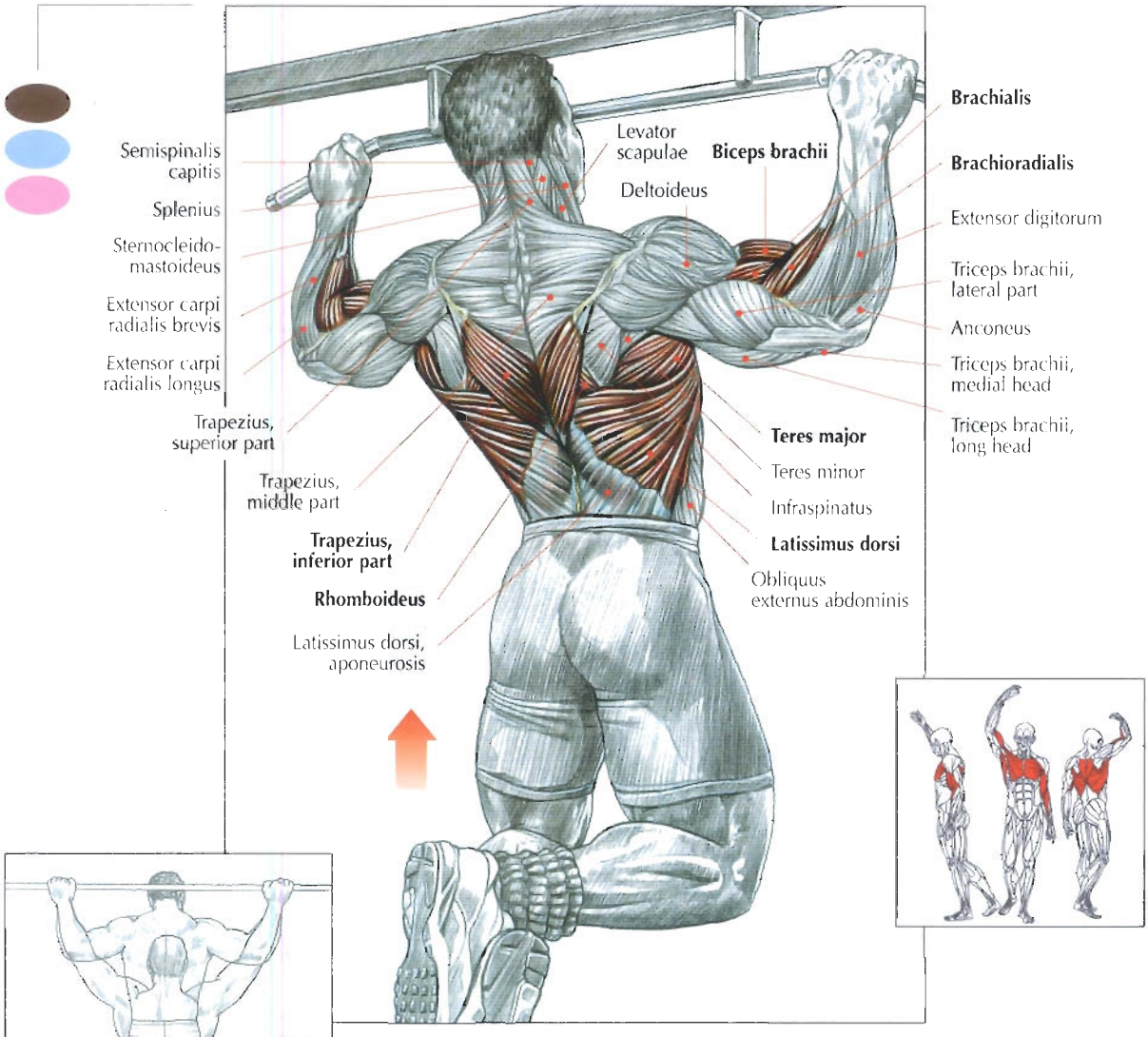


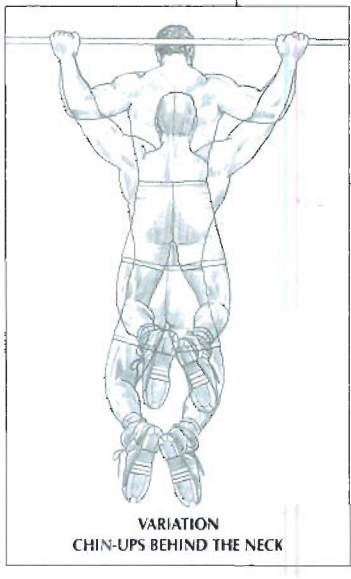
4 BACK

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



1 CHIN-UPS





VARIATION
CHIN-UPS BEHIND THE NECK

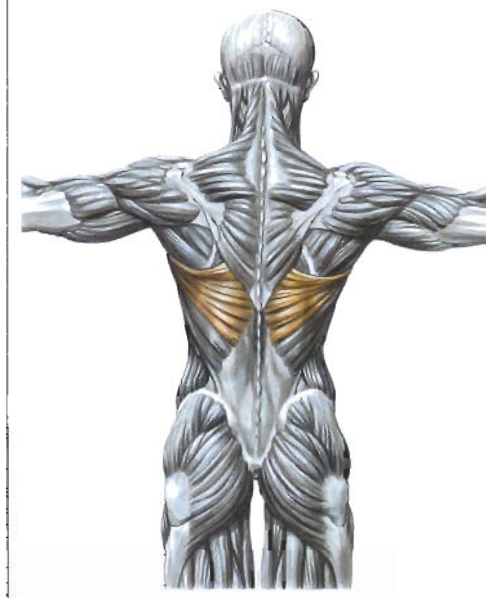
Extend your arms and take a wide, overhand grip on a chinning bar:
– Inhale and pull yourself upward until your eyes are above the level of the bar
– Exhale as you complete the movement

This full-back exercise requires greater strength. It is an excellent movement for working the biceps, brachialis, brachioradialis, and pectoralis major.

CHIN-UPS BEHIND THE NECK
ARMS OUT TO THE SIDES

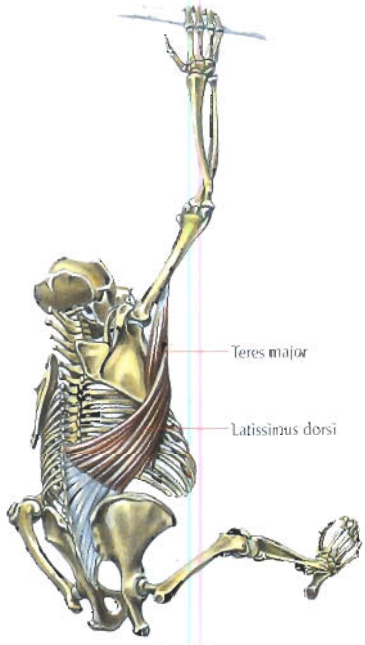
Primary emphasis on the lower lats

FRONT CHIN-UPS
ELBOWS TO THE REAR



Primary emphasis on the upper lats

Variation:
If you stick out your chest, you can pull yourself up so the bar touches your chin. 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 mainly involves the upper and lats, as well as the teres major.



In monkeys and men, the teres major and latissimus dorsi are well developed.

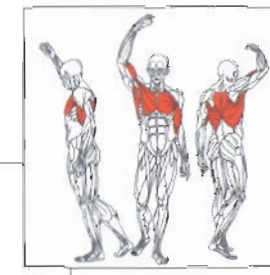
This exercise adds thickness to the back. When you pinch your scapulae together, the rhomboids and the inferior part of the trapezius are also worked.

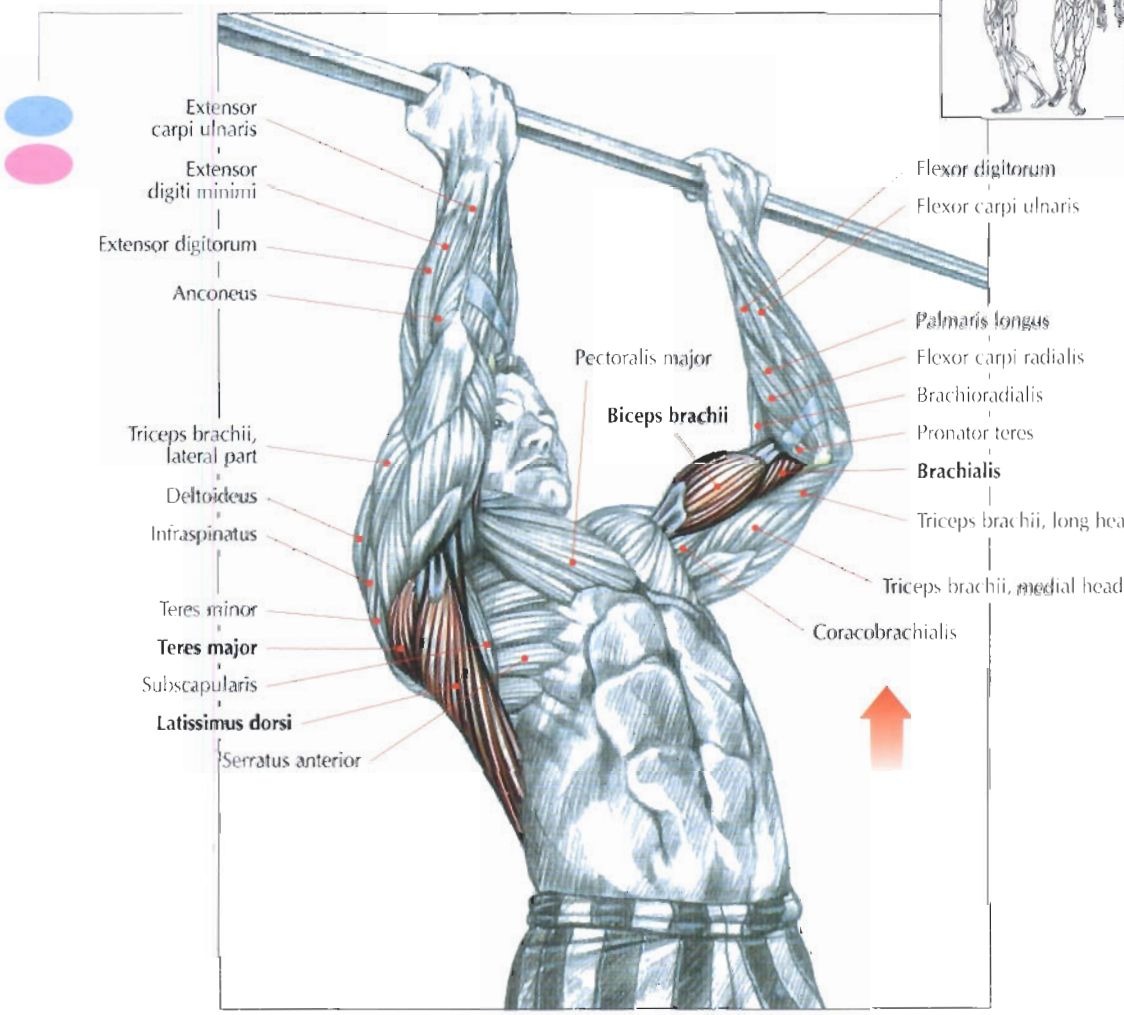
EVOLUTIONARY THEORY

Originally, the teres major and latissimus dorsi were involved in making our remote ancestors walk on all fours. They mainly worked on the forelegs as reverse thrusters. With the transition to arboreal life, they became powerful muscles specialized in vertical movement. When our ancestors returned to the ground, they adopted 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, walls, ladders, and so forth.

Note: the main difference between our locomotor system and that of the apes lies in the development of our lower limbs, which are specialized for bipedalism. Our chest and upper limbs have quite the same structure and proportions as those of the apes. Contrarily to fallacies, apes don't have long arms: humans have long legs.

2 REVERSE CHIN-UPS

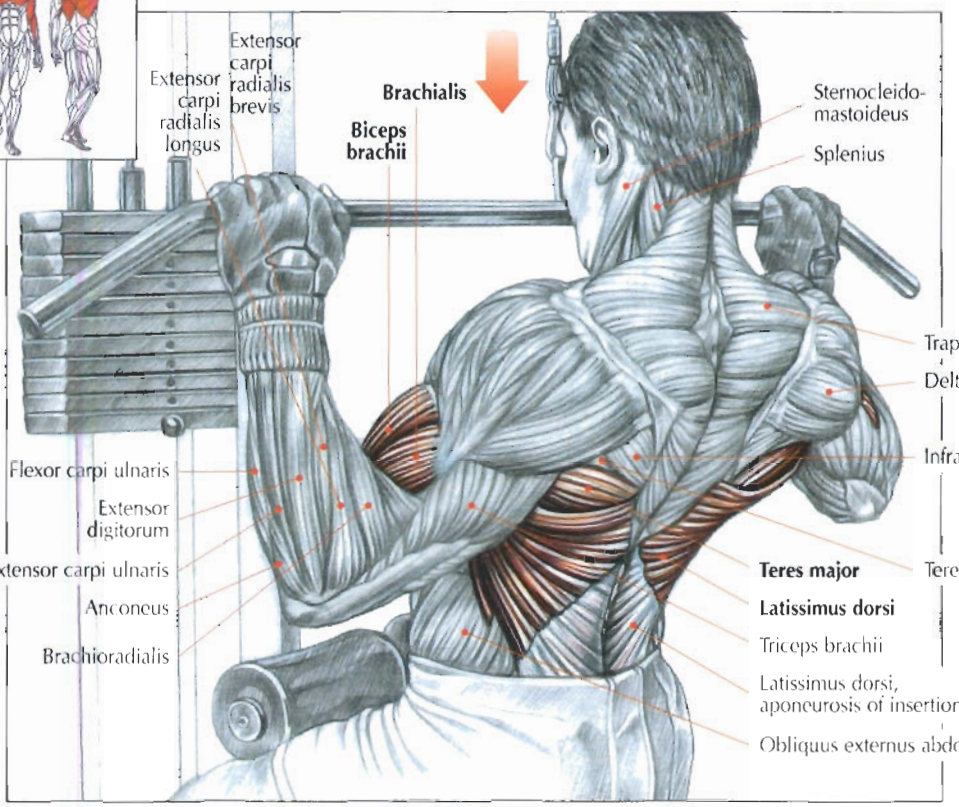


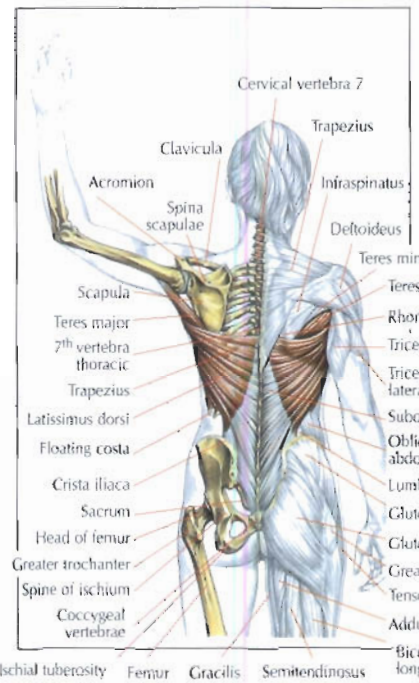


Extend your arms and take an underhand grip on the bar with your hands shoulder-width apart:
– Inhale and stick your chest out to pull yourself upward until your chin is at the level of the bar
– Exhale as you complete the movement

This movement develops the lats and teres major. It places intense focus on the biceps and brachialis. For that reason it can be integrated into a program focused on training the arm region. The trapezius (middle and lower portions), rhomboids, and pectorals are also involved. This exercise requires greater strength. It is easier to perform using a high pulley.

LAT PULLDOWNS 3



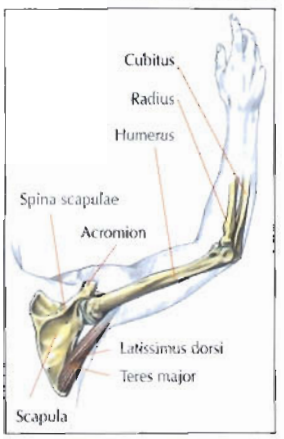


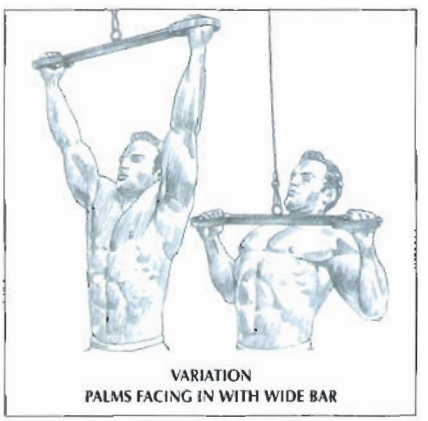
Sit facing the machine and wedge your knees under the restraint pad provided. Take a very wide overhand grip on the bar:

– Inhale and pull the bar down to your upper chest, arching your back and bringing your elbows back

– Exhale as you complete the movement

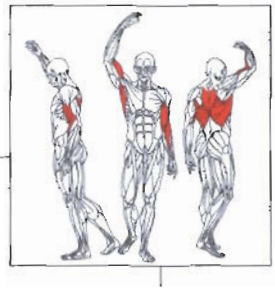
This exercise is excellent for adding thickness to the back. It particularly stresses the center part of the lats. It also places emphasis on the trapezius (middle and lower portions), rhomboids, biceps, brachialis, and, to a lesser extent, on the pectorals.

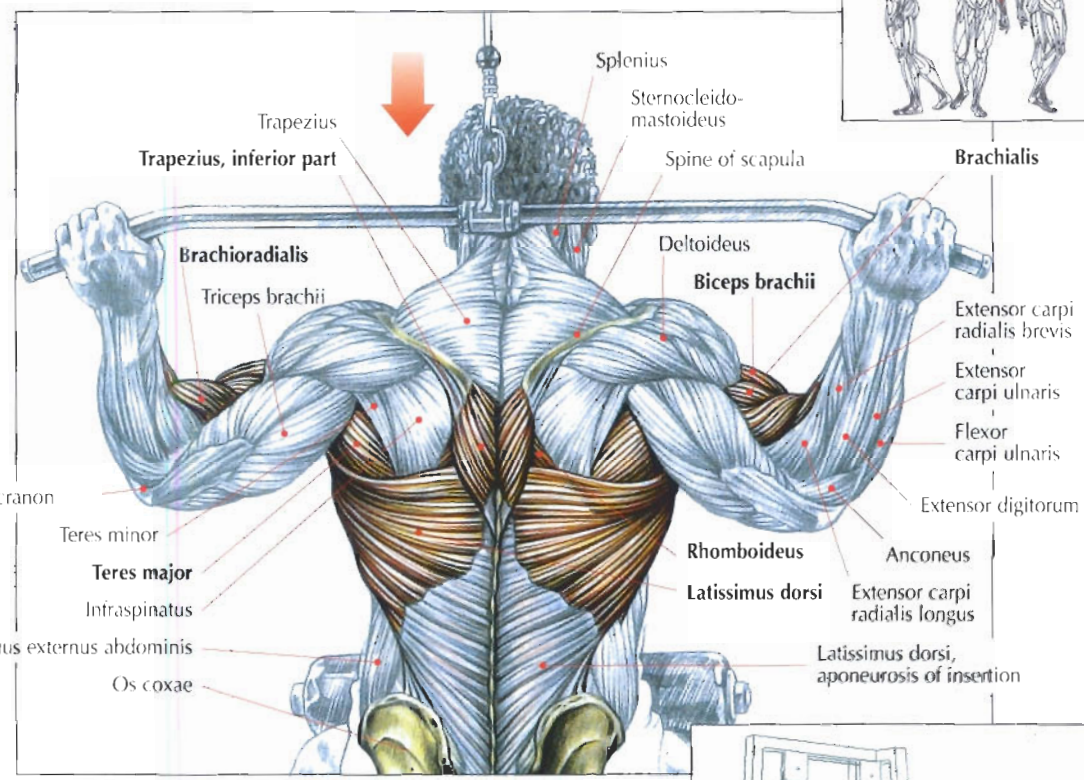




VARIATION
PALMS FACING IN WITH WIDE BAR

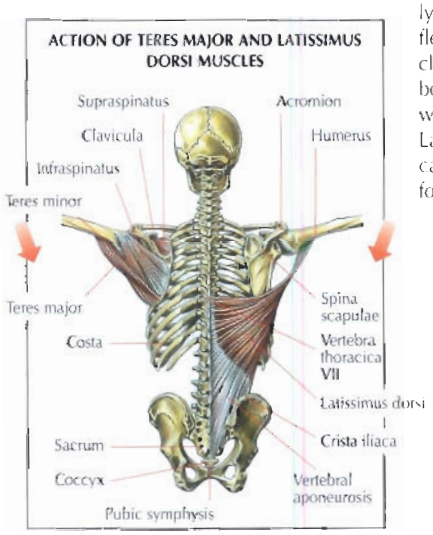
4 BACK LAT PULLDOWNS

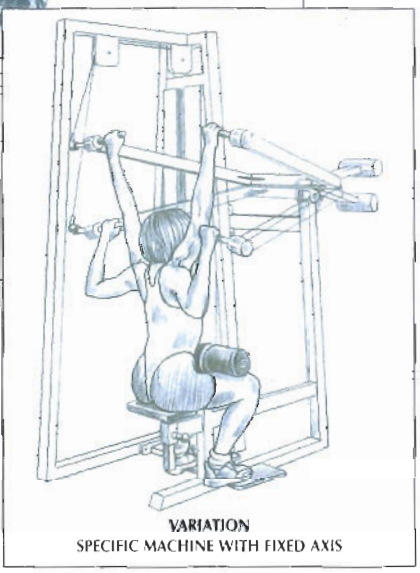




Sit facing the machine and secure your thighs under the restraint pad. Take a very wide overhand grip on the bar:
- Inhale and pull the bar down behind your neck, bringing your elbows back as you pull
- Exhale as you complete the movement

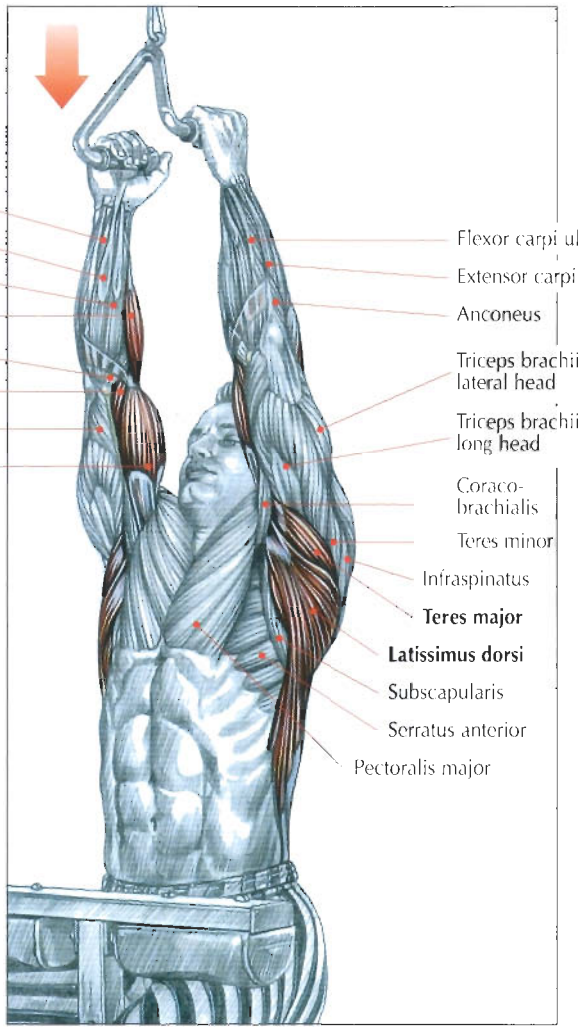
This is an excellent exercise for enhancing the back's width. It works the lats, particularly the lower part. It also works the forearm flexor muscles, biceps, brachialis, and brachioradialis in conjunction with the rhomboid and lower trapezius muscles, which work to press the scapulae together.
Lat pulldowns are great for beginners because they allow you to gain strength before trying the chin-ups.

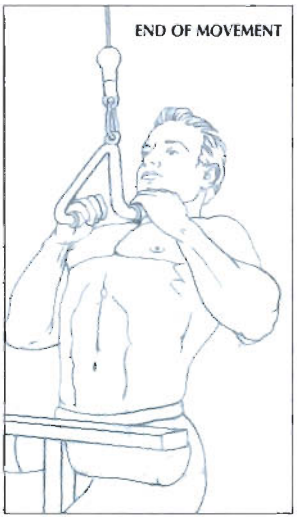




VARIATION
SPECIFIC MACHINE WITH FIXED AXIS

CLOSE-GRIP LAT PULLDOWNS 5

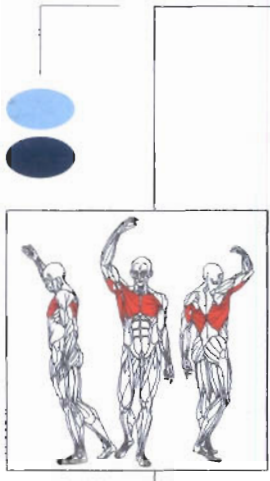


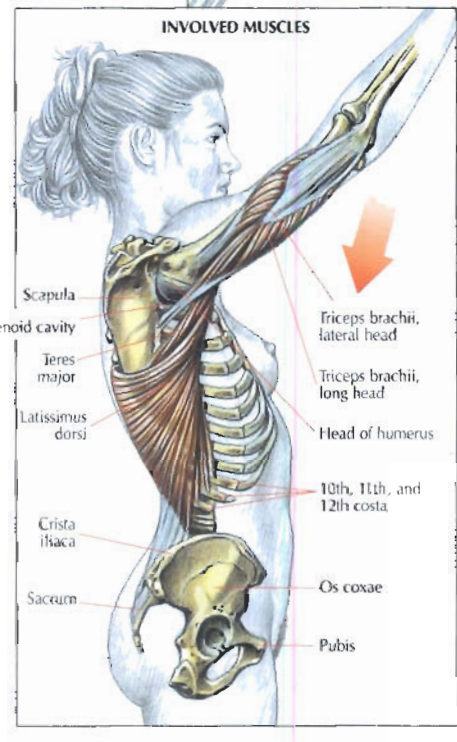


Sit facing the machine and wedge your knees under the restraint pad. Grip the handles with your palms facing toward each other:
– Inhale and pull the handle down to touch the upper part of your chest, arching your back and slightly tilting your upper body backward
– Exhale as you complete the movement

This is an excellent exercise for developing the lats and teres major. When you pinch your scapulae together, you work the rhomboids, trapezius, and posterior deltoids. Every pulldown exercise works the biceps and brachialis and places intense emphasis on the brachioradialis.

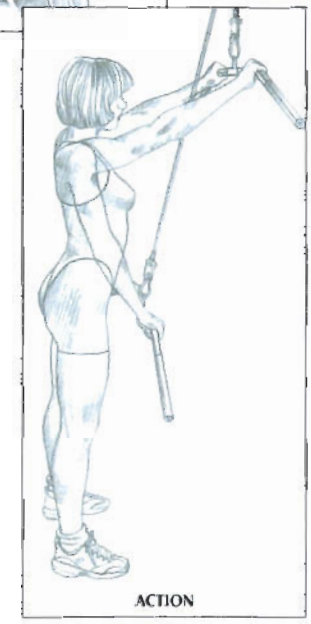
6 STRAIGHT-ARM LAT PULLDOWNS





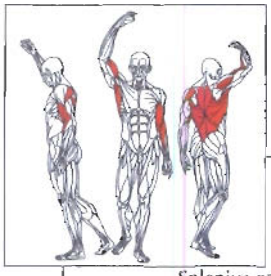
Stand facing the machine with your feet slightly apart. Take a shoulder-width overhand grip on the bar with your arms straight:
– Keep your back motionless and your abdominals contracted, inhaling
– Simultaneously, pull the bar down until it touches your upper thighs, keeping your elbows extended (or very slightly bent)
– Exhale as you complete the movement

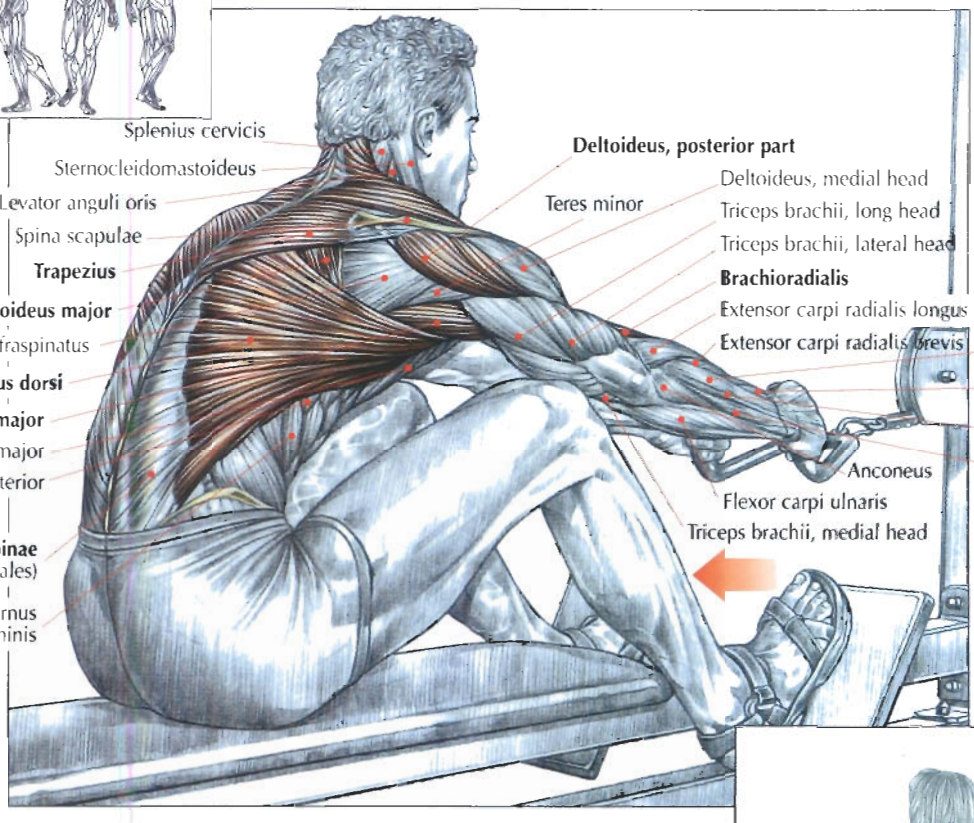
This exercise works the lats and strengthens the teres major and the triceps long head. By doing so, it partly contributes to maintaining a stable arm-torso junction.

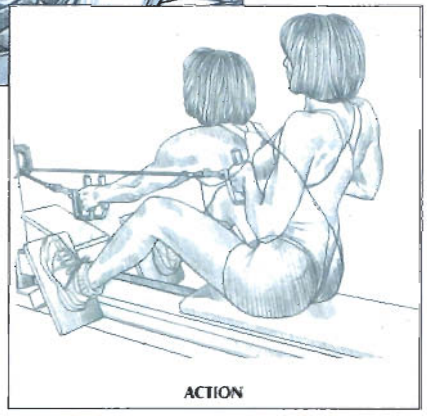


Swimmers may add to their stroke power by using this exercise to complement their training. Many international coaches have integrated this exercise into their swimming programs.

SEATED ROWS 7



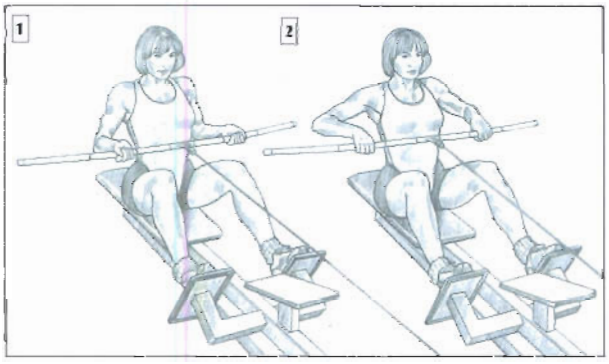




Sit facing the machine. Place your feet against the foot stops and lean toward the pulley:
– Inhale and pull the handle until it touches your lower rib cage, arching your back
– As you pull the handle toward your torso, be sure your elbows travel as far backward as possible
– Exhale as you complete the movement

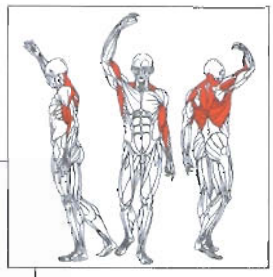
This is an excellent exercise for building the back. It isolates the lats, teres major, posterior deltoids, biceps, brachialis, brachioradialis, and, at the end of the movement when you press your scapulae together, the trapezius and rhomboid muscles. When you straighten, it also involves the spinal erectors. The negative phase of this movement, when you lean toward the pulley, completely stretches your lats.

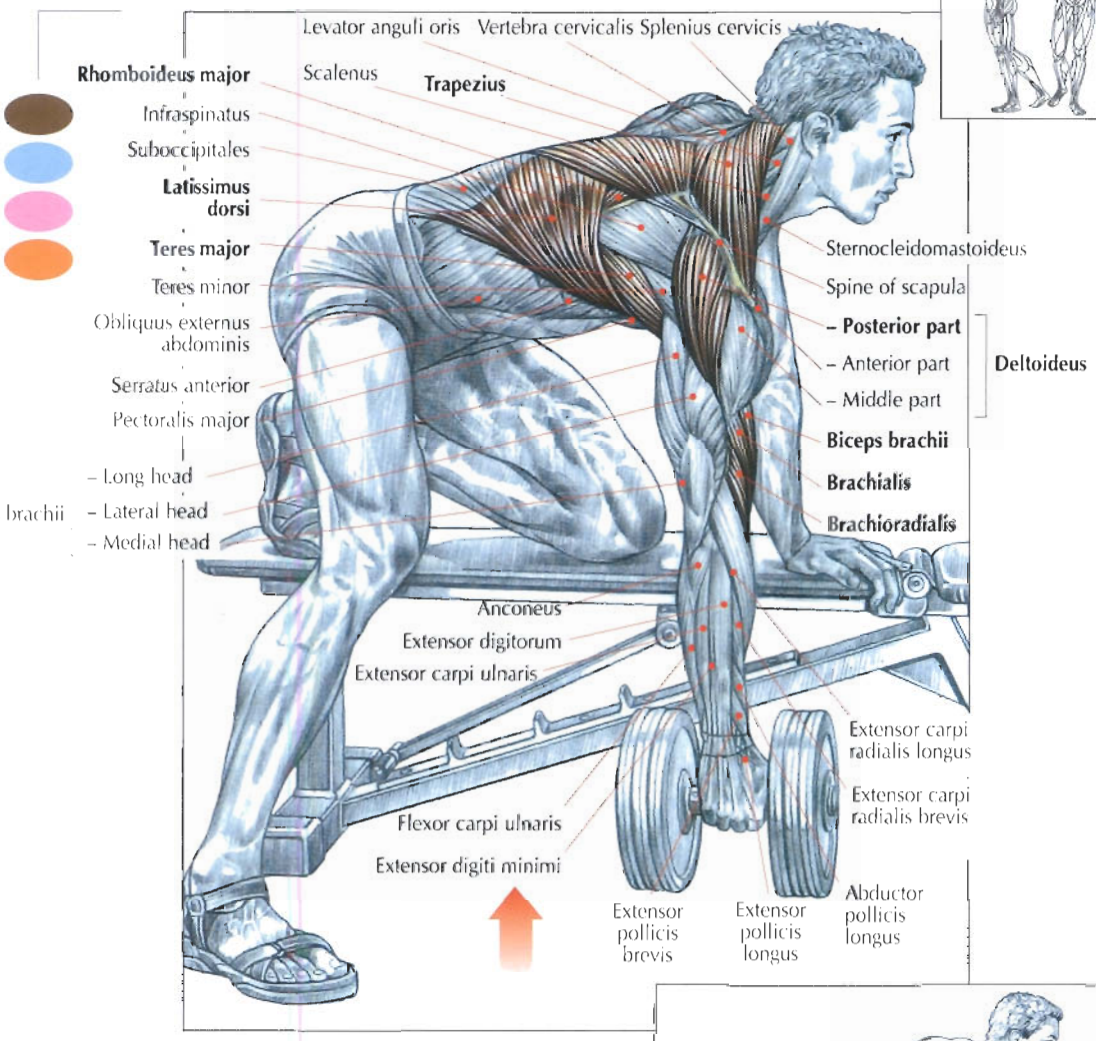
Warning: to avoid the likelihood of back injury, never round your back as you do low pulley rows with heavy weight.

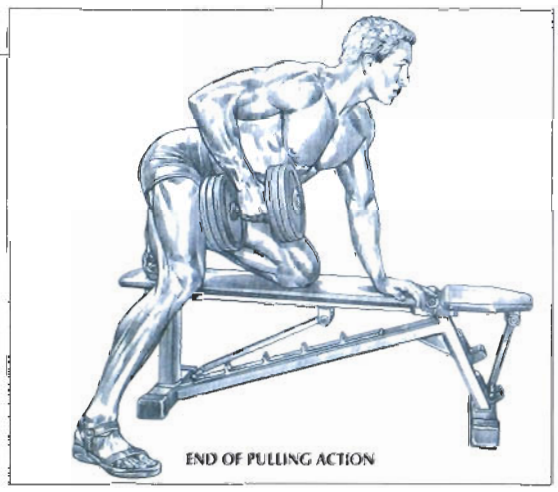


Straight-bar handle variation:
1. The underhand grip isolates the trapezius (lower portion), rhomboids, and biceps.
2. The overhand grip isolates the posterior deltoids and the middle portion of the trapezius.

8 ONE-ARM DUMBBELL ROWS



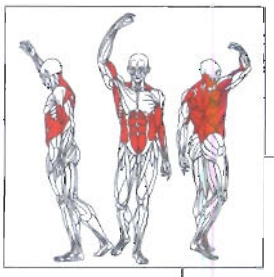


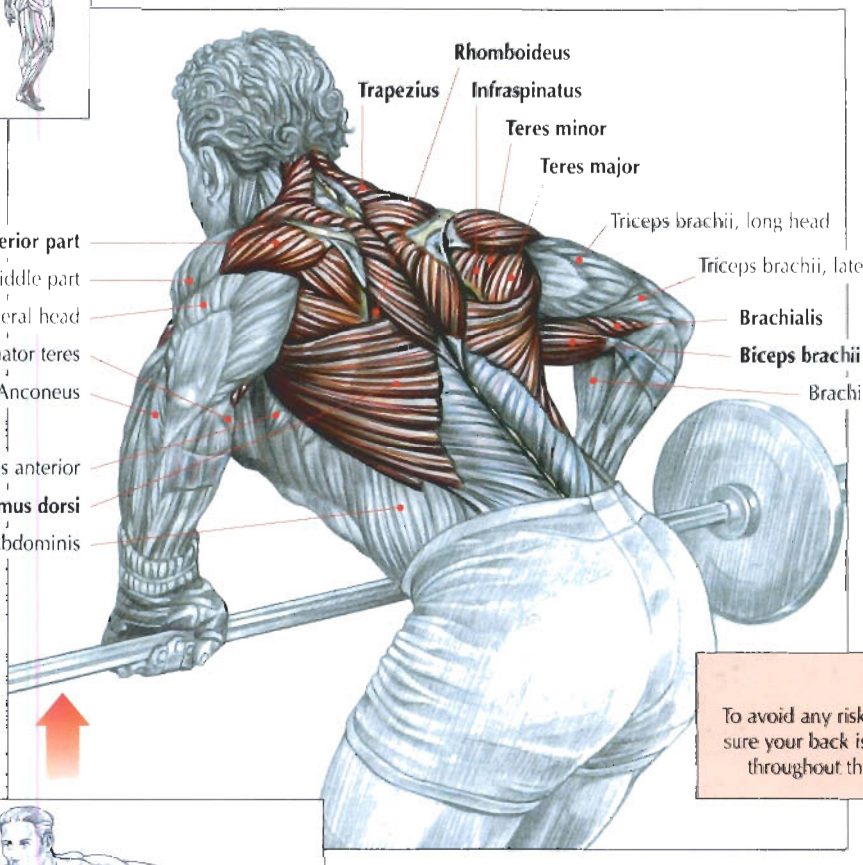


Grasp the dumbbell with your palm facing in. Rest the opposite hand and knee on a bench:
– Steady your upper body in position, inhale and pull the dumbbell as high as possible, keeping your elbow back
– Be sure your upper arm travels a little away from your torso
– Exhale as you complete the movement

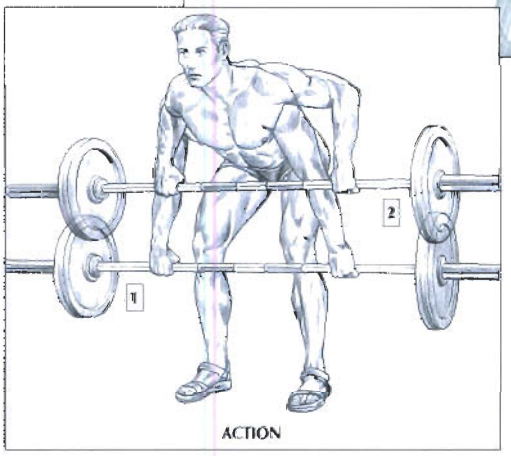
This exercise mainly works the lats, teres major, posterior deltoids, and the trapezius and rhomboid muscles at the end of the contraction. It places a secondary emphasis on the arm flexors, biceps, brachialis, and brachioradialis.

BENT ROWS 9



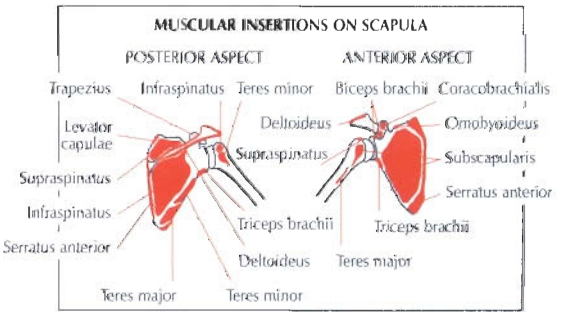


To avoid any risk of injury, make sure your back is never rounded throughout the movement.



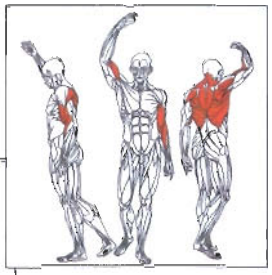
Stand with your knees slightly flexed. Bend your torso at an angle of about 45 degrees, keeping your back straight. Take an overhand grip on the bar with your hands more than shoulder-width apart and your arms dangling straight down from your shoulders:
– Inhale, contract your abdominals isometrically, and pull the bar straight up until it touches your chest;
– Return to the starting position, exhaling

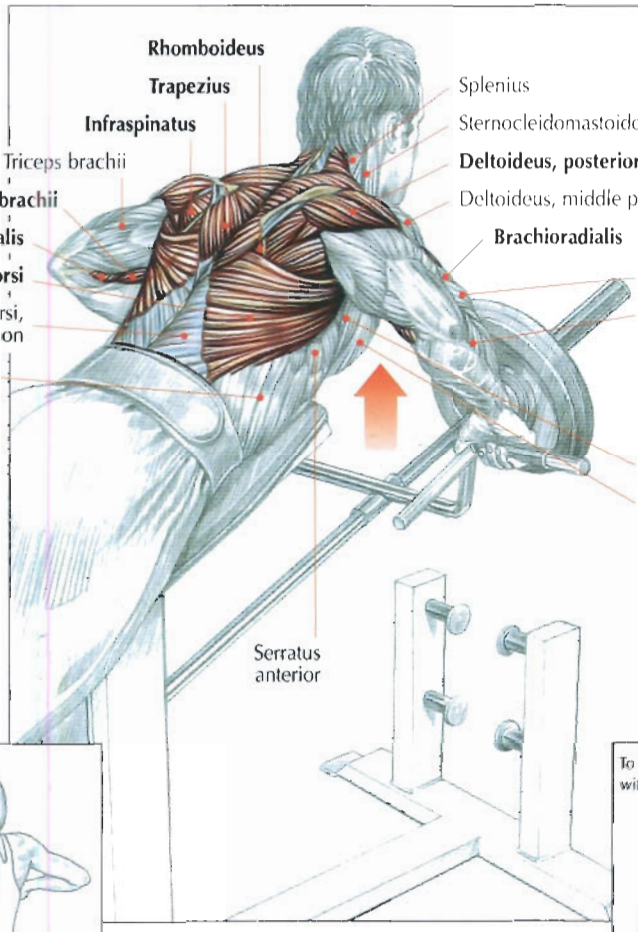
This exercise works the lats, teres major, posterior deltoids, arm flexors, biceps, brachialis, brachioradialis, and, when you press your scapulae together at the end of the movement, the rhomboid and trapezius muscles.



Bending over works the spinal erectors isometrically.
You can work the back region at various angles by experimenting with different grip widths and types (overhand or underhand), as well as by varying the forward tilt of your torso.

10 T-BAR ROWS



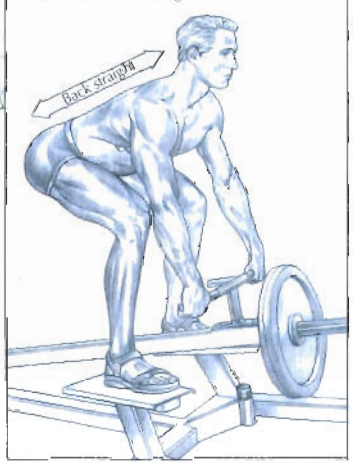


VARIATION WITH SPECIFIC MACHINE REPRODUCING T-BAR MOVEMENT

Stand on the platforms provided on each side of the T-bar. Keep your knees slightly bent and your back straight. Bend over at about a 45-degree angle or rest against the incline bench if one is provided:
– Inhale and pull the T-bar up until the plates contact your chest
– Exhale as you complete the movement

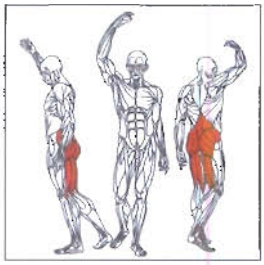
This exercise, similar to bent rows, places more emphasis on the back and requires less effort to set your body in the correct movement pattern. It works the lats, teres major, posterior deltoids, arm flexors, and the trapezius and rhomboid muscles.

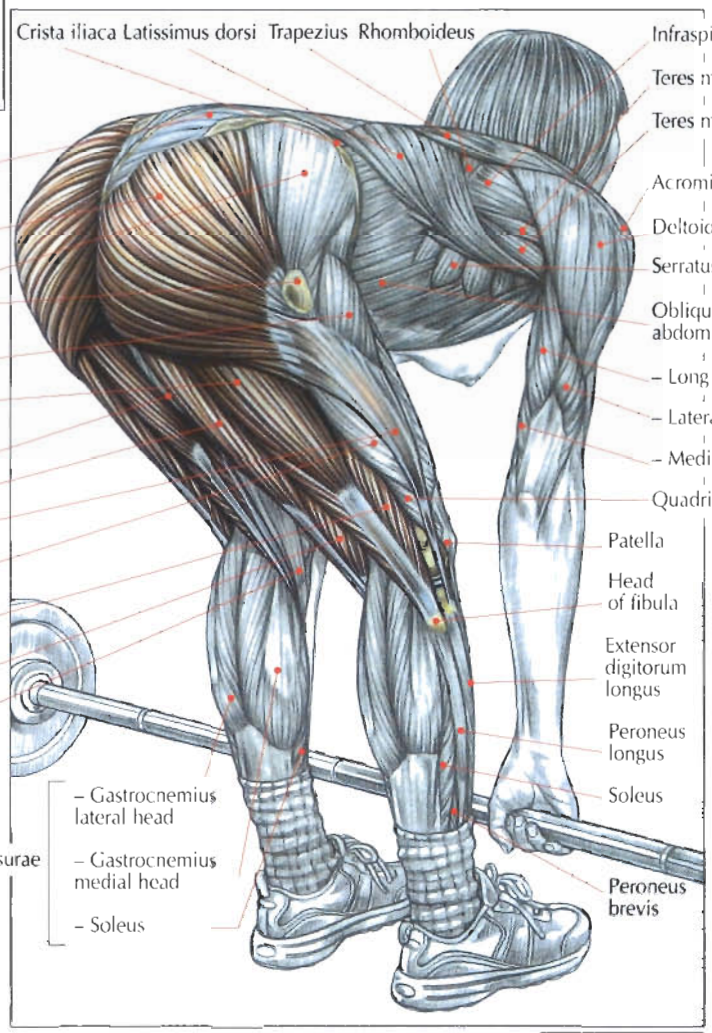
To avoid any risk of injury when doing T-bar rows without an incline bench, make sure your back is never rounded throughout the movement.

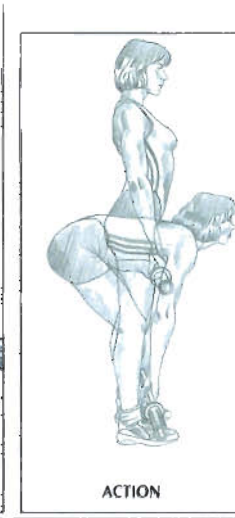


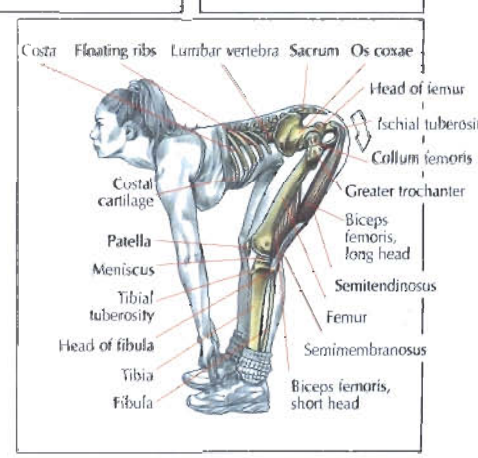
Note: if you take an underhand grip, you shift some work to the biceps and the upper portion of the trapezius at the end of the pull.

STIFF-LEGGED DEADLIFTS 11







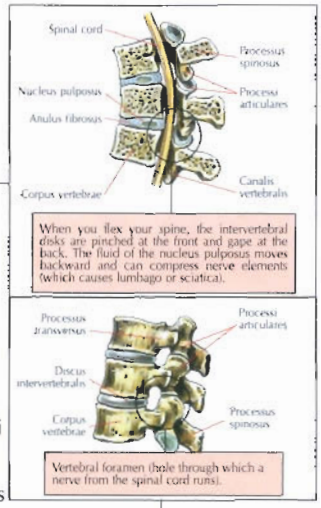


Stand with your feet placed fairly close to each other, facing the bar on the floor. Bend forward at the waist, keeping your back arched and, if possible, your legs straight. Take an overhand grip on the bar, with your arms relaxed:
– Inhale and straighten your body, flexing at the hips and keeping your back rigid
– Exhale 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 flex at the hips to straighten your body, it specifically works the muscles of the hips, buttocks, and thighs (but not the thigh biceps short head).
The stiff-legged deadlift exercise stretches the back of your thighs. In order to increase the range of motion, perform the exercise while standing on a thick block of wood.

Warning: people with back problems should perform this exercise with caution because of the high amount of stress on the lumbar spine.

12 DEADLIFTS



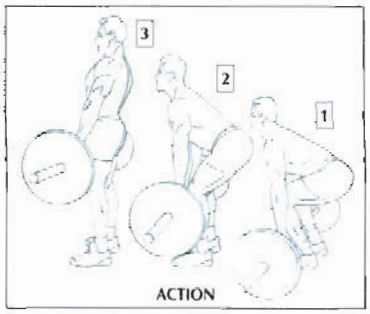
Stand facing the bar with your feet slightly spread. Keep your back motionless and a little arched. Flex your knees until your thighs are almost parallel to the floor. Depending on your physique and the flexibility of your ankles, you can vary this position (for example, if your thigh bones and arms are short, place your thighs in a horizontal position ; if your thigh bones and arms are long, place your thighs 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 over-under grip (one palm faces forward and the other faces back) to prevent the bar from rolling and to work with much heavier weight):

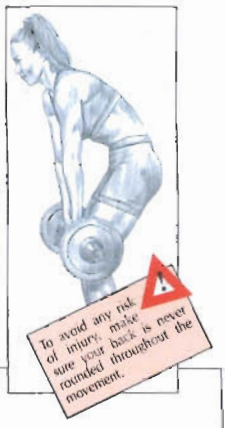
– Inhale, contract your abdominal and low back muscles, and lift the bar by straightening your legs (contracting your abdominals and keeping your back straight), raising it in front of your shins

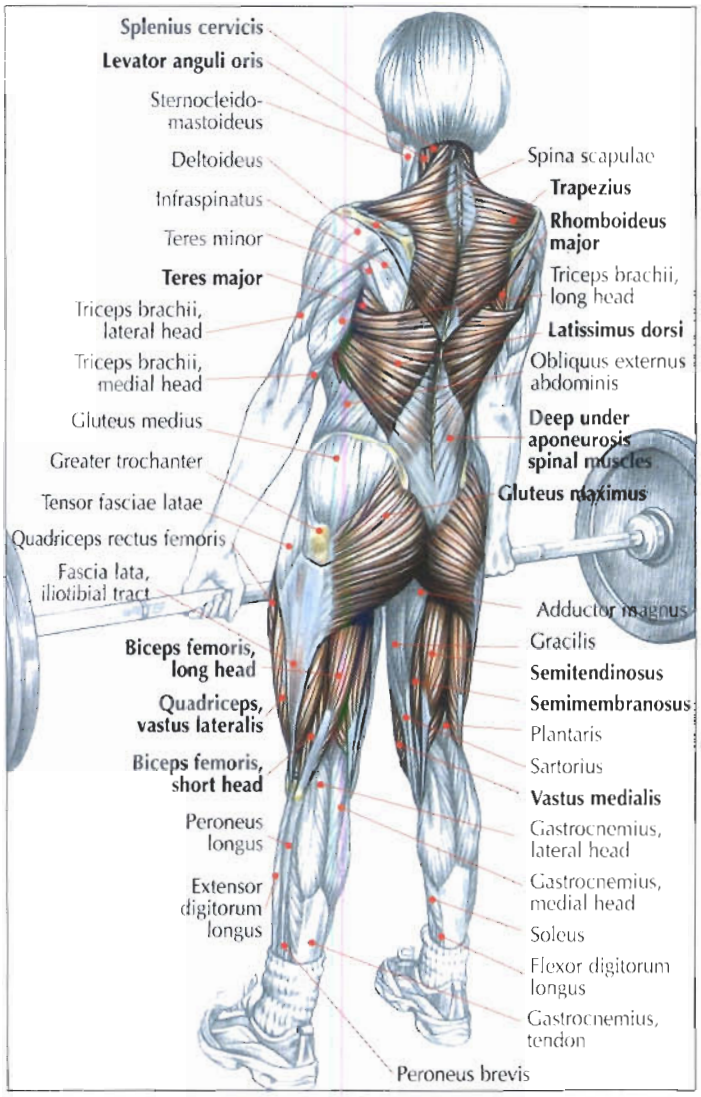
– When the bar reaches your knees, extend your torso so you are standing erect with your arms straight down at your sides, exhaling as you complete the movement

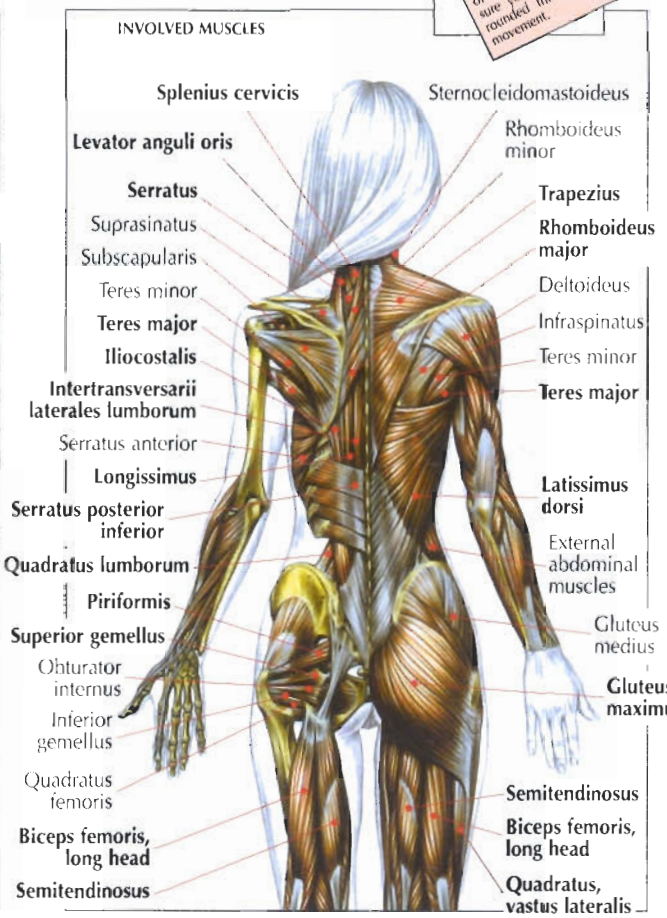
- Hold this straightened position for 2 seconds, then return the weight to the floor, making sure you do not hyperextend or arch your back

This exercise works virtually every muscle. It builds terrific hip, lower back, and trapezius muscle mass. It also involves the buttocks and quadriceps. With the bench press and the squat, it is one of the movements performed in powerlifting events.



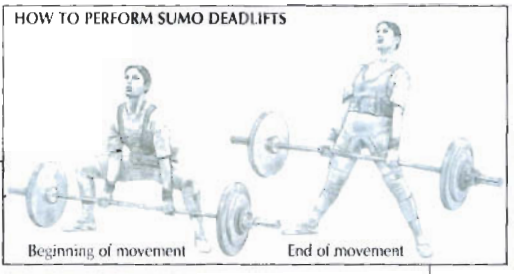


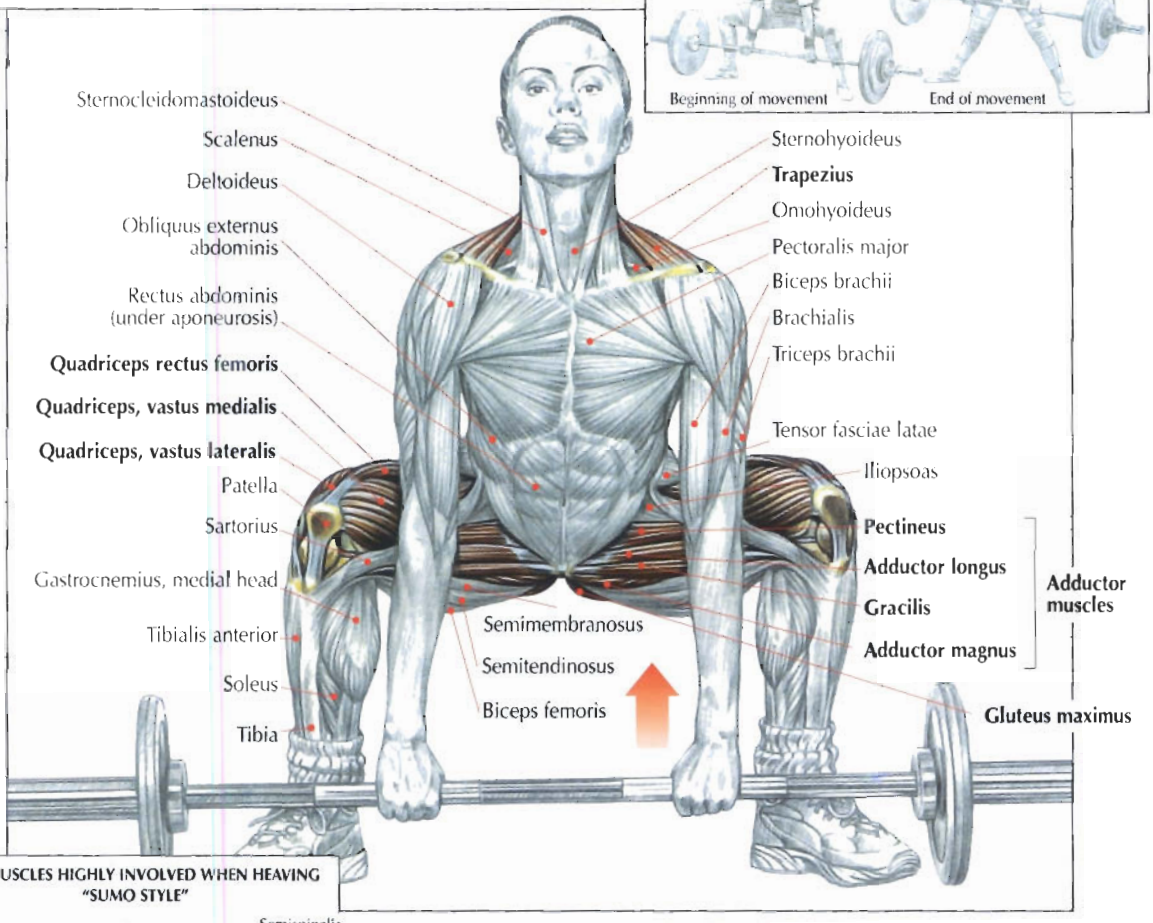


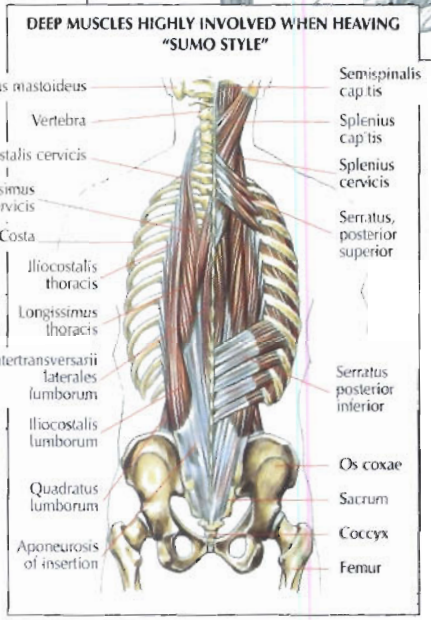


In any movement, whenever you use heavy weight, you must "**block.**"
1. Stick out your chest by taking a deep breath and filling your lungs with air like a balloon. In this way, you will stiffen your rib cage and prevent your upper torso from bending forward.
2. Contract all the abdominal muscles to increase intra-abdominal pressure so your shoulders are pulled back when you are in the top position of the movement.
3. Finally, contract 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 (or flexing the spine), which may cause a slipped disk if you work with heavy weight.

13 SUMO DEADLIFTS





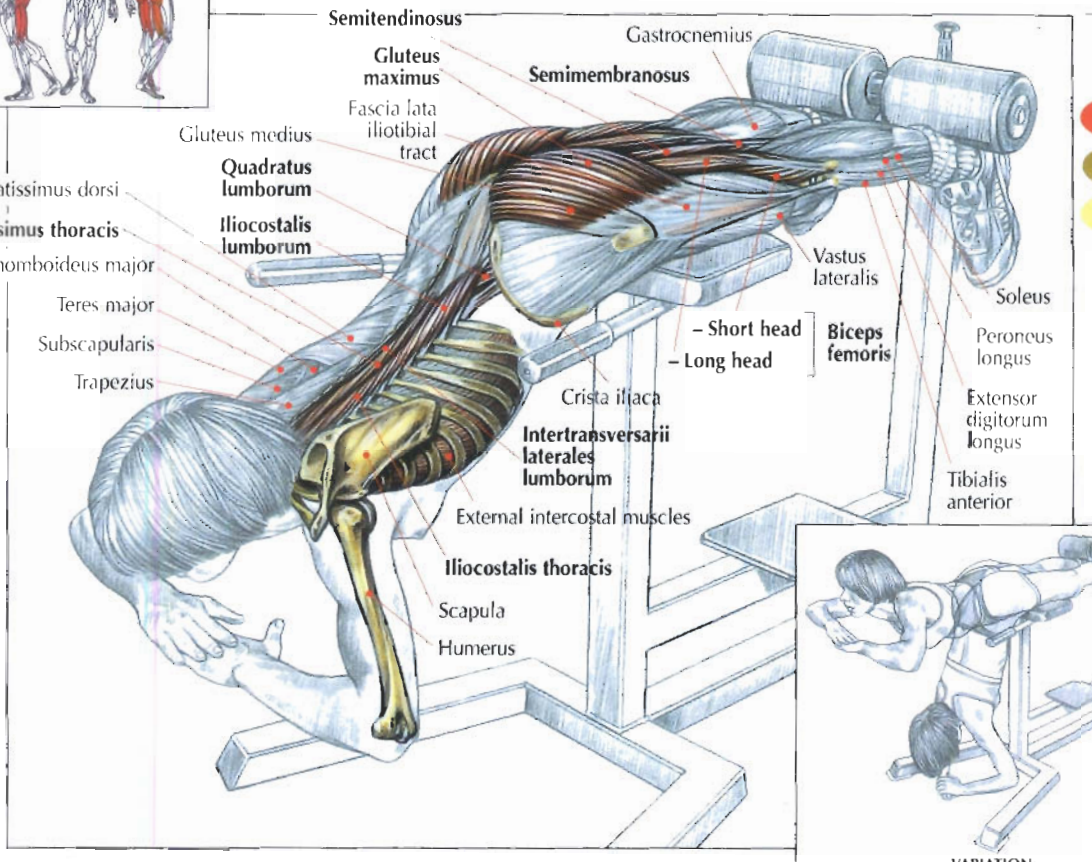


Stand facing the bar. Place your feet considerably wider than shoulder-width apart with your toes pointing outward, keeping them in line with your knees:
– Flex your knees until your thighs are parallel to the floor
– Take an overhand grip on the bar with your hands about shoulder-width apart, keeping your arms straight (use an over-under grip to lift heavier loads)
– Inhale, hold your breath, slightly arch your back, shoulders backward, contract your abdominals and straighten your legs, extending your torso to stand erect. Exhale.

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 bend as at the beginning.
When you lift heavy weight, be sure to do this movement very carefully; execute the proper technique to avoid traumatizing the hips and the adductors of the thighs, as well as the connection between the sacrum and the lumbar vertebrae, which is directly involved in the exercise.
The sumo deadlift is one of the three powerlifting movements.

Note: at the beginning of the movement, make sure you raise the bar in front of your tibias. At the end of the movement, keep your back straight, holding your breath.

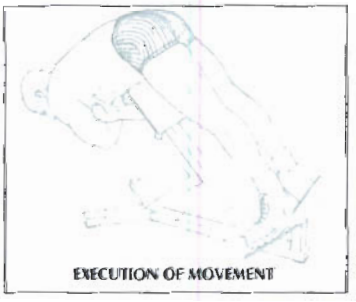
BACK EXTENSION 14



VARIATION:
Incline bench back extension

Lie face down on the Roman chair with the ankle supports (tibia pads) properly adjusted and your hips on the support pads:
– Start with your thighs flexed and raise your upper body to a position parallel to the floor
– Be sure to assume the proper arched position to reduce the chance of injury to the lower back

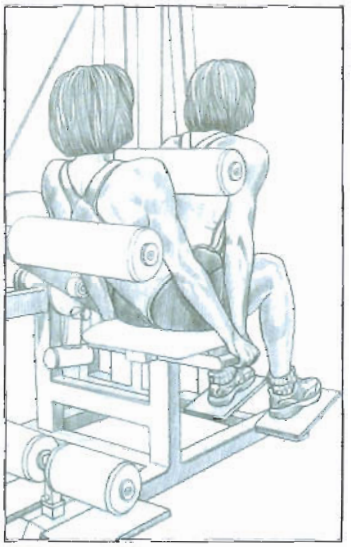
This exercise places primary emphasis on the buttocks and thigh biceps (except the thigh biceps short head) and secondary emphasis on the spinal erectors and other lower back muscles. In addition, flexing the upper body completely is excellent for stretching all the sacrospinalis muscles. Placing your pelvis on the front padded surface moves the axis of flexion forward and isolates the work on the sacrospinalis, but with less intensity because of the limited range of movement and increased leverage.



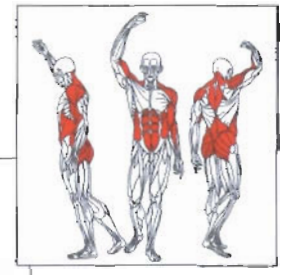
EXECUTION OF MOVEMENT

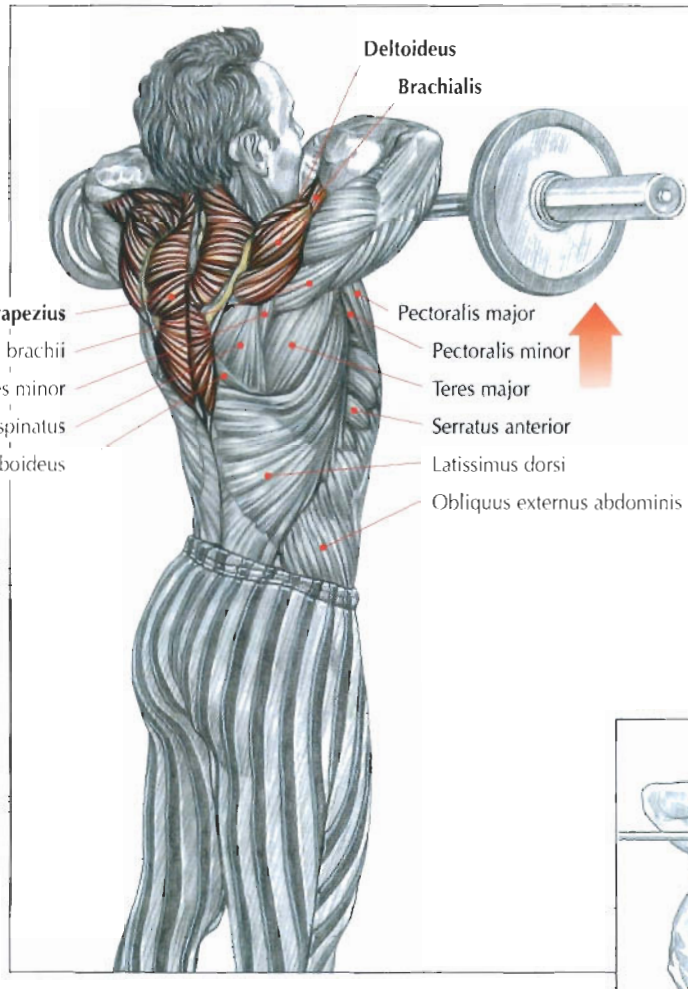
You can hold the hyperextension for a few seconds to help isolate the work.
Beginners can perform this exercise on a specific incline bench for more comfort.

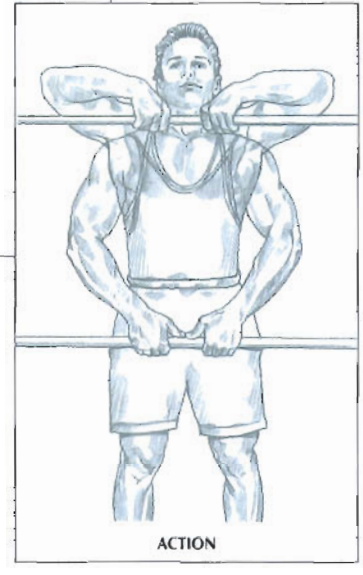
Variation: with a specific machine, you can isolate the stress on the sacrospinalis.



15 UPRIGHT ROWS

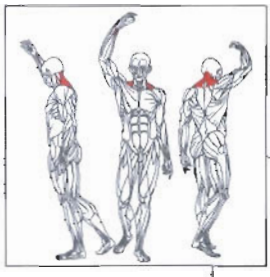




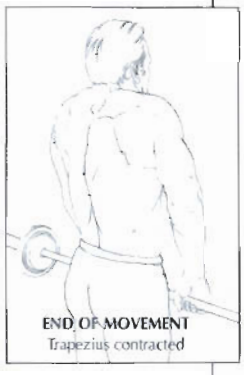


Stand with your feet slightly spread. Keep your back straight. Take an overhand grip on the bar with your hands palm-width apart or a little more:
- Inhale and pull the barbell straight upward until it contacts your chin
- Lift your elbows as high as possible at the top point of the movement
- Exhale and slowly lower the barbell back to the starting point

This exercise works the upper trapezius and medial-posterior deltoid groups most intensely. Secondary emphasis is placed on the anterior deltoids, biceps, forearm flexors, abdominals, buttocks, and sacrospinalis.
The wider your grip, the more the movement works the deltoids and the less it works the trapezius muscles.

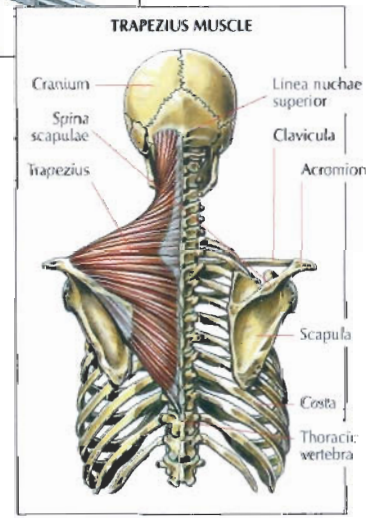


BARBELL SHRUGS 16

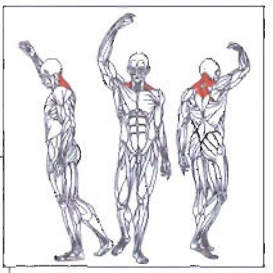


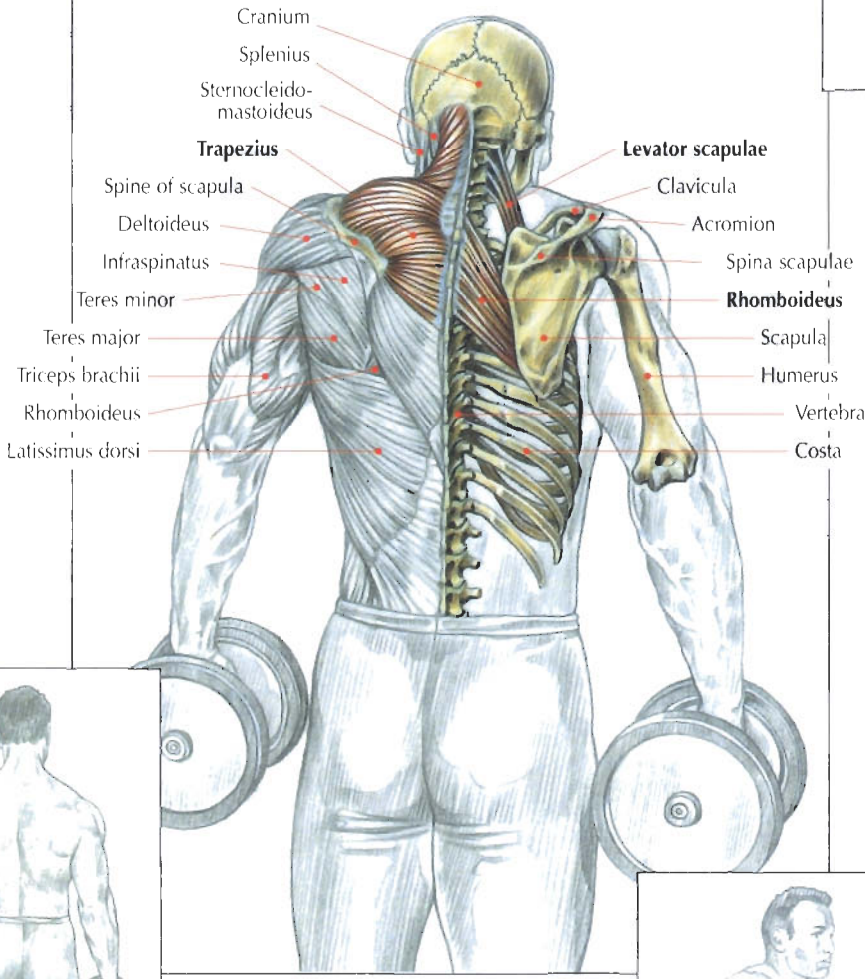
Stand with your feet slightly apart, facing the bar resting on the floor or on a weight rack:
- Take an overhand grip on the bar (or an over-under grip if the weight is heavy), with your hands a little more than shoulder-width apart
- Keeping your arms and back straight, contract your abdominals and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

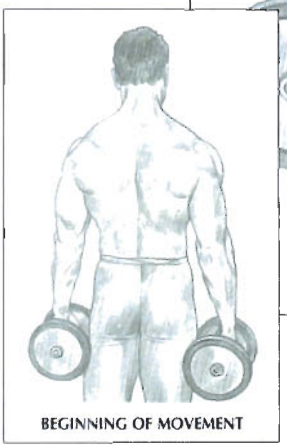
This exercise isolates the trapezius muscles. Secondary emphasis is placed on the deltoids.



17 DUMBBELL SHRUGS





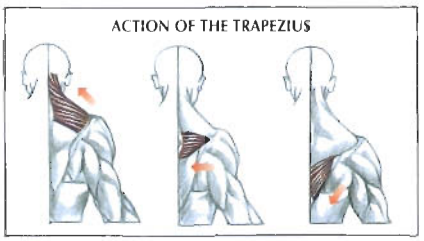


BEGINNING OF MOVEMENT

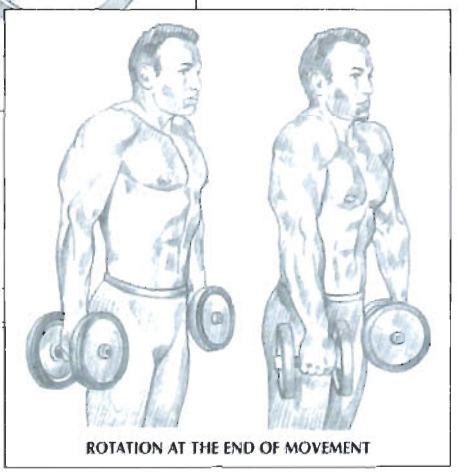
Stand with your feet slightly apart. Keep your head straight or slightly bent forward. Hold the dumbbells with your arms extended at your sides:

– 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, levator scapulae, and the rhomboids when you press your scapulae together to shrug your shoulders to the rear.

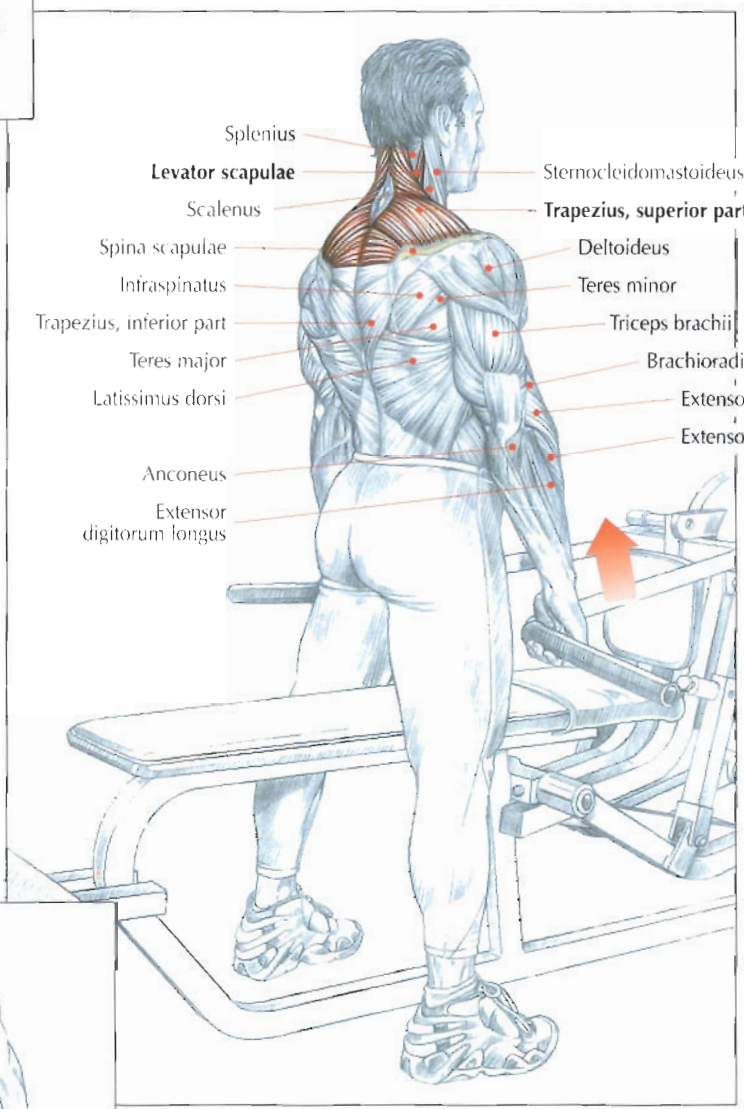


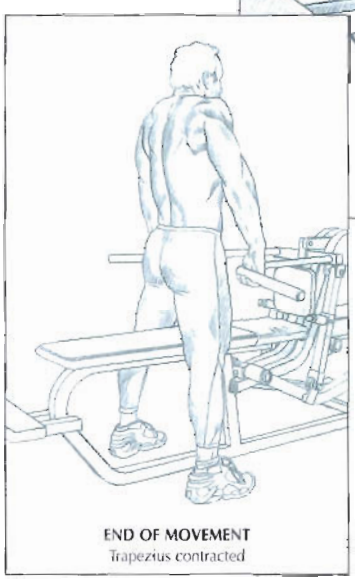
ACTION OF THE TRAPEZIUS



ROTATION AT THE END OF MOVEMENT

MACHINE SHRUGS 18





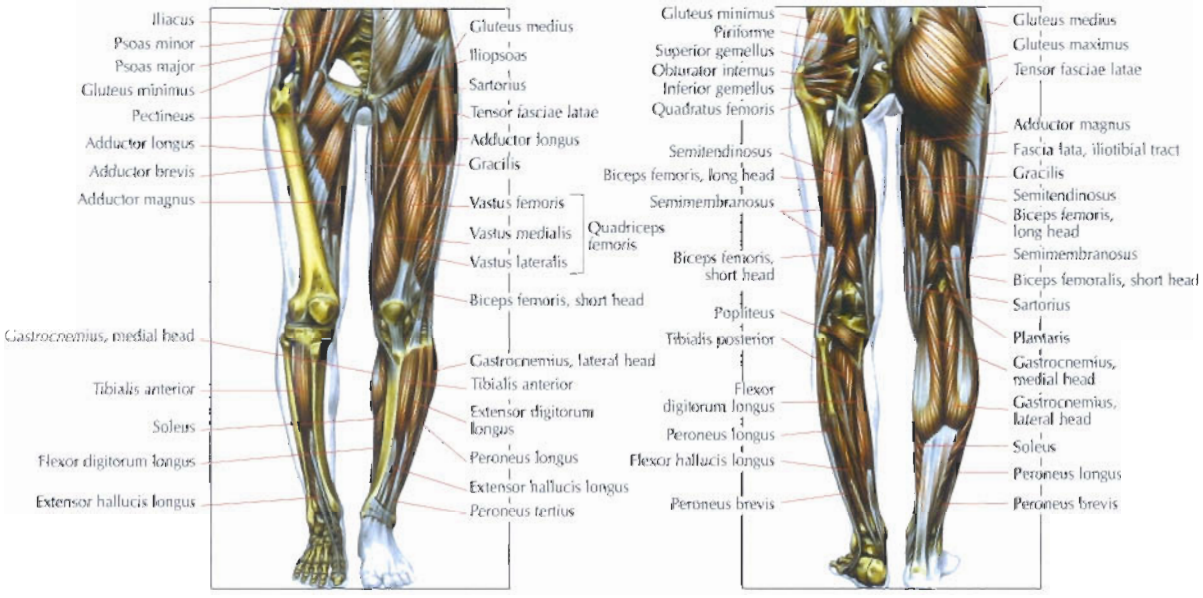
END OF MOVEMENT
Trapezius contracted

Stand facing the machine. Take an overhand grip on the bar, with your hands slightly more than shoulder-width apart or, 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

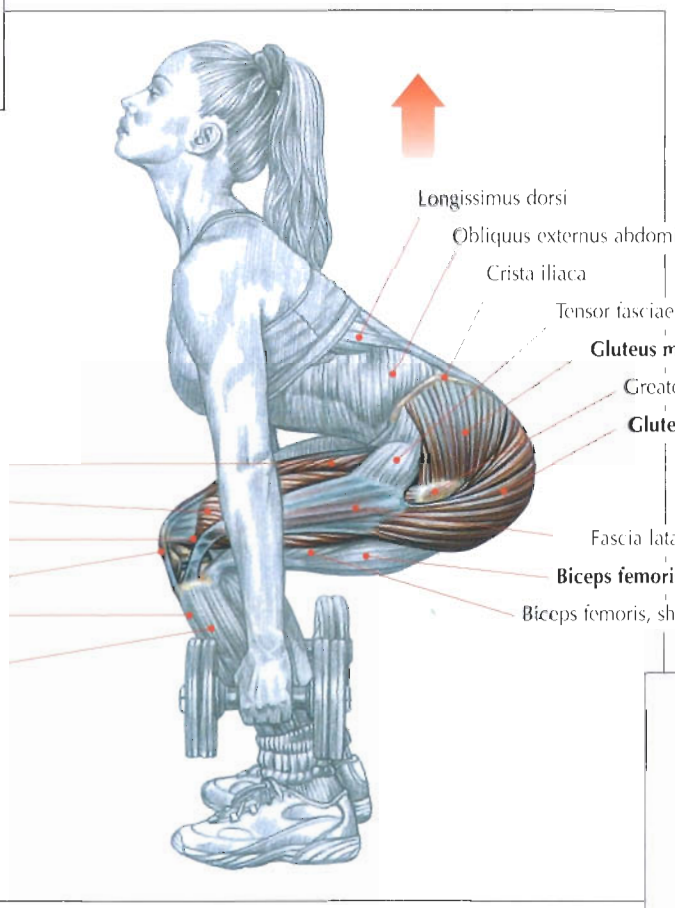
This exercise is excellent for developing the upper part ot the trapezius and the levator scapulae.

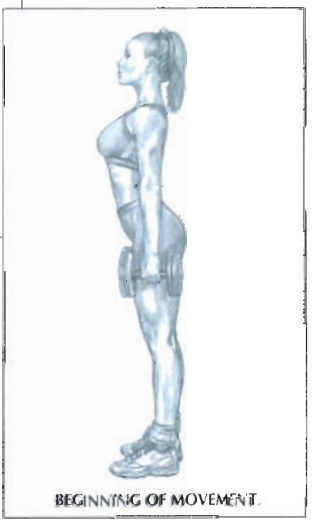
5 LEGS

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



DUMBBELL SQUATS 1

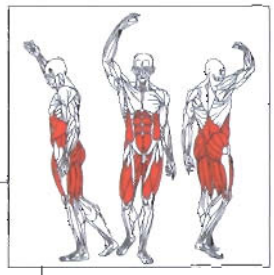




Stand with your feet slightly apart and grasp a dumbbell in each hand with your arms hanging down at your sides:
- Look straight ahead, inhale, slightly arch your back, and squat down
- Once your thighs are parallel to the floor, straighten your legs to return to the starting position
- Exhale as you complete the movement

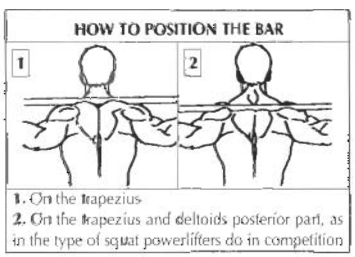
This exercise particularly works the quadriceps and gluteals.

2 SQUATS

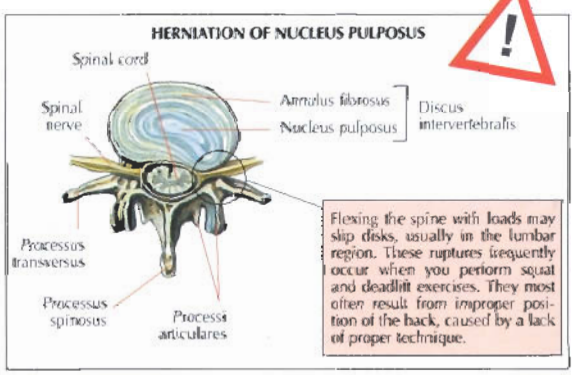


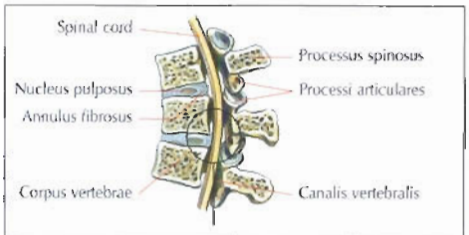
The squat is the number one bodybuilding movement because it involves a large part of the muscular system. To perform it, place a barbell on a squat rack. Duck under the bar and position it across your shoulders on the trapezius, slighly above the posterior part of the deltoids. Grasp the bar using a grip width appropriate to your body type and pull your elbows to the rear:

- Inhale deeply (to maintain intrathoracic pressure and prevent yourself from bending forward) and slightly arch your back by rotating your pelvis forward
- Look straight ahead and lift the bar off the rack
- Move back a step or two from the rack and set your feet shoulder-width apart, keeping your toes pointed forward or slightly angled outward
- Slowly bend your knees and squat down your back slighly bent forward

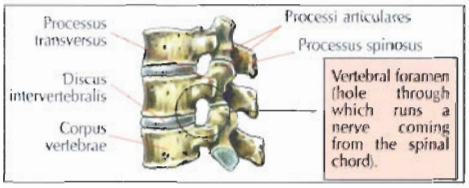


1. On the trapezius
2. On the trapezius and deltoids posterior part, as in the type of squat powerlifters do in competition





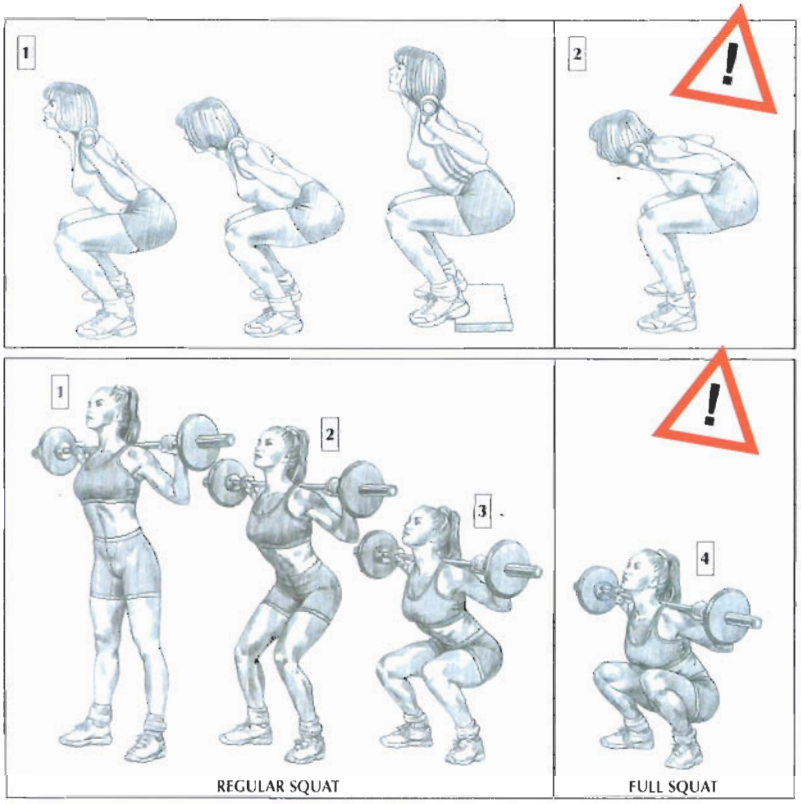
When you flex your spine, the intervertebral disks are pinched at the front and gape at the back. The fluid of the nucleus pulposus moves backward and can compress nerve elements (which causes lumbago or sciatica).



– To avoid injury, keep your back straight (the axis of flexion runs through the hip-thigh joint)
– Once your thighs are parallel to the floor, extend your legs and straighten your torso to return to the starting (upright) position
– Exhale as you complete the movement

Squats particularly work the quadriceps, gluteals, adductors, spinal erectors, abdominals, 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 so use it with caution.
(2) You can position the bar lower, across your upper deltoids, to improve your balance and increase the lifting power of your back, which allows you to use heavier weight. This technique is mostly used by powerlifters.
(3) You can do squats on a specific machine to prevent yourself from bending forward and isolate stress on the quadriceps.



1. PROPER POSITIONS:
When doing squats, always keep your back as upright as possible.
There are differences in body types (legs of different lengths, ankles more or less flexible) and different ways to execute the technique (experimenting with different foot-stance widths, using platform shoes or heelpieces, resting the barbell higher or lower on the traps). Consequently, your torso will be more or less inclined, but be sure to bend forward at thight joint.

2. IMPROPER POSITION:
Never flex the spine while doing squats. This error contributes to most low back injuries, especially slipped disks.

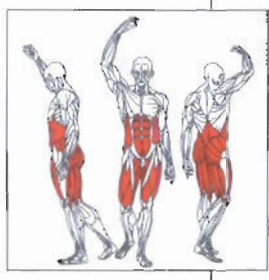
In order to correctly feel the action of the gluteals, it is important to bend your knees until your thighs are parallel to the floor.

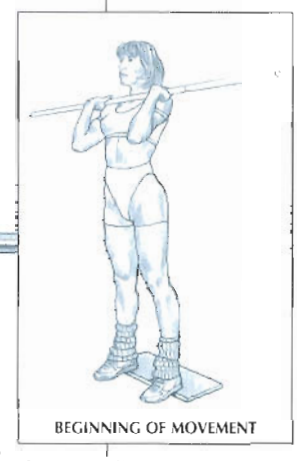
1–3: NEGATIVE PHASE OF REGULAR SQUAT

4. FULL SQUAT:
To place more emphasis on the gluteals, you can bring your thighs into a position below the horizontal. However, use this technique only if you have flexible ankles or short thigh bones. In addition, do the full squat carefully because it tends to flex the spine, which can lead to serious injuries.

In any movement, whenever you use heavy weight, you must "**block**."
1. Stick out your chest by taking a deep breath and filling 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, contract 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 (or flexing the spine), which will cause a slipped disk if you work with heavy weight.

3 FRONT SQUATS





BEGINNING OF MOVEMENT

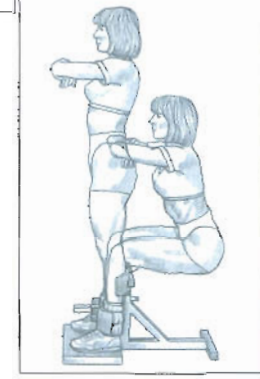
Latissimus dorsi
Obliquus externus abdominis
Pectineus
Sartorius
Adductor longus
Gracilis
Quadriceps femoris
Rectus femoris
Vastus medialis
Vastus lateralis
Vastus intermedius
Gluteus medius
Tensor fasciae latae
Greater trochanter
Gluteus maximus
Fascia lata
Biceps femoris, long head
Biceps femoris, short head
Gastrocnemius, lateral head
Soleus
Extensor digitorum longus
Gastrocnemius, medial head
Patella
Peroneus longus
Tibialis anterior

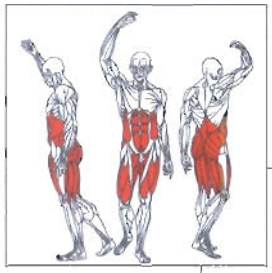
CROSSED ARMS VARIATION

Position the barbell across your anterior deltoids, hold your upper arms parallel to the floor, bend your elbows, cross your forearms, grasp the bar, and look straight ahead:
– Inhale and squat down
– Return to the starting point, exhale as you complete the movement

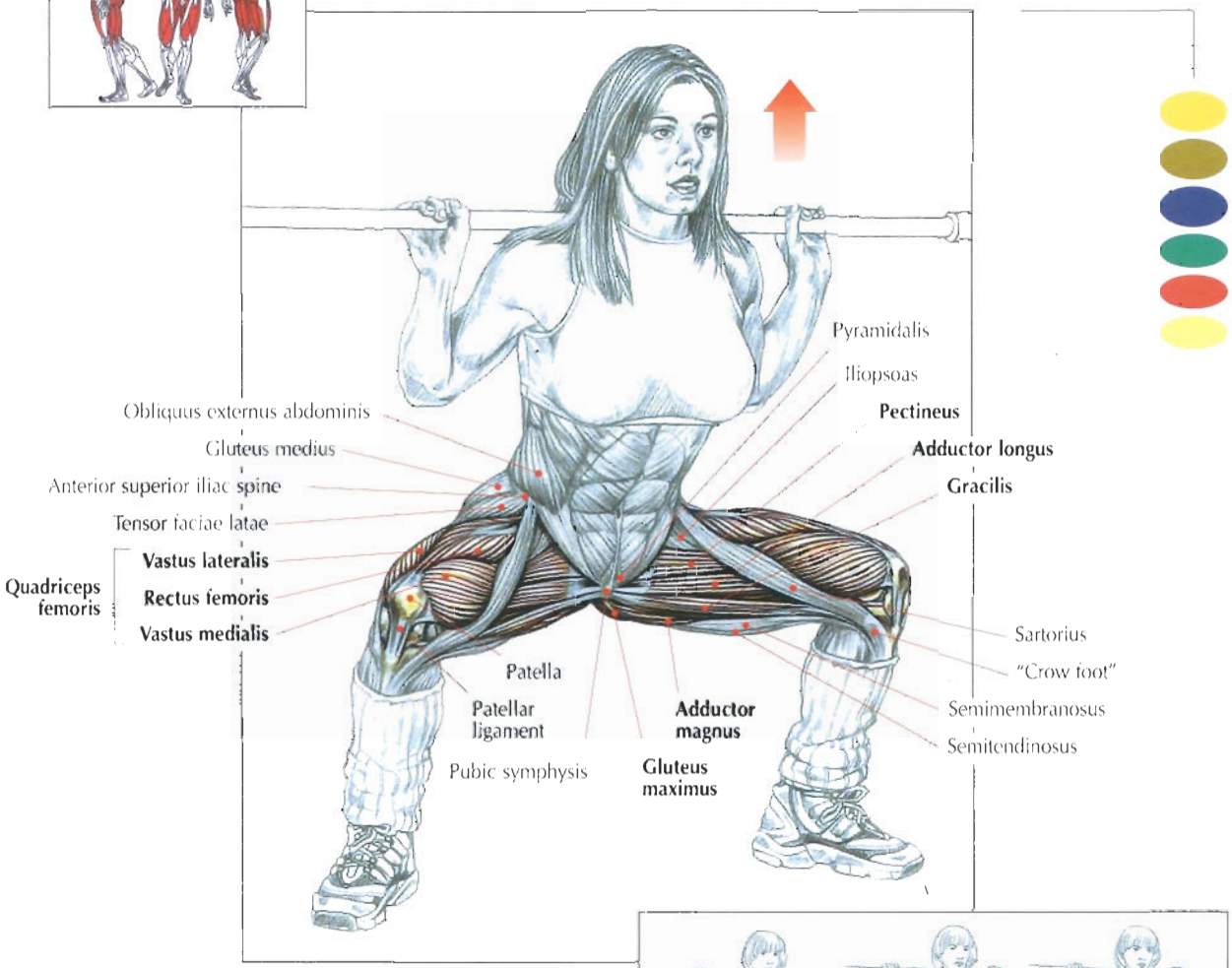
While doing front squats, you must not bend forward, but keep your back perfectly straight. You can rest your heels on a block of wood to improve your balance, but doing so might move your knees too far forward for safe lifting.
This type of squat places primary emphasis on the quadriceps. Always use lighter weights than in the conventional squat. This good all-around exercise also works the gluteals, hamstrings, abdominals, and the spinal erectors.
Weightlifters often use this movement because it works the thigh muscles exactly the same way as when doing cleans or finishing snatches.

As with front squats, you place primary emphasis on the quadriceps if you wedge your legs on a specific machine.

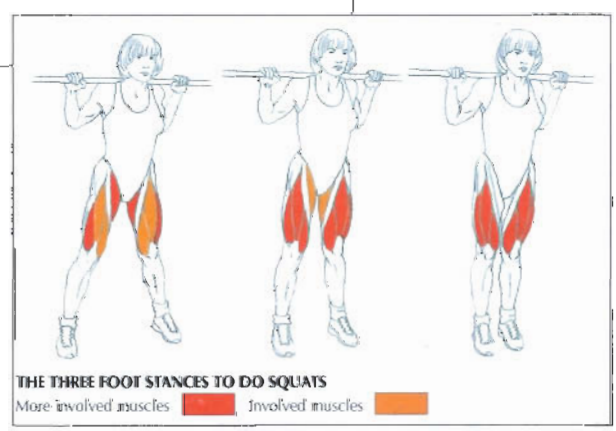




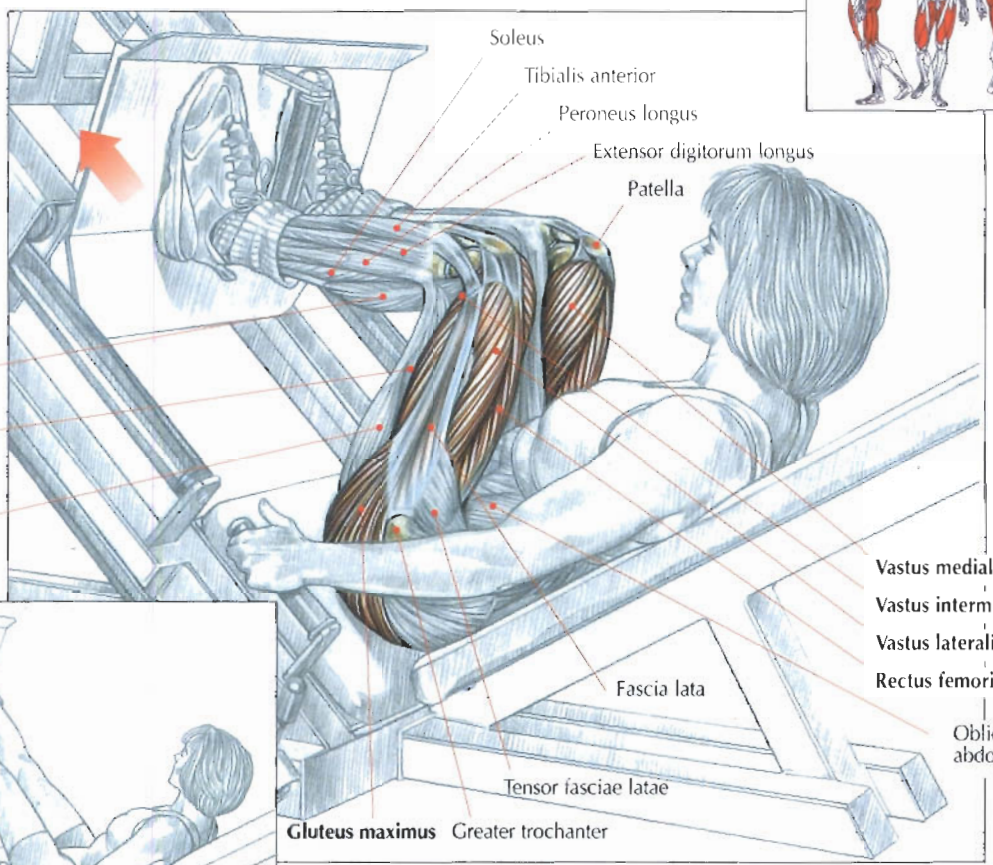
POWER SQUATS 4

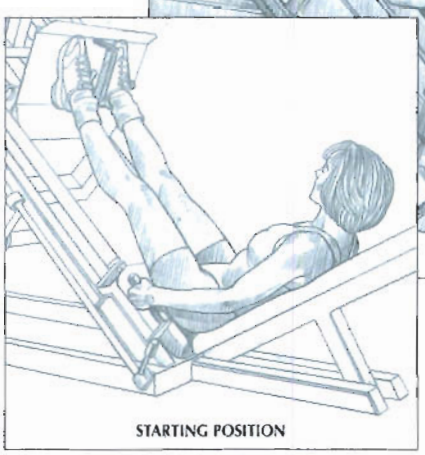


This movement is the same as conventional squats, but your legs are widely spread with your toes pointed outward, which specifically works the inner thighs.
The muscles involved are
– the quadriceps,
– all the adductors (adductor longus, adductor magnus, adductor brevis, pectineus and gracilis),
– the gluteals,
– the hamstring group, and
– all the sacrospinalis muscles.



5 ANGLED LEG PRESS

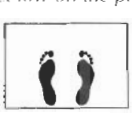
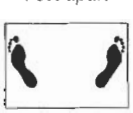
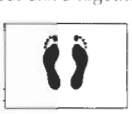




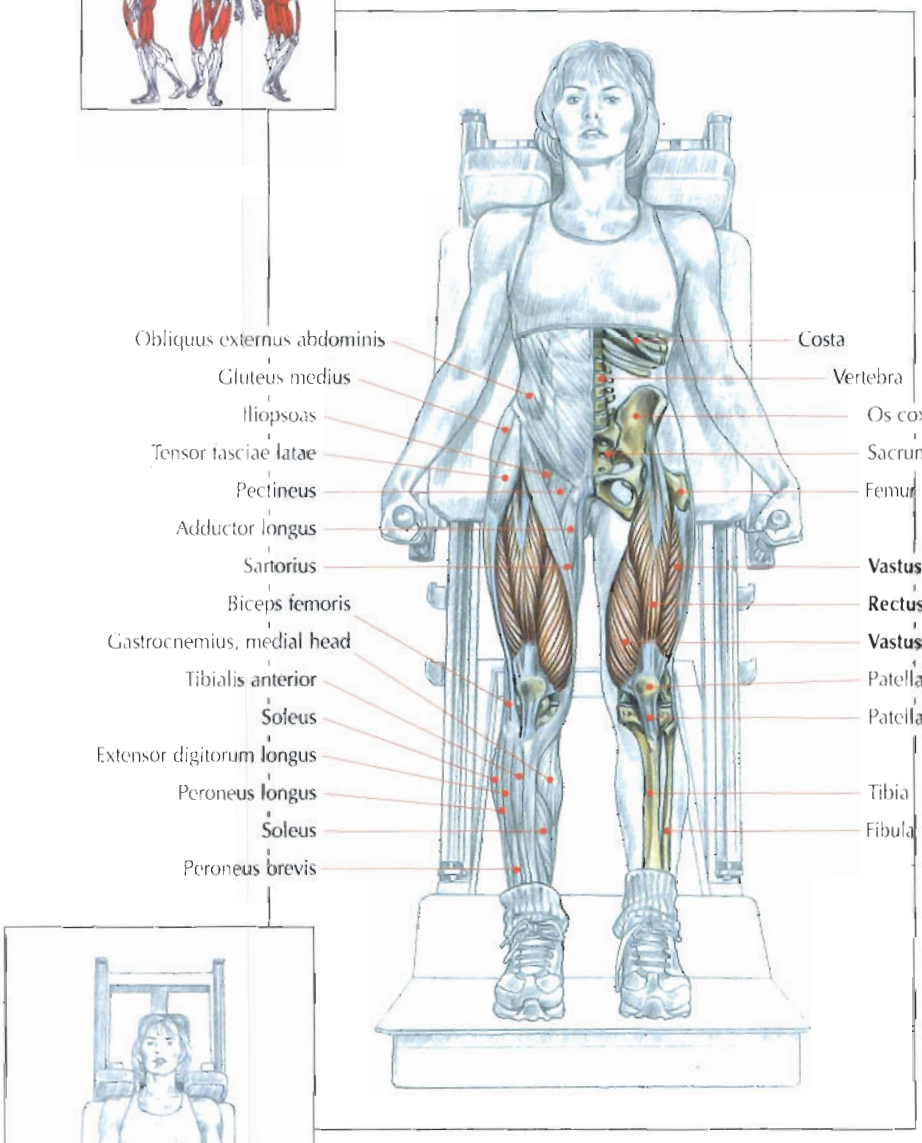
Warning: using the leg press with heavy weight may cause a displacement in the sacroiliac joint, which can lead to contracture.

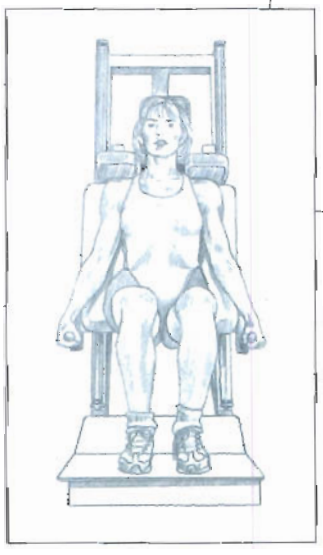
Sit on the machine, lying back against the angled back pad, and place your feet about shoulder-width apart:
- Inhale, rotate the stop bars at the sides of your hips to release the carriage for your set
- Bend your legs as much as possible while making sure your knees travel to the sides of your chest
- Return to the starting position, exhaling as you complete the movement

If you place your feet lower on the footplate, you will primarily stress your quadriceps. Conversely, if you place your feet on the top of the footplate, 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	*Feet low on the plate*	*Feet apart*	*Feet close together*
			
Primary emphasis on the gluteals and hamstrings	**Primary emphasis on the quadriceps**	**Primary emphasis on the adductors**	**Primary emphasis on the quadriceps**

HACK SQUATS 6

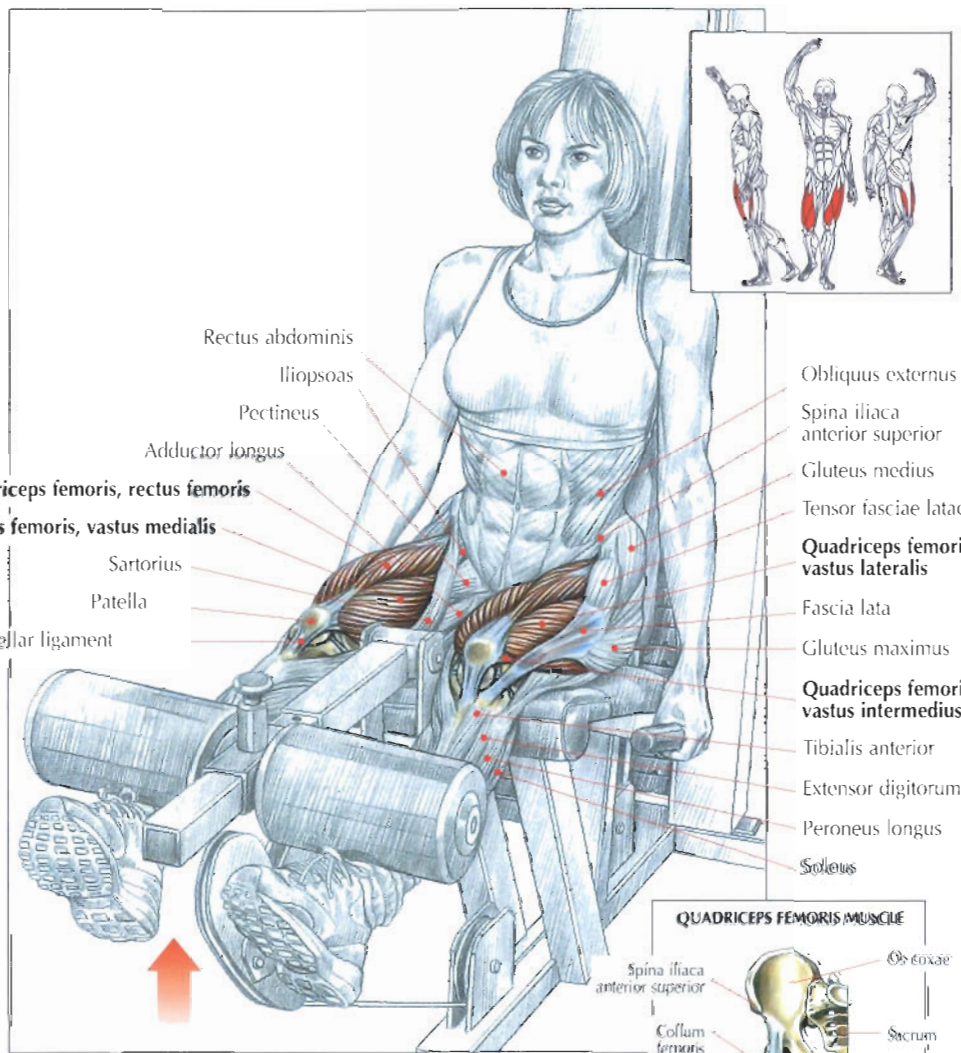


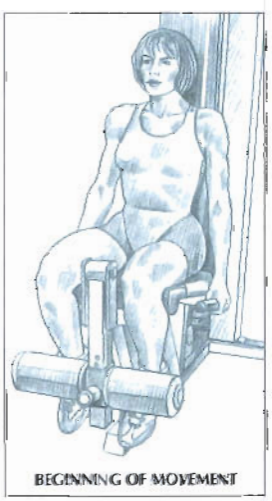


Flex your knees, place your back against the padded surface, wedge your shoulders beneath the yokes attached to the machine, and place your feet fairly close together:
– Inhale, rotate the stop handles at the sides of the yokes to release the machine, and bend your legs
– Return to the starting position, exhaling as you complete the movement

This movement maximizes emphasis on the quadriceps. If you place your feet close together, you will place more emphasis on the gluteals. If you spread your feet, you will shift the work to the adductors. To protect your back from injury, be sure to contract your abdominals in order to avoid swinging your pelvis and spine.

7 LEG EXTENSIONS

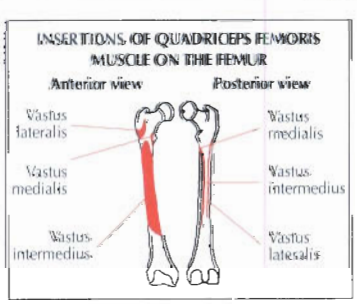


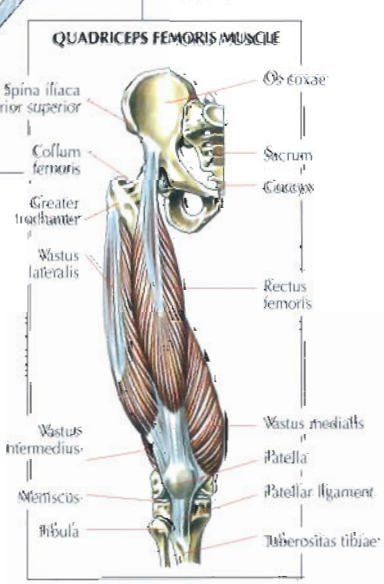

BEGINNING OF MOVEMENT

Sit on the machine. Grasp either the handles or the edges of the seating platform to steady your body throughout the movement. Bend your knees and place your ankles under the set of roller pads:

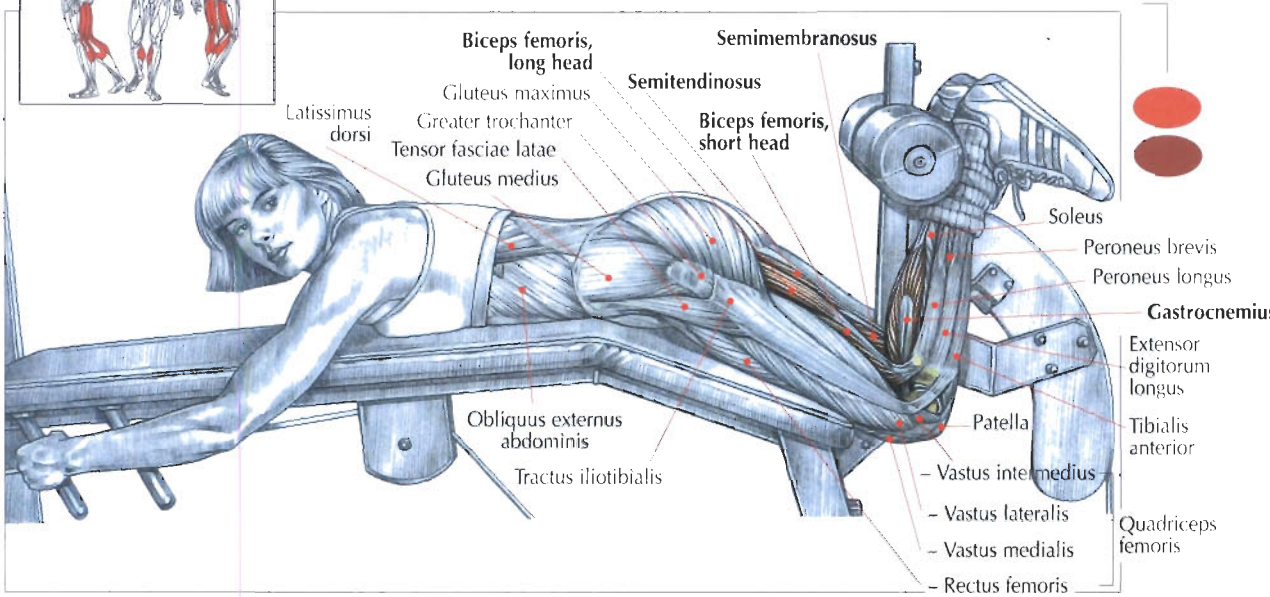
– Inhale and raise your legs until they are almost parallel to the floor
– Exhale as you complete the movement

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.





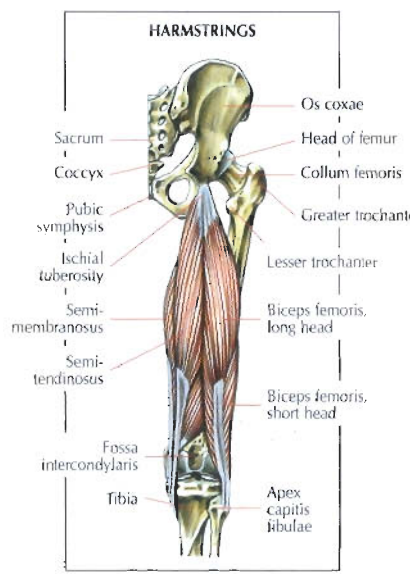
LYING LEG CURLS 8

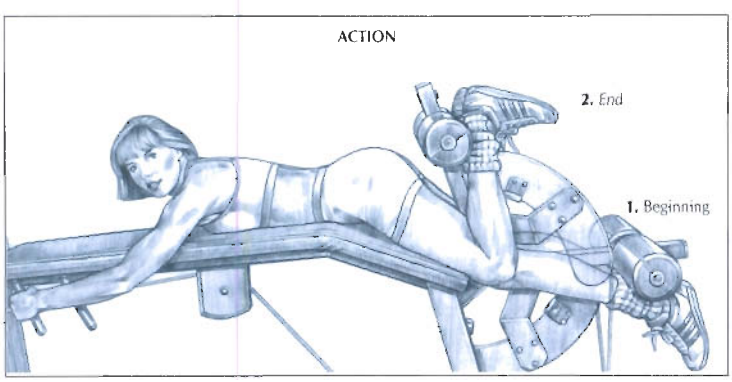


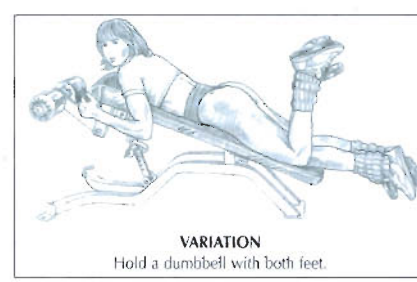
Lie facedown on the padded surface of the machine. Grasp the handles, straighten your knees and hook your feet under the set of roller pads:
- Inhale and simultaneously raise your feet upward until your knees are as fully bent as possible (try to touch your buttocks with your heels)
- Exhale as you complete 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 hamstrings or gastrocnemius is easy:
- feet extended puts more stress on the hamstrings
- feet dorsiflexed puts more stress on the gastrocnemius

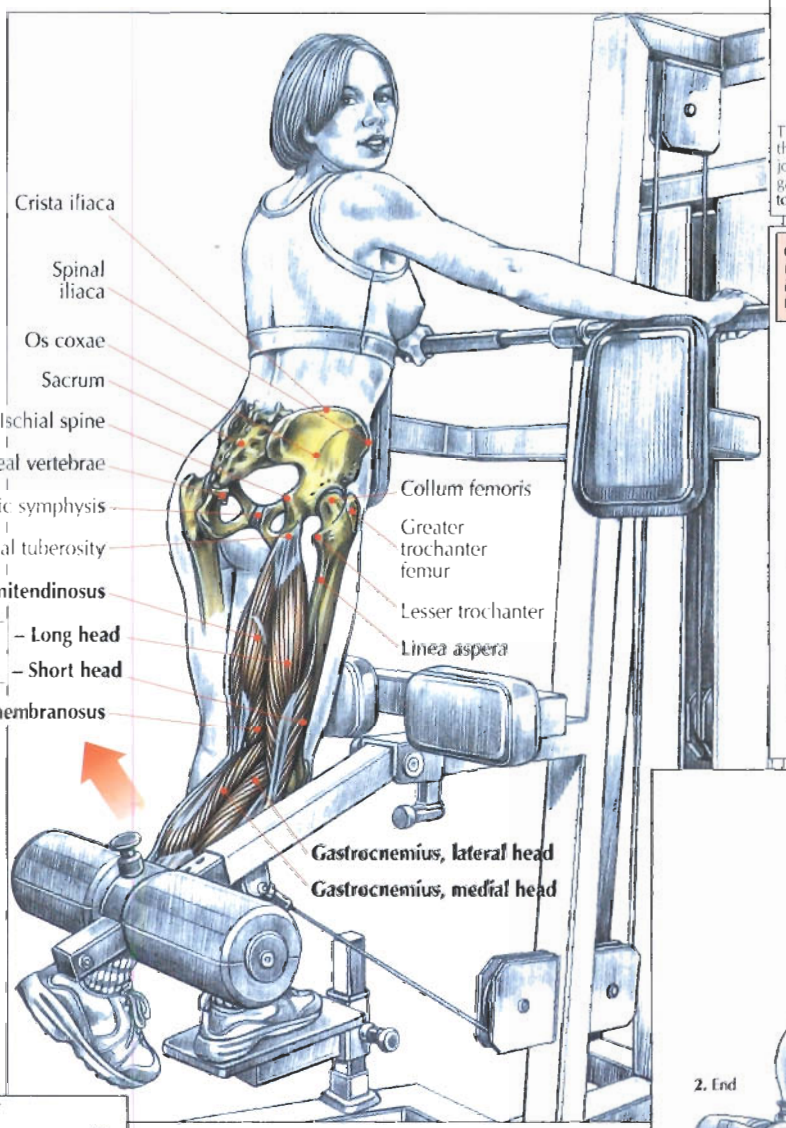
Variation: you can perform this exercise with one leg at a time or by holding a barbell with both feet.



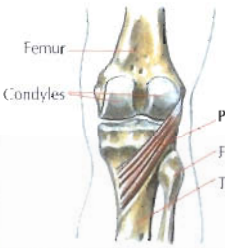




9 STANDING LEG CURLS

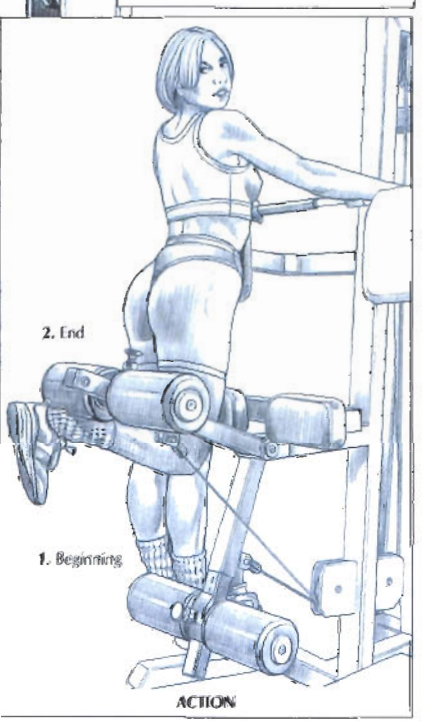


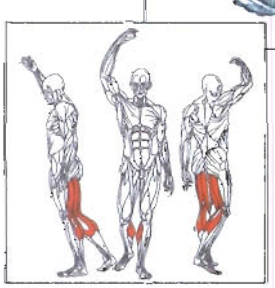
POPLITEUS MUSCLE



The popliteus muscle is situated deeply in the back of the leg at the level of the knee joint. It is involved with the hamstrings and gastrocnemius in bending the lower leg toward the thigh.

Of all flexor muscles of the thigh, only the short head of biceps femoris muscle is monoarticular. This part exclusively flexes the leg.

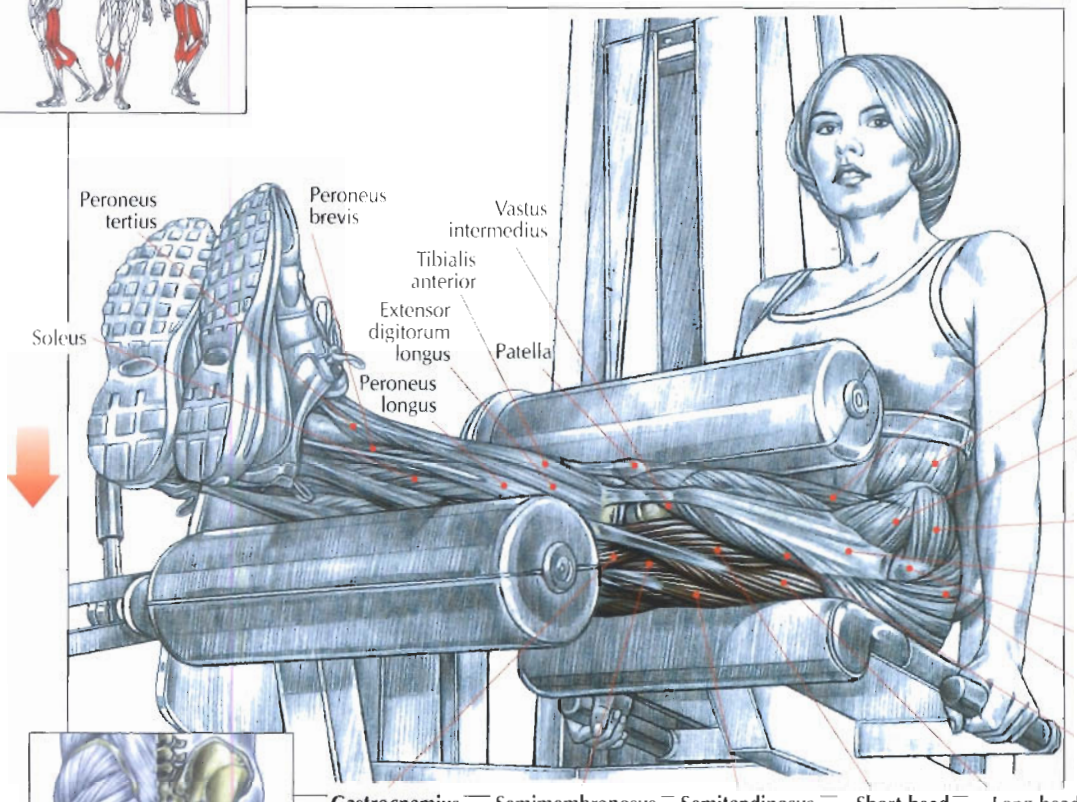


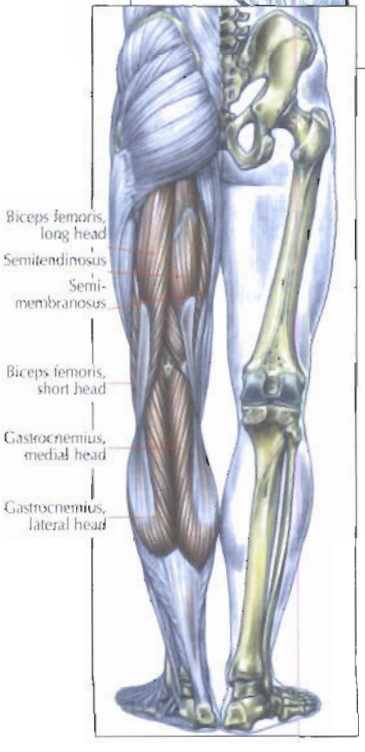


Stand in the machine so your knee is pressed against the movable pad. Hook your ankle under the roller pad, straighten your leg, and grasp the machine to restrain your upper body as you do the movement:
– Inhale and bend your knee
– Exhale as you complete the movement

This exercise involves all the muscles of the hamstring group (semitendinosus, semimembranosus, biceps femoris short and long heads) and, to a lesser extent, the gastrocnemius. To increase the emphasis on the gastrocnemius, simply dorsiflex your ankle while curling the roller pad. To decrease the work on the gastrocnemius, which is the intent in most cases, simply extend your feet.

SEATED LEG CURLS 10

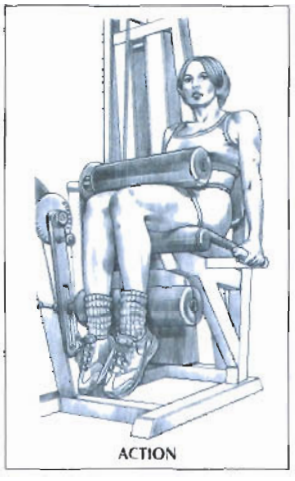




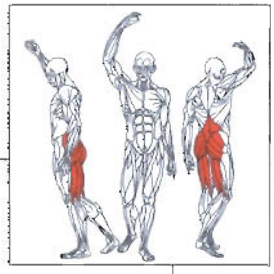
In the hamstring group, only the biceps femoris short head is monoarticular. It exclusively flexes the leg.

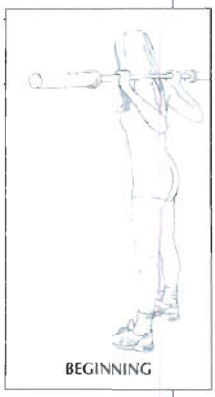
Sit on the machine with your legs straight, ankles resting on the roller pad. Lower the leg restraint over your thighs to secure them. Grasp the handles provided on each side:
– Inhale and bend your knees to move the roller pad downward
– Exhale as you complete the movement

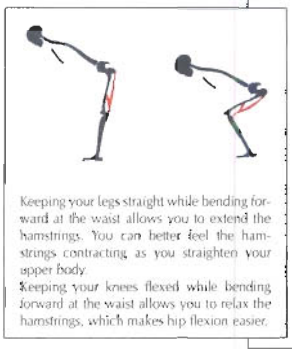
This exercise works the hamstring group and, to a lesser extent, the gastrocnemius.



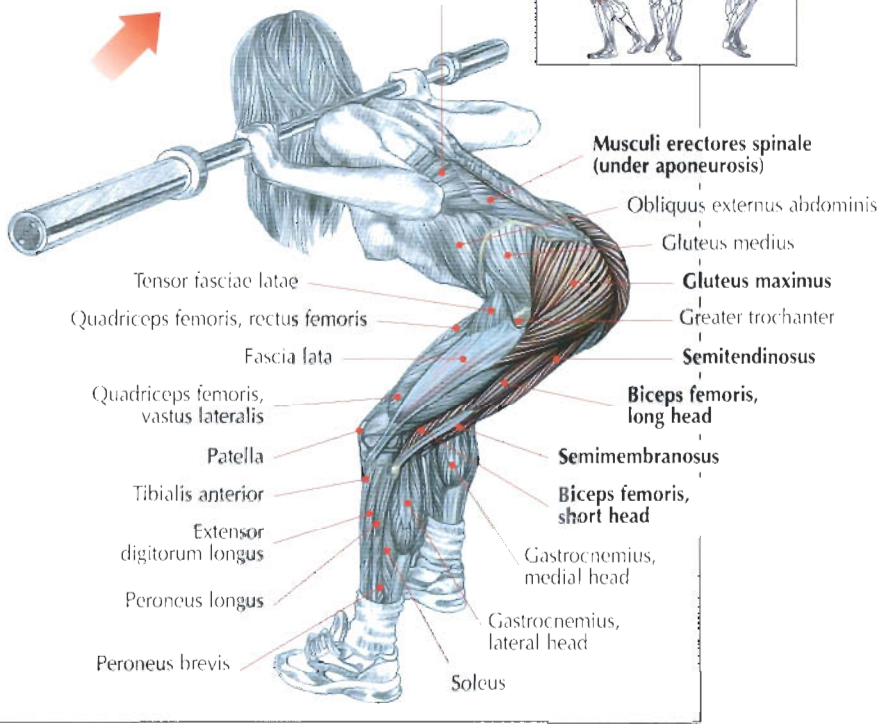
11 GOOD MORNINGS

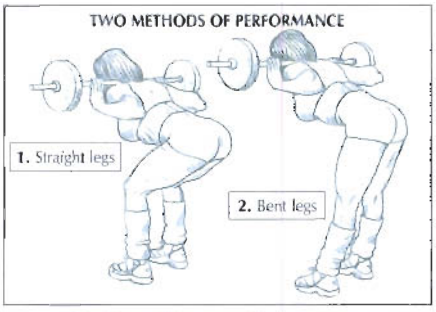


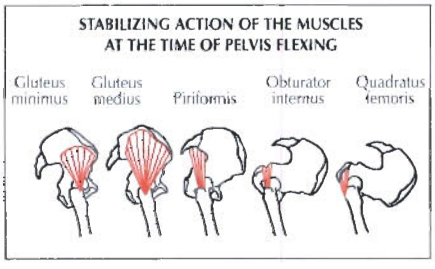




Keeping your legs straight while bending forward at the waist allows you to extend the hamstrings. You can better feel the hamstrings contracting as you straighten your upper body.
Keeping your knees flexed while bending forward at the waist allows you to relax the hamstrings, which makes hip flexion easier.

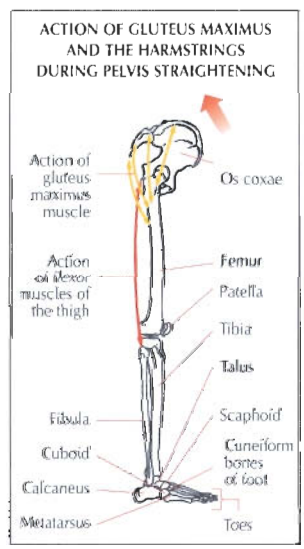




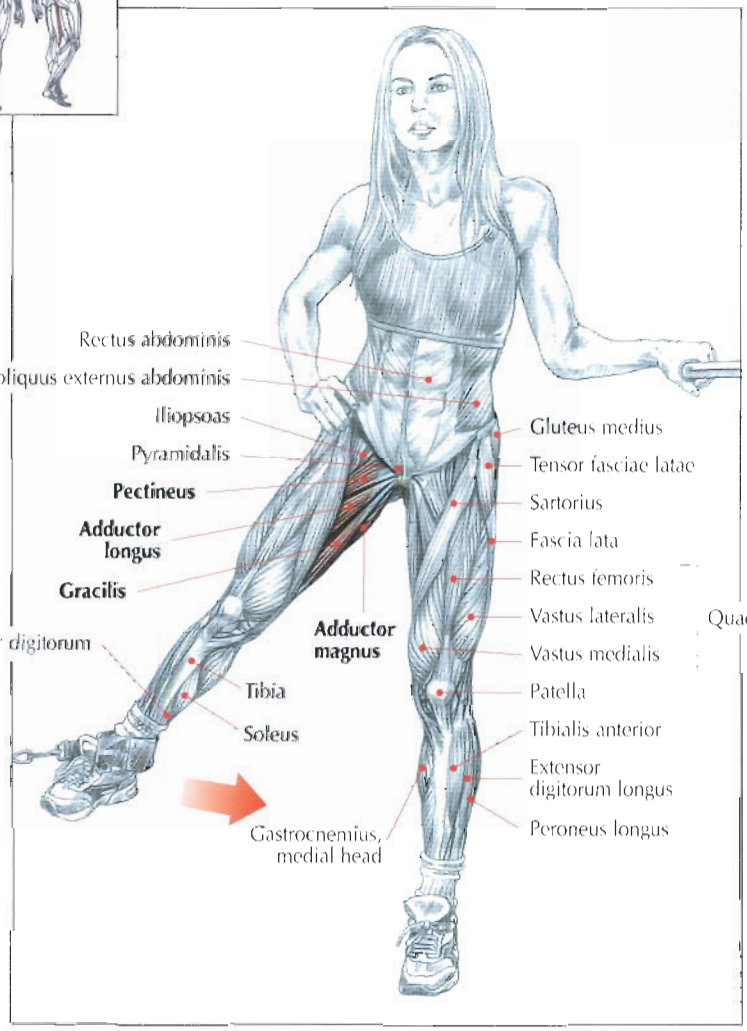


Stand with your feet slightly apart. Place a barbell across your trapezius muscles or a little lower across your posterior deltoids:
– Inhale and bend forward at the waist until your torso is roughly parallel to the floor, being sure to keep your back straight
– Return to the starting position, exhaling

To make the movement easier, you can slightly bend your knees. This exercise involves the gluteals and spinal erectors, and particularly the hamstrings (except the biceps femoris short head, which only flexes the leg). Besides flexing the knee, the main function of the hamstrings is tilting the pelvis backward, straightening the upper body if the latest interact to contract the abdominals and sacrospinalis isometrically.
To get better construction in the hamstrings, never 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 reduce the likelihood of injury when doing heavy squats.
This exercise does pose a high risk to the lumbar spine, so perform it with caution.



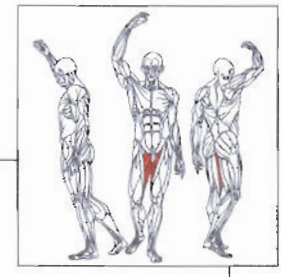
CABLE ADDUCTIONS 12

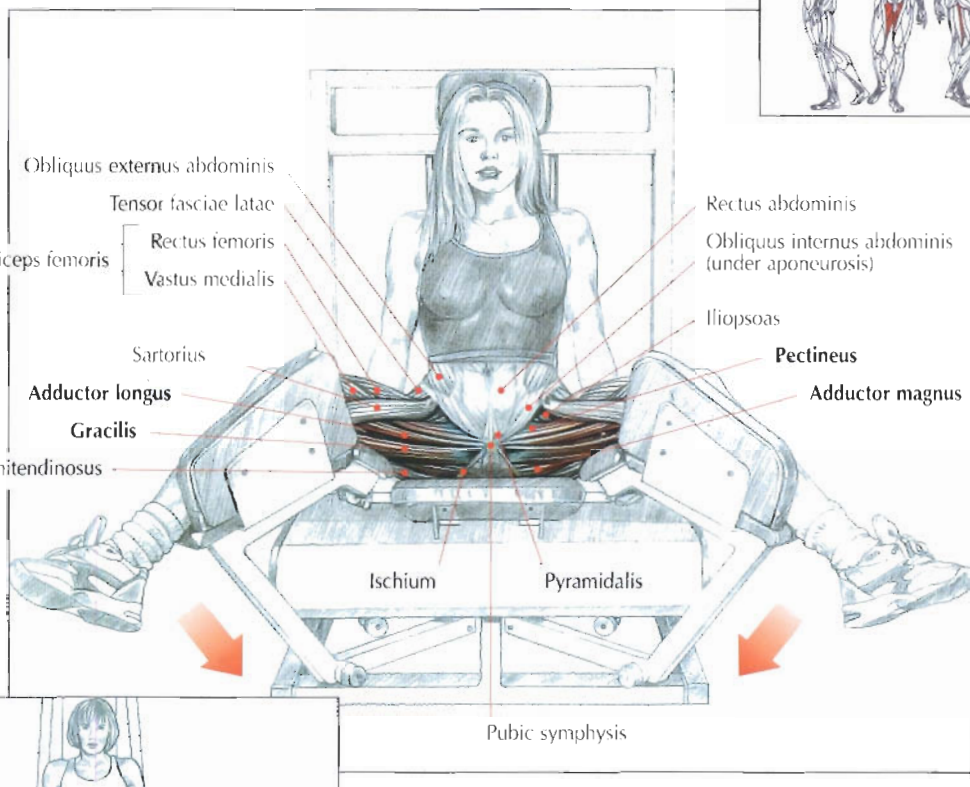


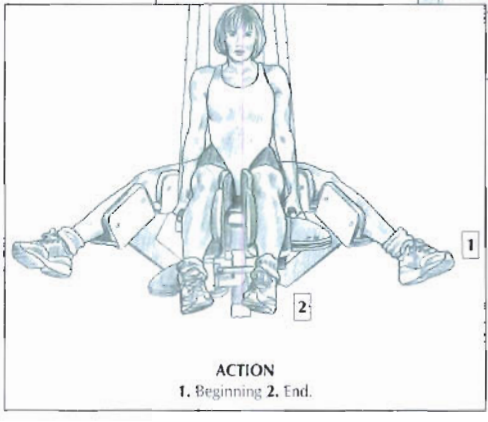
Fasten the cuff to your ankle and grasp a fixed part of the machine with your opposite hand for support:
- Bring your leg attached to the cable toward and then across the other leg
- Return to the starting position

This exercise involves all the adductors (pectineus, adductor longus, adductor magnus and gracilis). It is an excellent movement for building the inner thighs.

13 MACHINE ADDUCTIONS





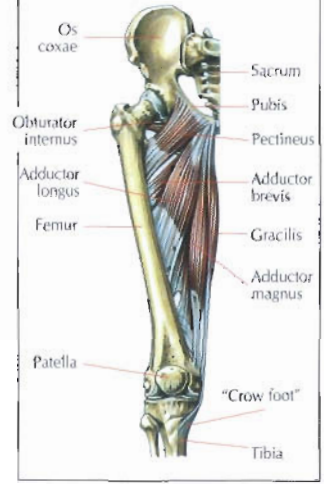


ACTION
1. Beginning **2.** End.

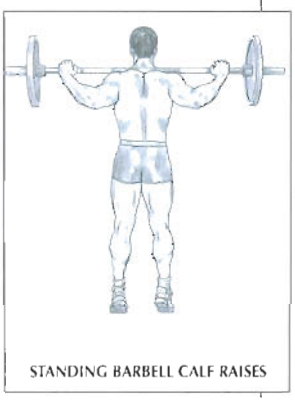
Sit on the machine with your legs spread:
– Force your thighs together
– Slowly return to the starting position

This exercise works the adductors (pectineus, 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.

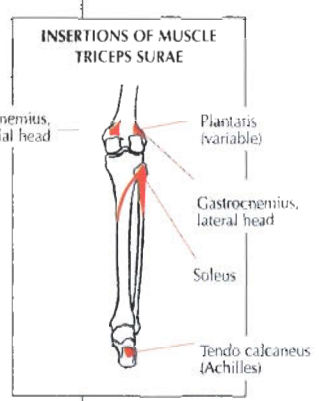
ADDUCTOR MUSCLES OF THIGH

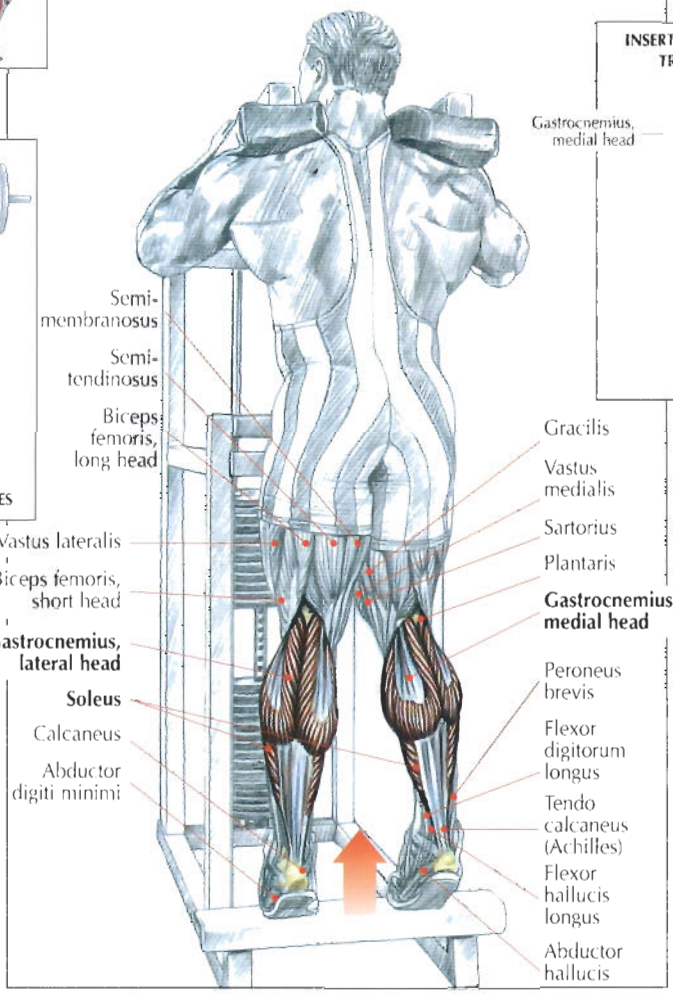


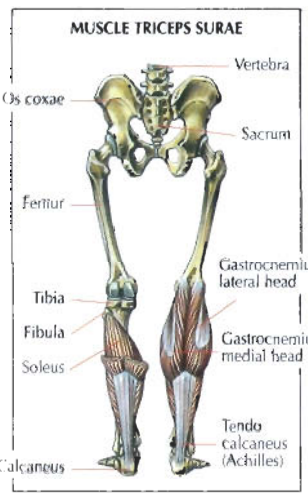
STANDING CALF RAISES 14



STANDING BARBELL CALF RAISES



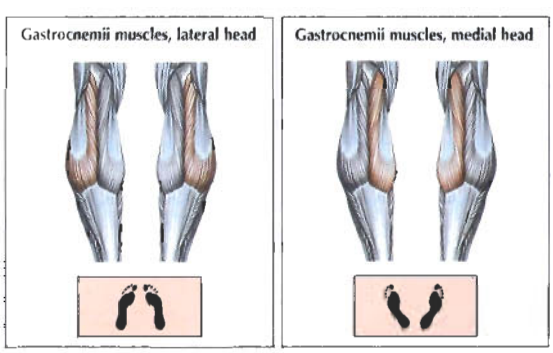




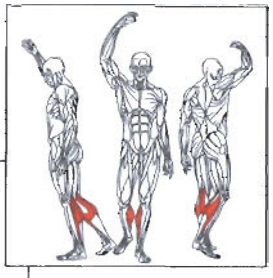
Stand with your back straight. Place your shoulders under the pads of the yoke. Place your toes and the balls of your feet on the toe block and lower your heels (dorsiflexion):
- Rise up as high as you can on your toes (plantarflexion) while keeping your knees extended
- Return to the starting position

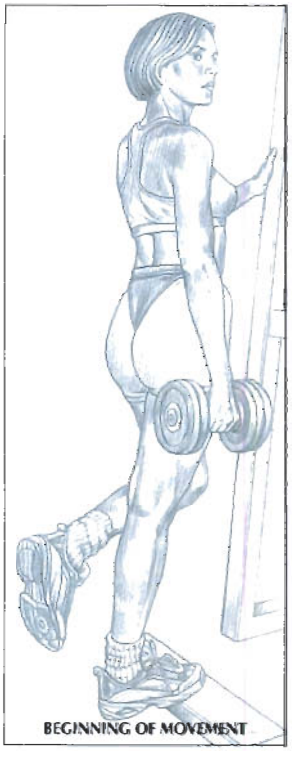
This exercise works the triceps surae (composed of the soleus and gastrocnemius, lateral and medial heads). To stretch your muscles correctly, be sure to rise up as high as possible on your toes as you perform every repetition. In theory, it is possible to isolate the stress on the gastrocnemius medial head (toes out) or on the gastrocnemius lateral head (toes in), 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.

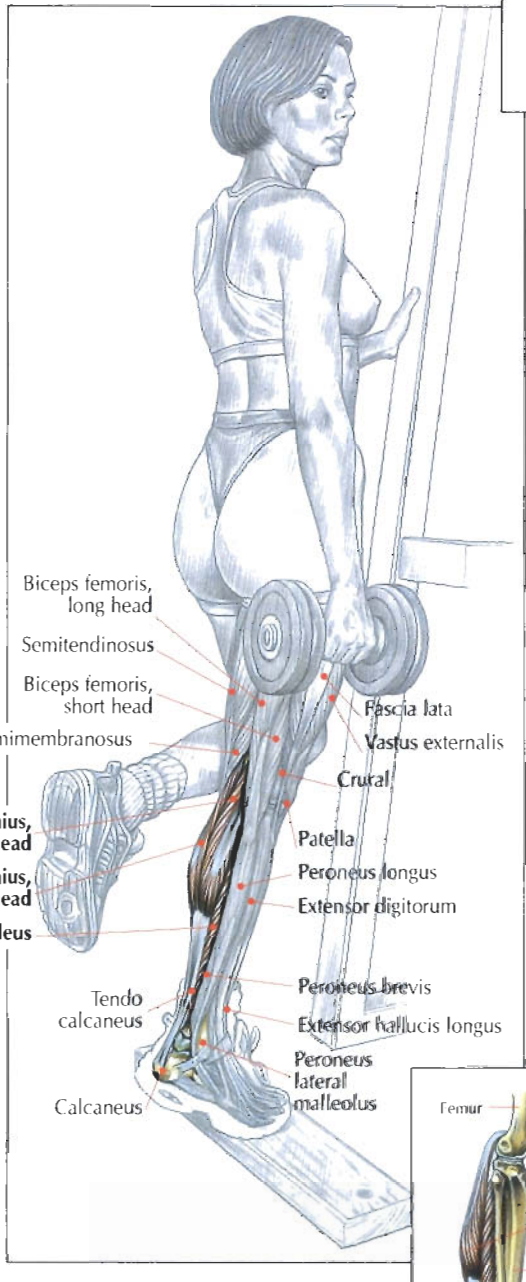
Variation: you may also do this exercise at the Smith-machine, using a block or plates under your toes for greater range of motion. You may also place a bar on your shoulders, without the block, but thus, with a lesser range of motion.

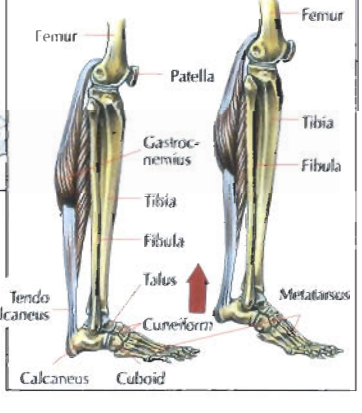


15 ONE-LEG TOE RAISES









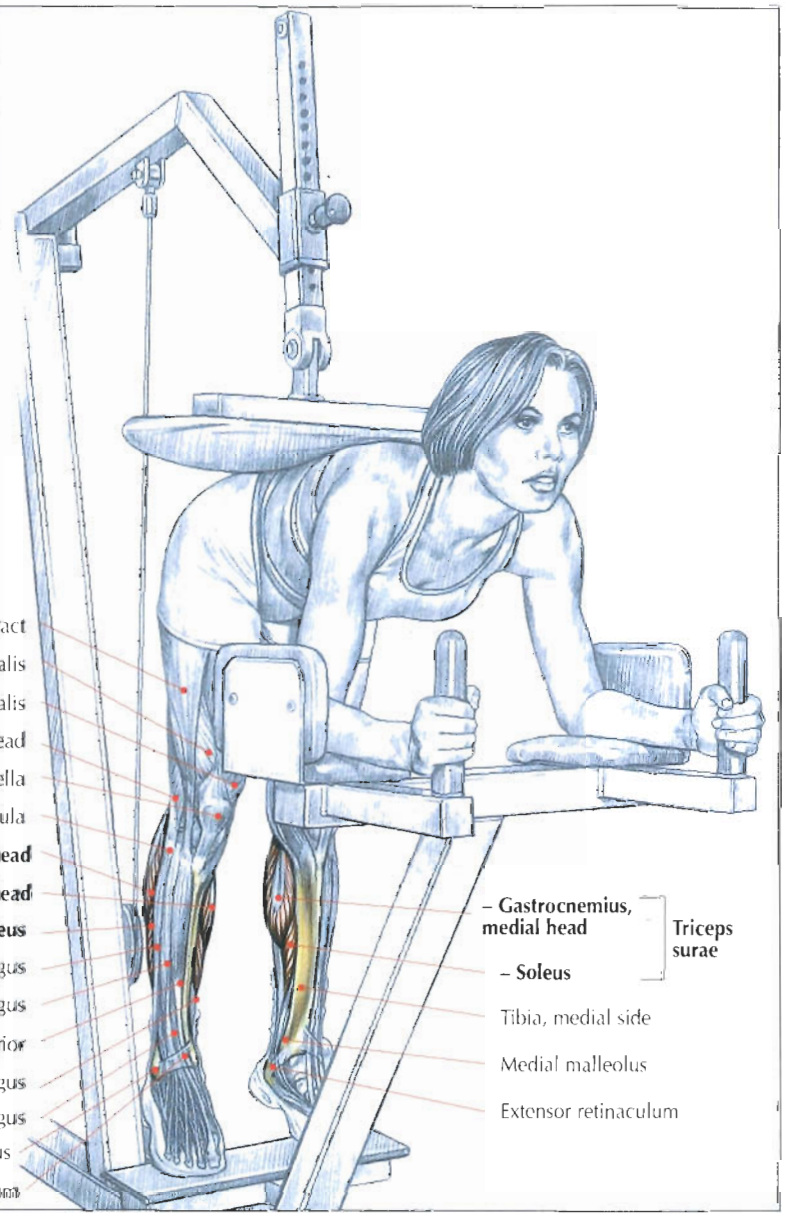
Stand on one foot, placing the toes and ball of your foot on the toe block. Hold a dumbell in your hand on the same side as the foot you are standing on and grasp the edge of machine with your other hand to steady your body in position throughout the movement.

– Rise up as high as you can on your toes (plantarflexion), keeping your knee extented 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.

DONKEY CALF RAISES 16

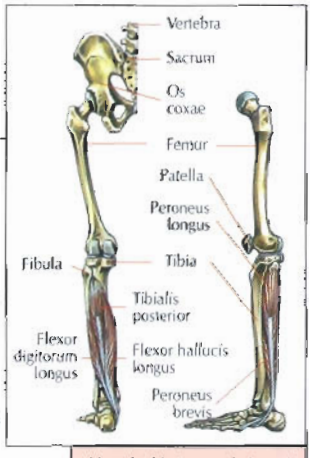


Place your toes and the balls of your feet on the footplate, straighten your legs, and lean over so your torso is parallel to the floor. Rest your forearms on the front support and press your pelvis against the padded surface of the machine:
- Drop your heels as far below your toes as possible (dorsiflexion)
- Rise up as high as you can on your toes until your calves are fully flexed (plantarflexion)

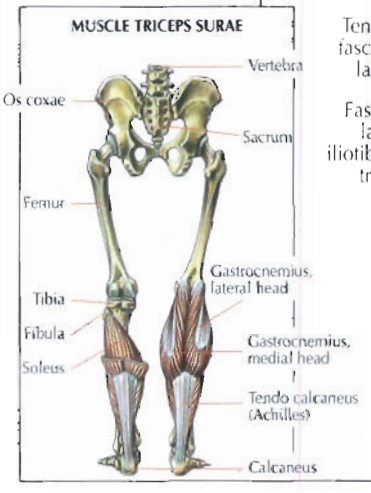
This exercise works the triceps surae. With the knee flexed, it emphasizes the soleus.

Variation: you can also arrange a toe block close enough to a flat exercise bench so you can place your toes on the block, lean over having your torso parallel to the floor, and rest your forearms on the bench. For resistance, have a training partner climb up astride your hips as if riding a horse.

17 SEATED CALF RAISES



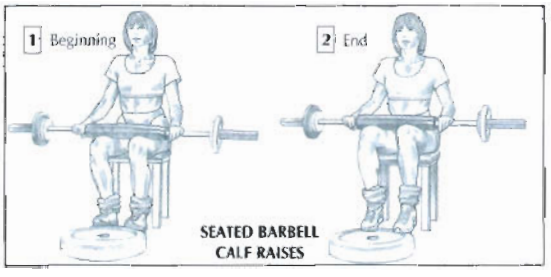
Although this is not their main function, these muscles are involved in extending the foot.



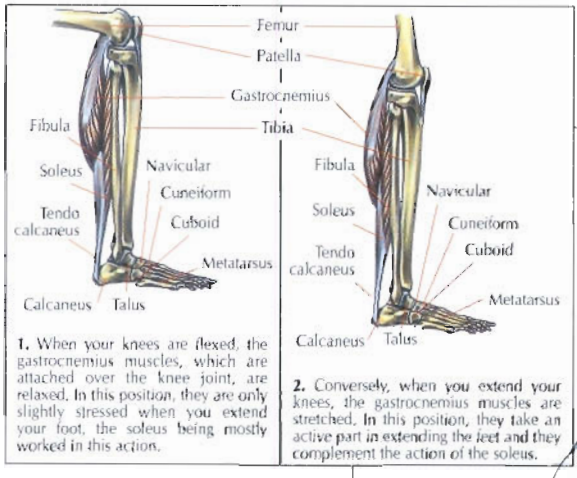
Sit on the machine's seat and place the restraint pads tightly across your thighs. Place your toes and the balls of your feet on the foot bar:
– Stretch your heels as far below the level of your toes as possible (dorsiflexion)
– Rise up as high as you can under resistance on your toes (plantarflexion)

This exercise places primary emphasis on 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 ankle).
Bending your legs relaxes the gastrocnemius. Therefore, the gastrocnemius is only slightly stressed when you extend your foot.

Variation: sit on a bench with your toes and the balls of your feet on a toe block. Pad the middle of a barbell handle (by rolling a towel around it) and rest the barbell across your knees to simulate this movement.

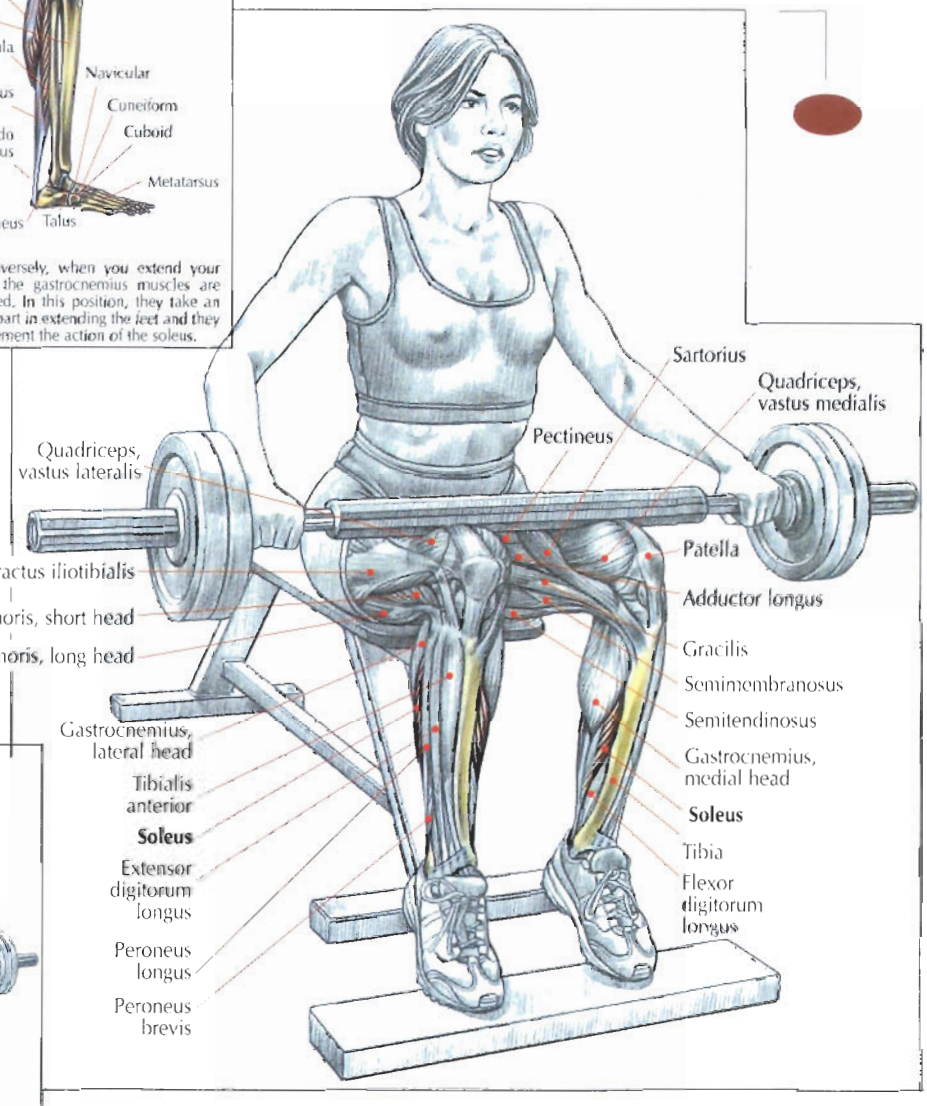


SEATED BARBELL CALF RAISES 18



1. When your knees are flexed, the gastrocnemius muscles, which are attached over the knee joint, are relaxed. In this position, they are only slightly stressed when you extend your foot, the soleus being mostly worked in this action.

2. Conversely, when you extend your knees, the gastrocnemius muscles are stretched. In this position, they take an active part in extending the feet and they complement the action of the soleus.



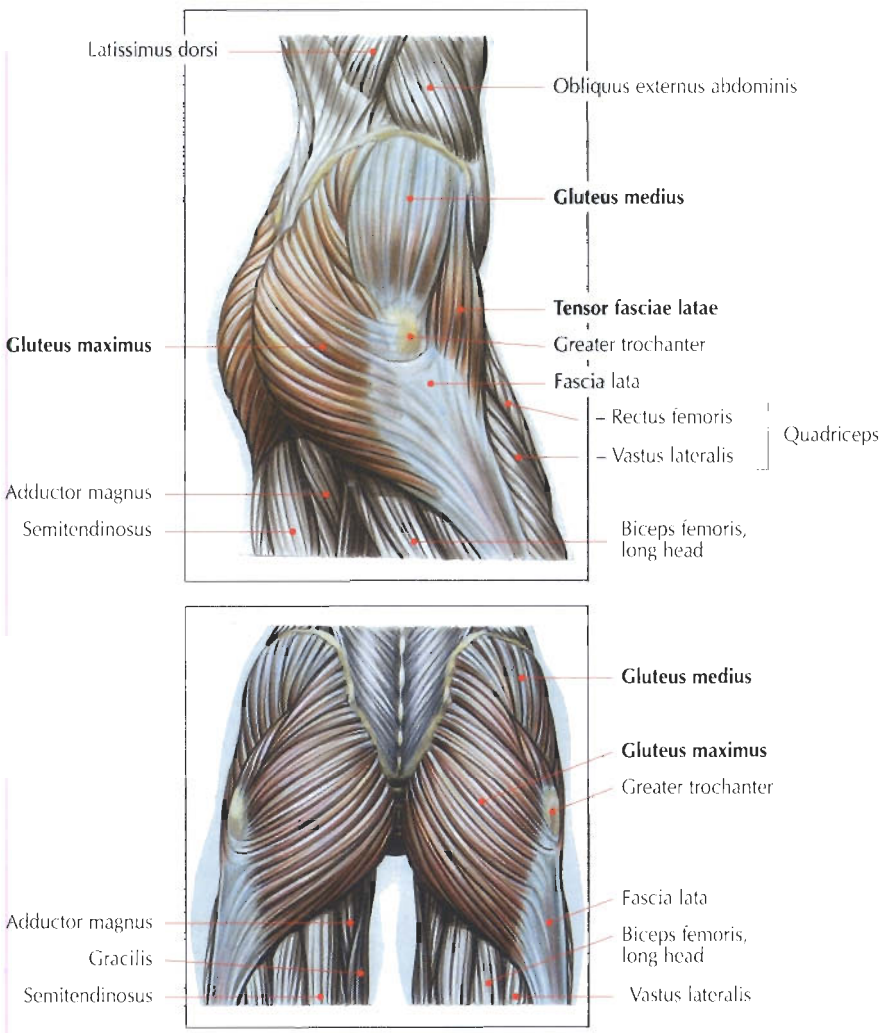
Sit on a bench. Place your toes and the balls of your feet on a toe block:
- Rest the barbell across your lower thighs
- Push down with your toes and extend your feet as completely as possible (plantarflexion)

This exercise isolates the soleus, which belongs to the triceps surae. It is attached under the knee joint on the shin and fibula and it is connected to the calcaneus (via the Achilles tendon). Its function is to extend the ankles. Unlike seated machine calf raises, which allow you to work with heavy weight, you won't be able to do this movement with heavy weight because it will be difficult to load.

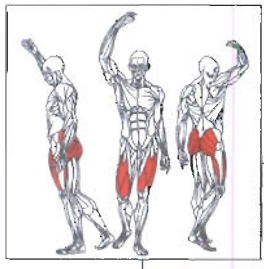
Variation: you can do this movement on a chair or a bench without adding weight. In that case, do long sets until you feel the burning sensation.

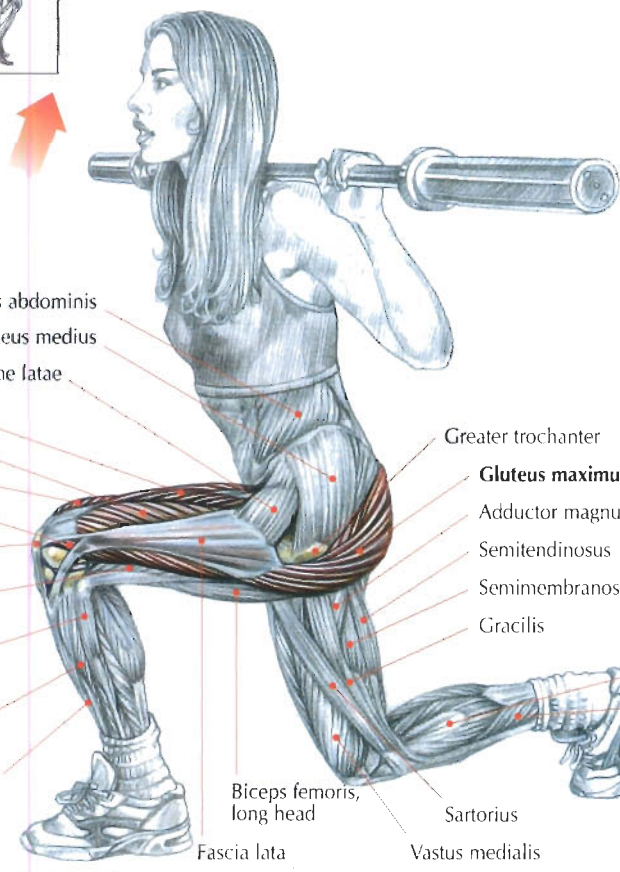
6 BUTTOCKS

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



LUNGES 1



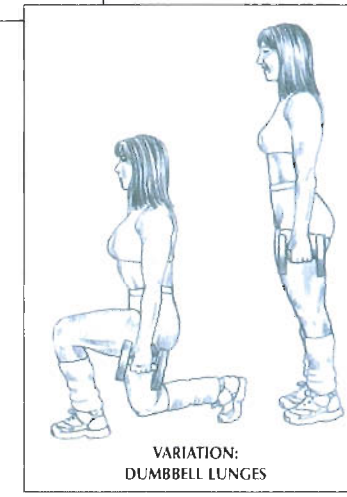


VARIATION:
SIMPLE STEP FORWARD

Stand with your feet hip-width apart. Lift a light 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

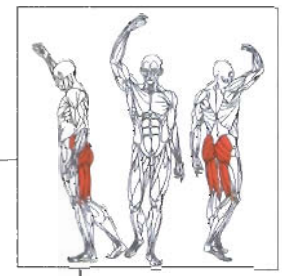
This exercise places primary emphasis on the gluteals. You can vary the stride length by taking (1) a simple step forward to specifically involve the quadriceps, or (2) a large step forward to place more stress on the hamstrings and gluteals while stretching the upper quadriceps and hip flexors of the back leg.

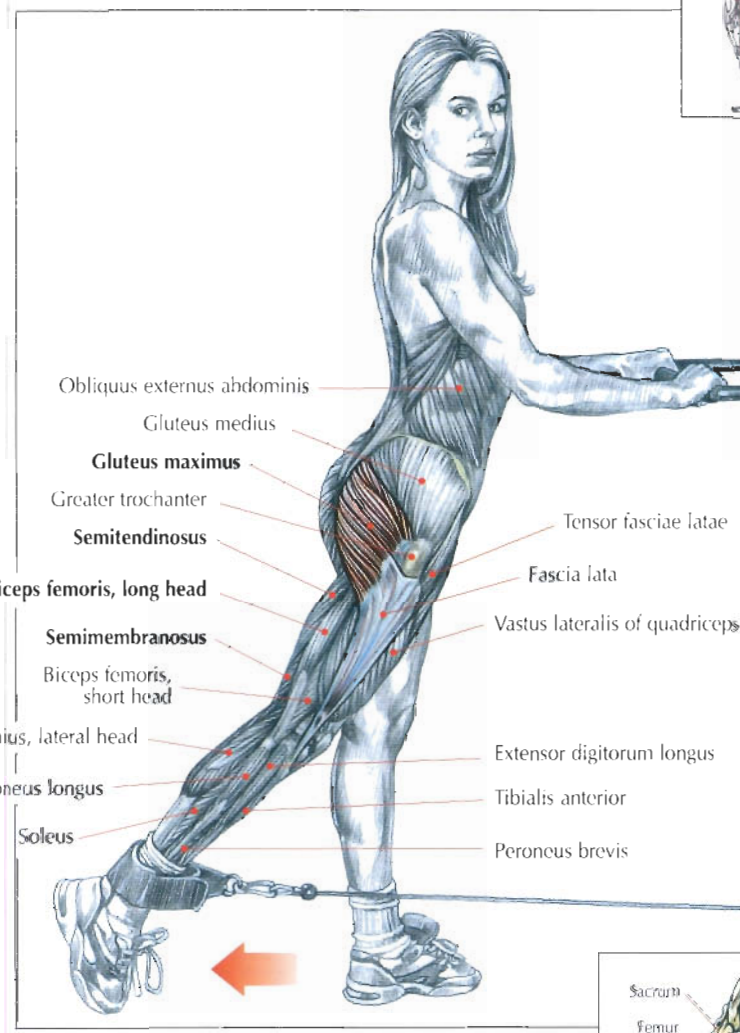
Note: as you lunge forward, you put all of your body weight on your leading leg. It is a relatively difficult exercise to perform because of the balance required. Beginners should start with very light weight.

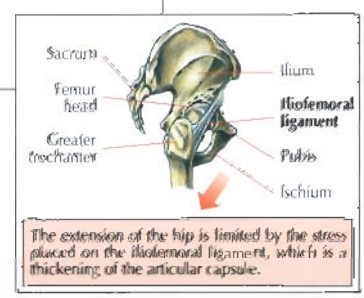


VARIATION:
DUMBBELL LUNGES

2 CABLE BACK KICKS

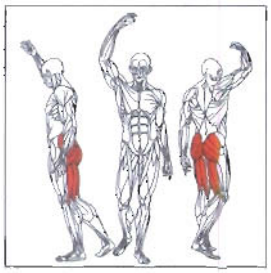




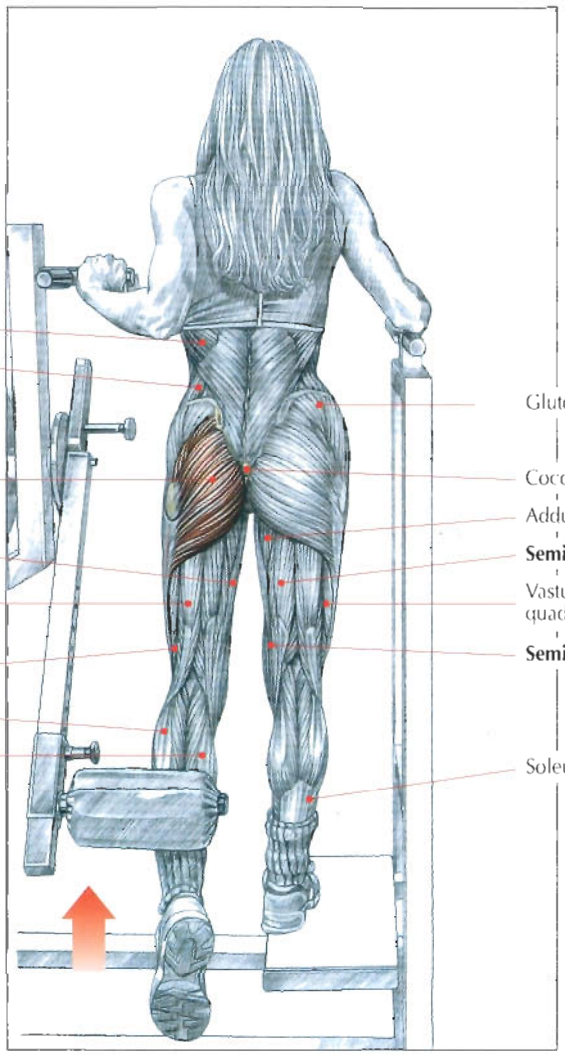


Attach a cuff to the end of the cable running through the low pulley. Fasten the cuff around your ankle. Stand in front of the weight stack and grasp the edge of the machine for support:
- Tilt your pelvis forward
- Bring your leg back

The extension of the hip is limited by the stress placed on the iliofemoral ligament.
This exercise involves the gluteus maximus and, to a lesser extent, the hamstrings except the biceps femoris short head. This exercise allows you to develop shapely legs while increasing muscle tone to your gluteals.



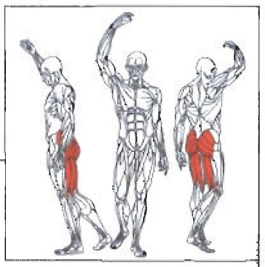
MACHINE HIP EXTENSIONS 3

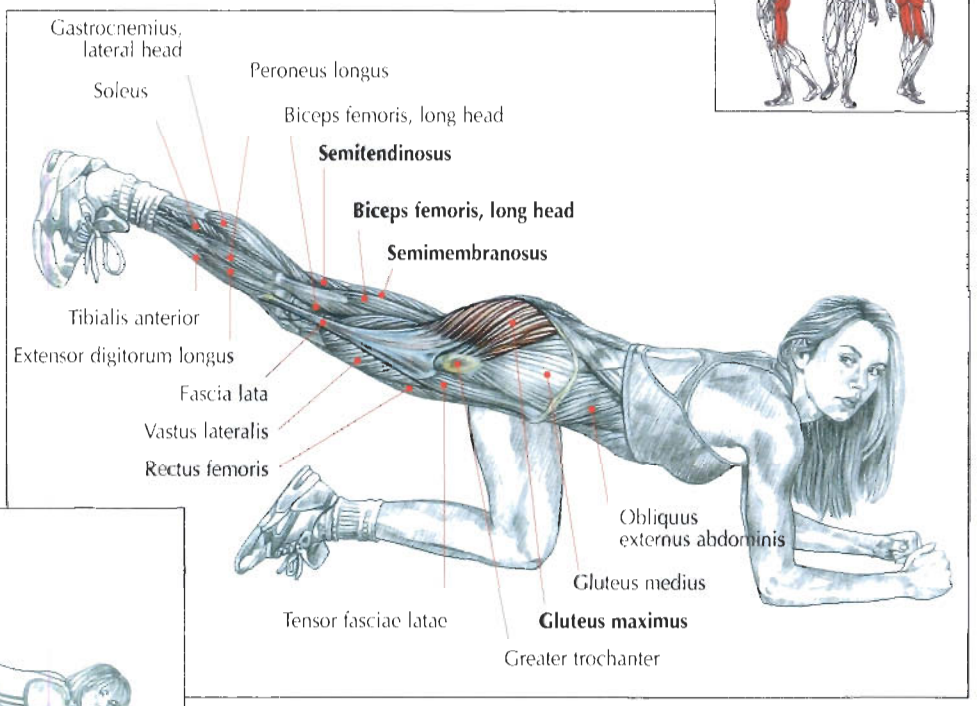


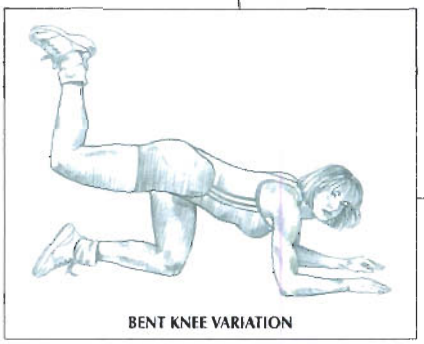
Grasp the handles of the machine, place one foot on the footplate and bring your opposite leg slightly forward, with the pad halfway between knee joint and ankle. Bend forward slightly:
- Inhale and move your thigh to the rear until your hip is fully extended backward (hyperextension)
- Hold this peak contracted position for 2 seconds and return to the starting position
- Exhale as you complete the extension

This exercise works the gluteals, and, to a lesser extent, the semitendinosus, semimembranosus, and biceps femoris long head.

4 FLOOR HIP EXTENSIONS

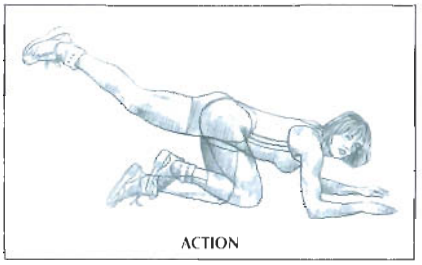






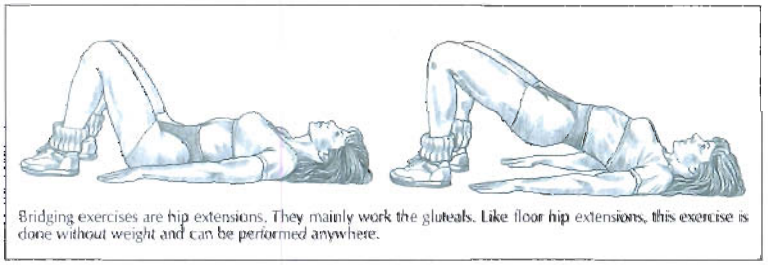
BENT KNEE VARIATION

Kneel on one leg with your elbows or hands on the floor and your forearms straight:
– Tuck your opposite leg under your chest
– Move your tucked leg to the rear until your hip is fully extended

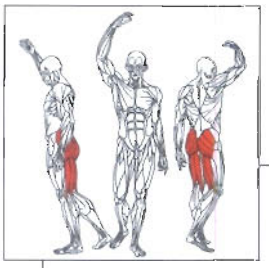


ACTION

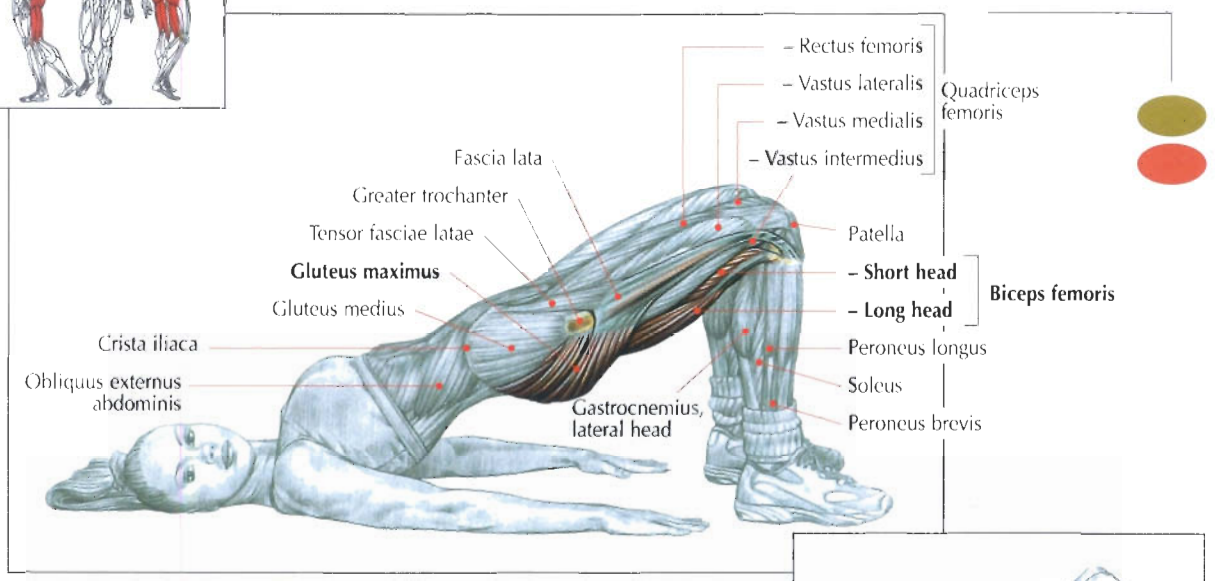
If you swing your leg to a straightened position, the exercise will work the hamstrings and gluteals ; if you keep your knee bent, it will only work the gluteals, but less intensely. You can increase the range of motion or limit it at the end of the extension. You can hold a peak contracted position for a couple of seconds at the end of the movement. For more intensity, strap 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 aerobics classes.

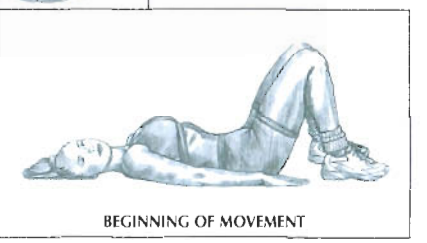


Bridging exercises are hip extensions. They mainly work the gluteals. Like floor hip extensions, this exercise is done without weight and can be performed anywhere.



BRIDGING 5

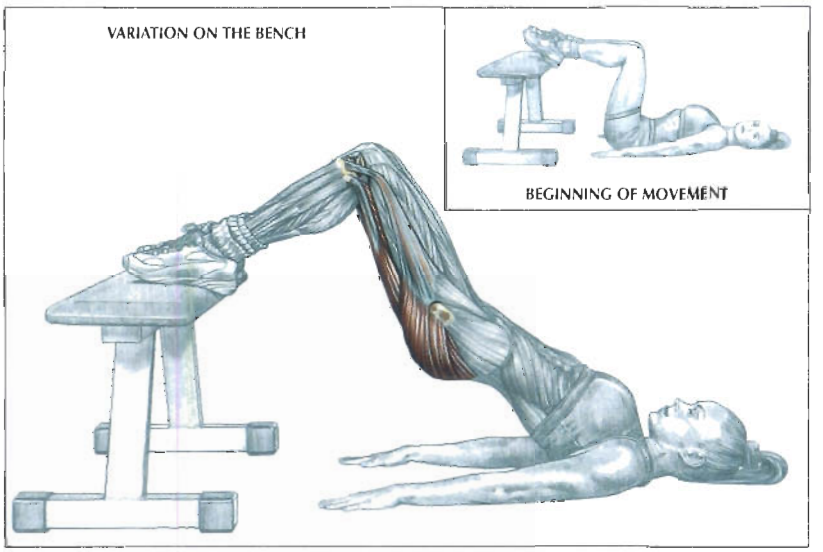




Lie on the floor with your entire spine in contact with the floor. Place your hands on the floor next to your hips. Flex your knees to 90 degrees:
– Lift your buttocks off the floor, pushing with your feet as high as you can
– Hold the position for 2 seconds and lower your pelvis without putting your buttocks back on the floor
– Immediately repeat

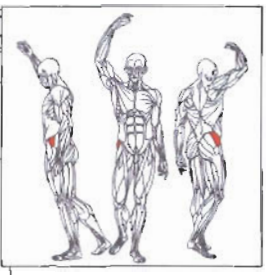
This exercise works the hamstrings and gluteals.
Make sure you correctly feel the muscle contraction at the end of every repetition.

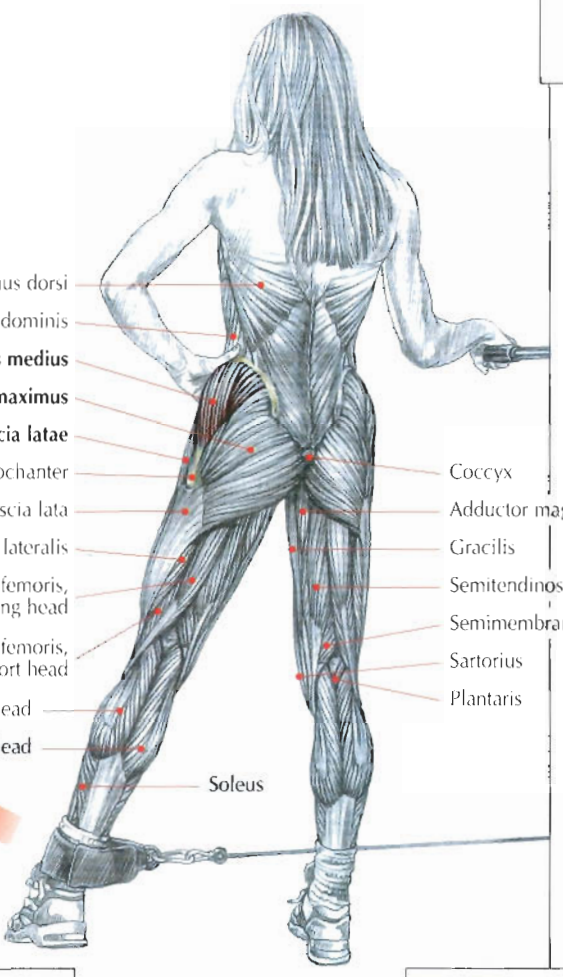
Note: this easy exercise has proved beneficial. It is performed in most aerobics classes.

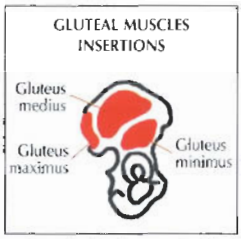


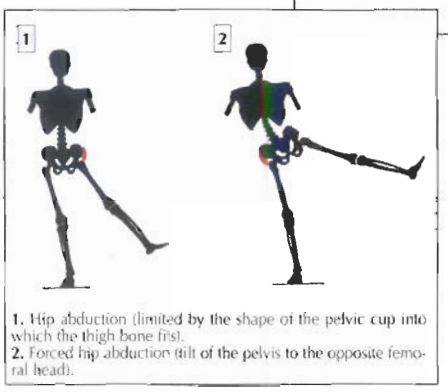
Variations:
1. You can do the movement with a limited range of motion.
2. For more intensity, you can put your feet on a bench.

6 CABLE HIP ABDUCTIONS





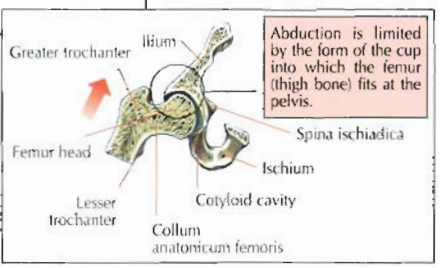


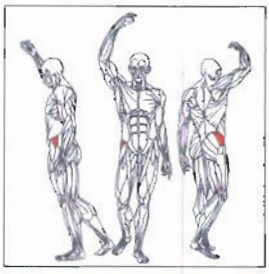


1. Hip abduction (limited by the shape of the pelvic cup into which the thigh bone fits).
2. Forced hip abduction (tilt of the pelvis to the opposite femoral head).

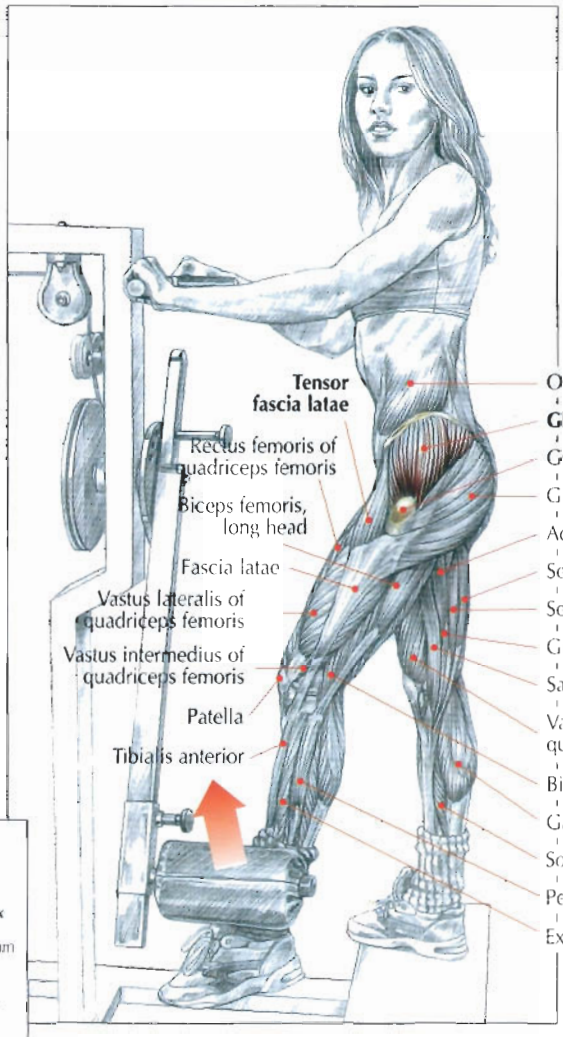
Attach a low pulley to your ankle:
– Grasp the edge of the machine with your opposite hand to stabilize your body.
– Raise lateraly your leg as far as you can.

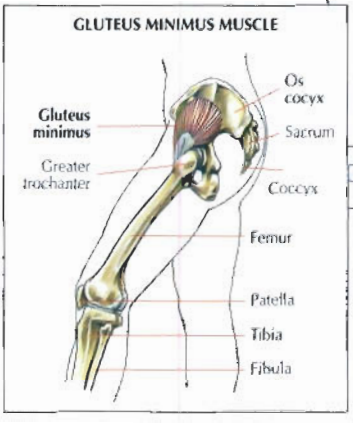
This exercise involves the gluteus maximus, the deeper gluteus minimus, and tensor fascia latae.





STANDING MACHINE HIP ABDUCTIONS 7

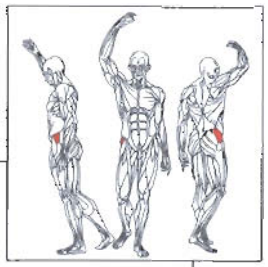


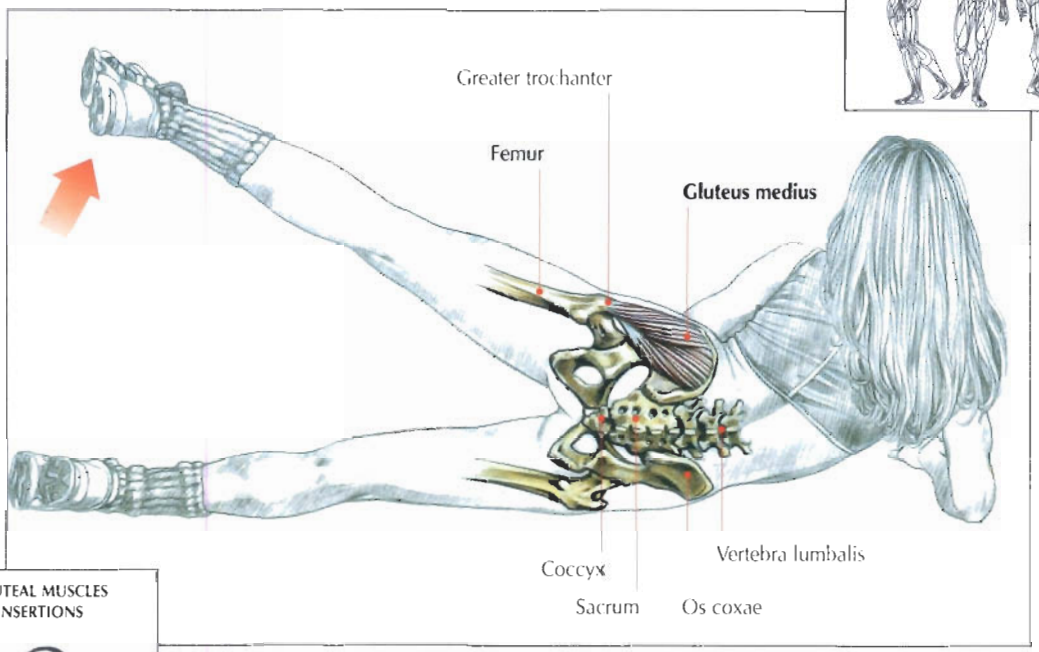


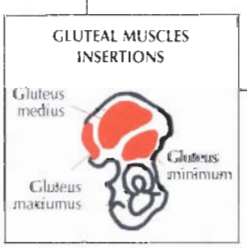
Place one foot on the footplate and place the outer side of your other leg against the pad below your knee (close to your ankle):
– Move this leg as high to the side as possible
– Note the abduction is limited because the neck of the femur (thigh bone) is rapidly stopped on the rim of the cup into which the femur fits at the pelvis

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

8 FLOOR HIP ABDUCTIONS

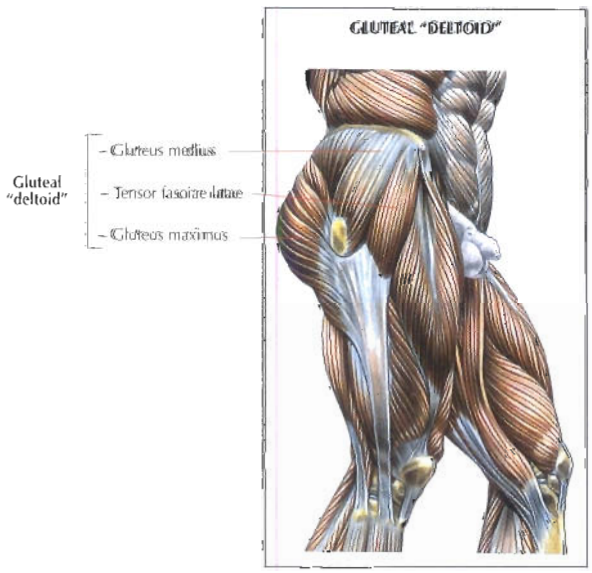


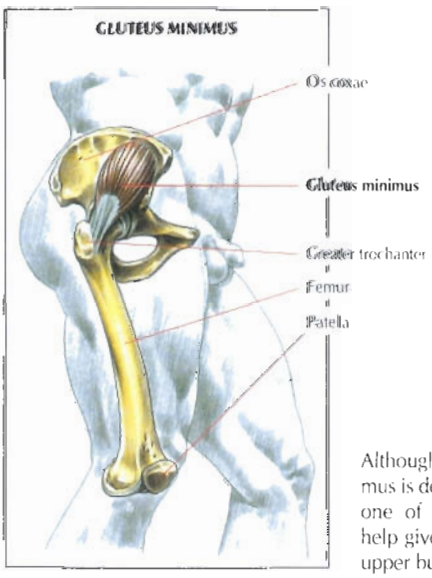




Lie on your side with your head and shoulders in line:
- **Lift** your leg to an angle of 70 degrees (at the most) off the floor, always keeping your knee extended
- **Return** to the starting position and repeat

This exercise involves the gluteus medius and gluteus minimus. 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 lither slightly forward, slightly backward, or vertically. For more resistance, strap a soft weight around your ankle or use a low pulley.

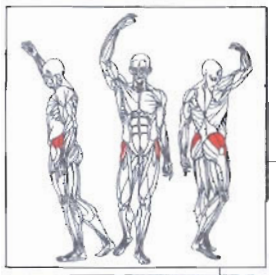


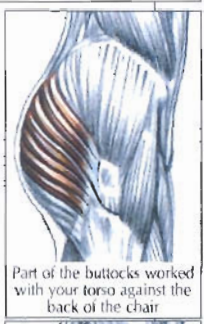


Although the gluteus minimus is deeply situated, it is one of the muscles that help give more size to the upper buttocks.

SEATED MACHINE HIP ABDUCTIONS

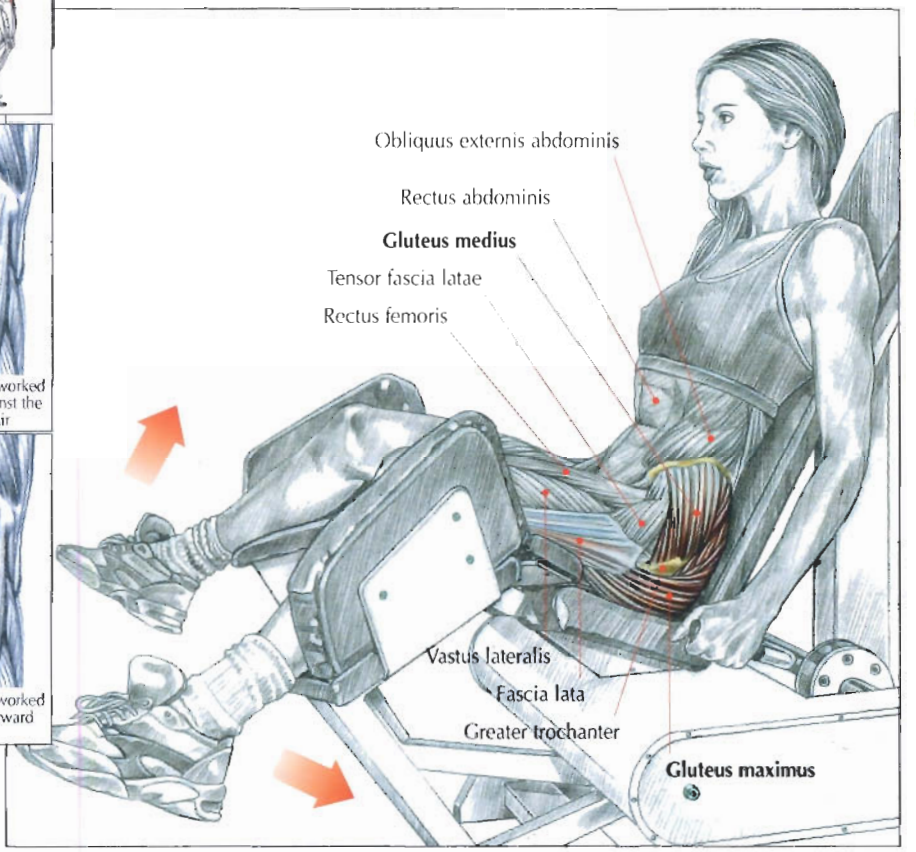
9

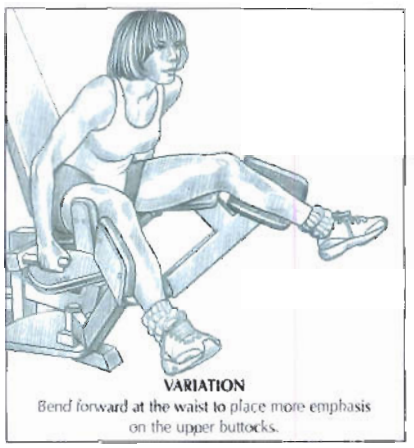




Part of the buttocks worked with your torso against the back of the chair

Part of the buttocks worked when you bend forward at the waist

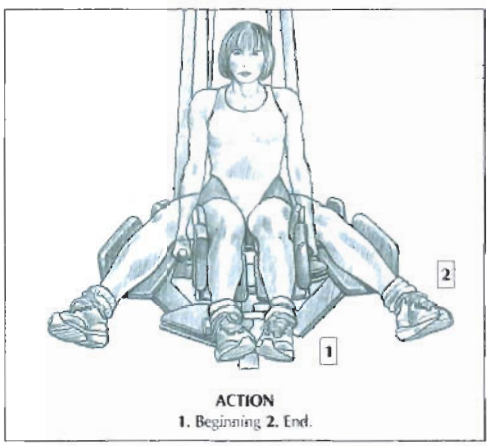




VARIATION
Bend forward at the waist to place more emphasis on the upper buttocks.

Sit at an abductor machine:
– Slowly force 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 torso in every set. Simply 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.



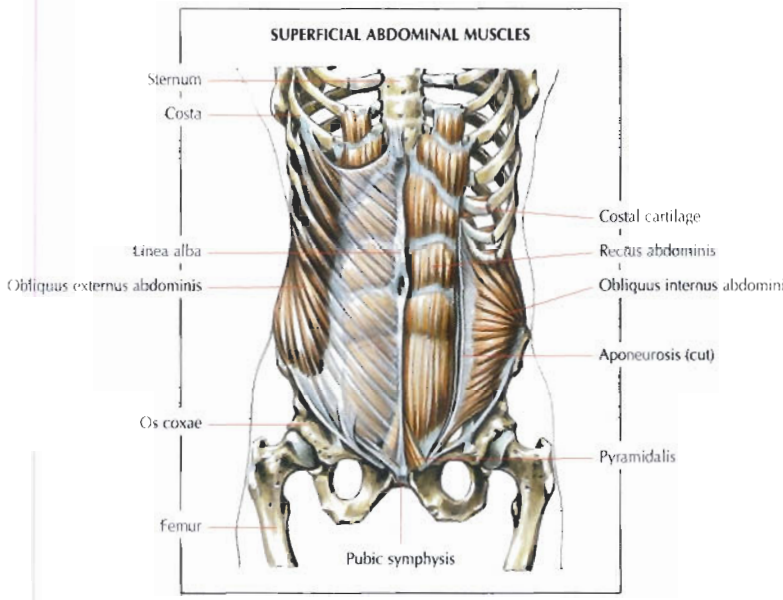
ACTION
1. Beginning **2.** End.

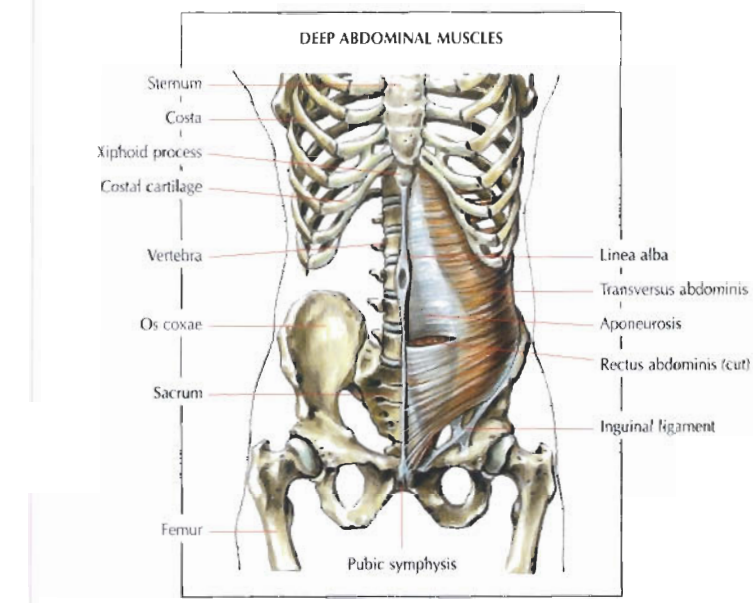
This exercise is an excellent way to increase muscle tone to the upper part of the hip. It gives the buttocks a rounded appearance, making your waist look slimmer.

7 ABDOMEN

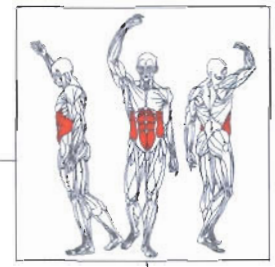
1. Crunches
2. Sit-Ups
3. Gym Ladder Sit-Ups
4. Calves Over Bench Sit-Ups
5. Incline Bench Sit-Ups
6. Specific Bench Sit-Ups
7. High Pulley Crunches
8. Machine Crunches
9. Incline Leg Raises
10. Leg Raises
11. Hanging Leg Raises
12. Broomstick Twists
13. Dumbbell Side Bends
14. Roman Chair Side Bends
15. Machine Trunk Rotations

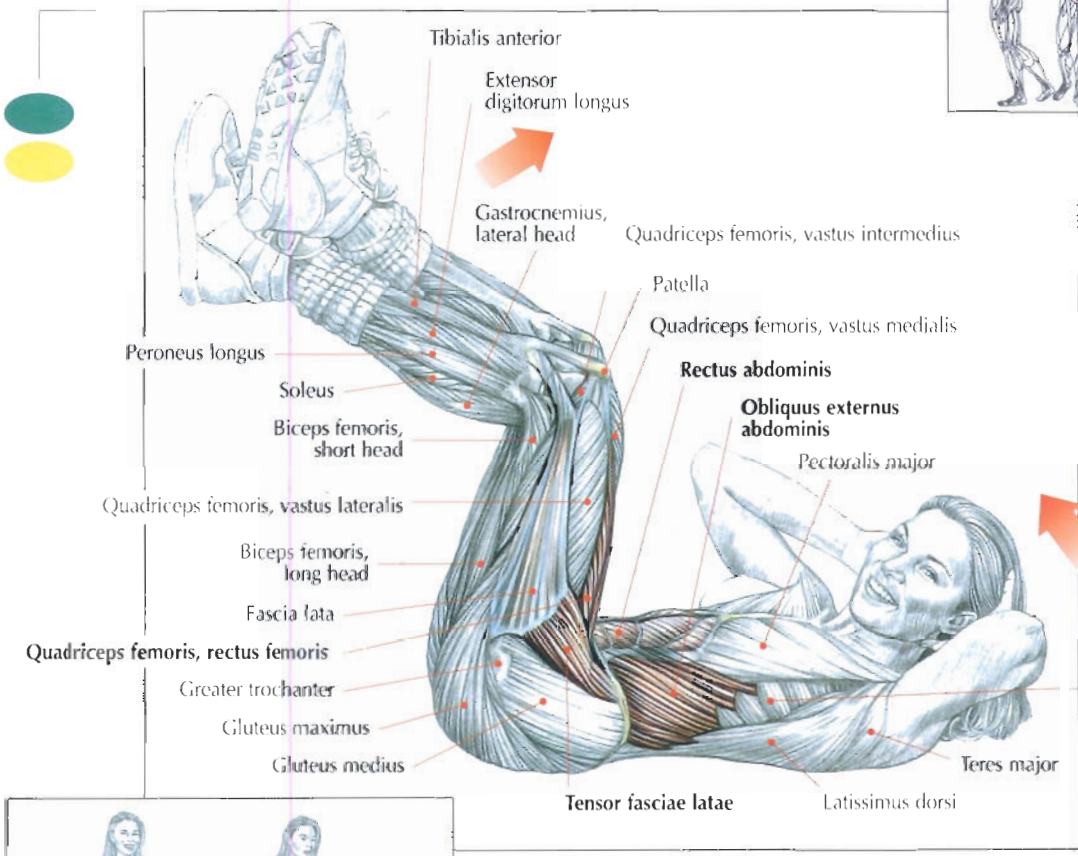
Although this is a much-debated topic, if you have lower back problems, you should keep your hip motionless in order to neutralize the action of the psoas and prevent abnormal forward curvature of the spine (lordosis) or other spinal pathologies. Therefore, it is better to stress the rectus abdominis without stretching them, by moving the sternum (breastbone) closer to the pubis with short contractions.

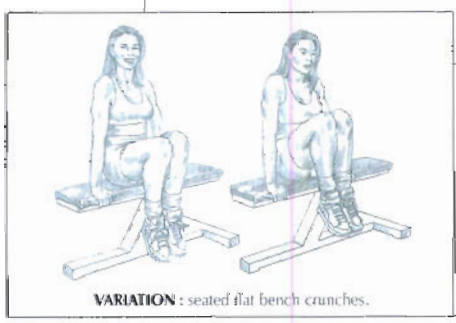




1 CRUNCHES



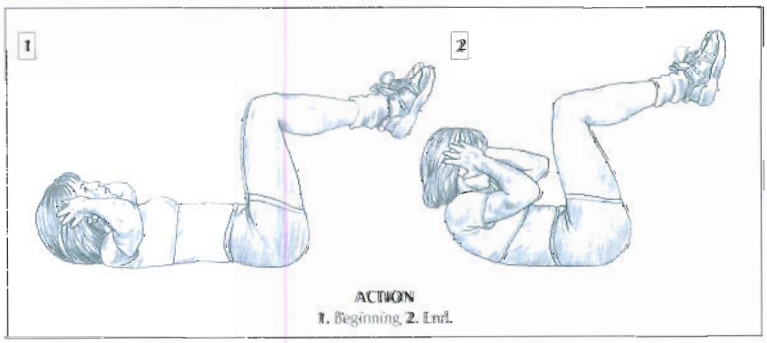




VARIATION : seated flat bench crunches.

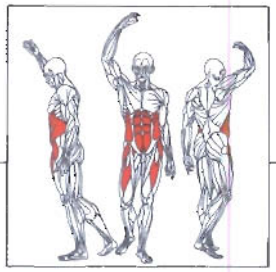
Lie on your back. Place your hands behind your head. Flex your hips and knees to a 90 degrees angle:
– Inhale and lift your shoulders off the floor, moving your knees closer to your head by shortening your torso
- Exhale as you complete the movement

This exercise particularly works the rectus abdominis. To place more emphasis on the obliques, simply 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).

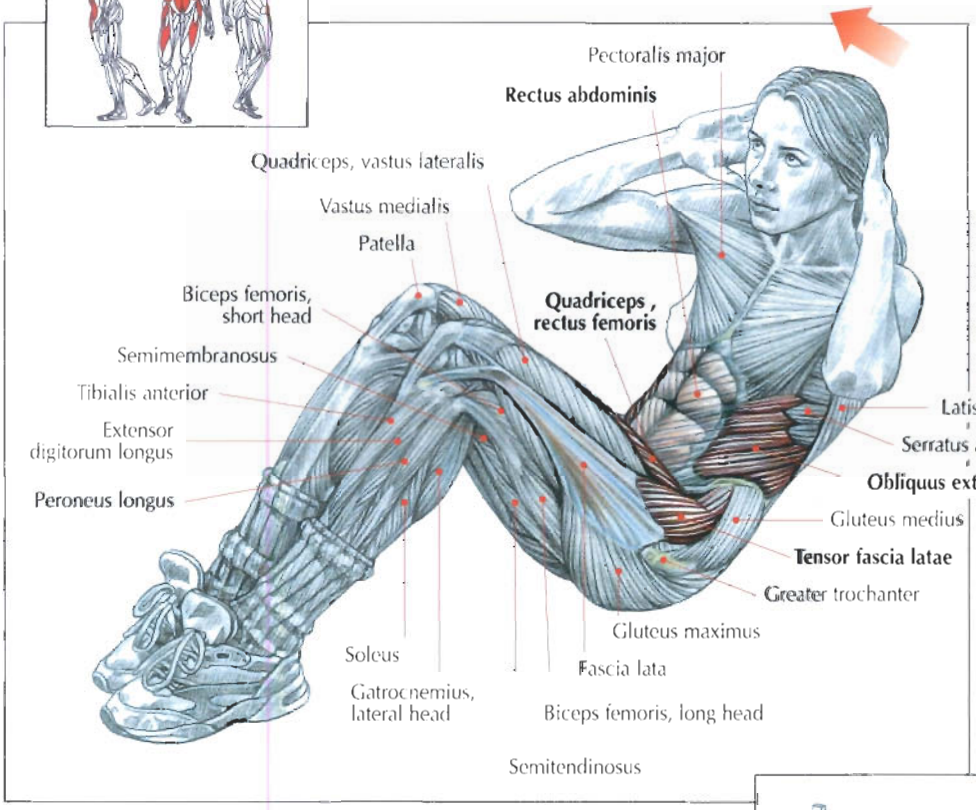


ACTION
1. Beginning **2.** End.

The object of the crunch is to shorten your torso, moving your pubis closer to your breastbone by deliberately contracting your abdominals.



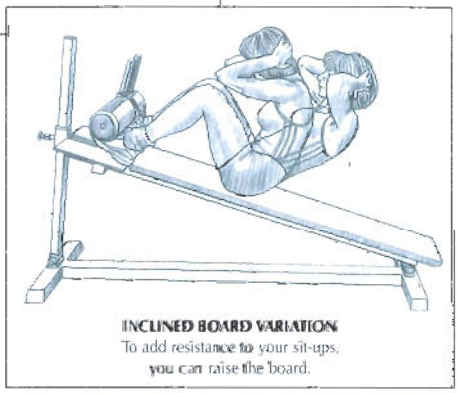
SIT-UPS 2



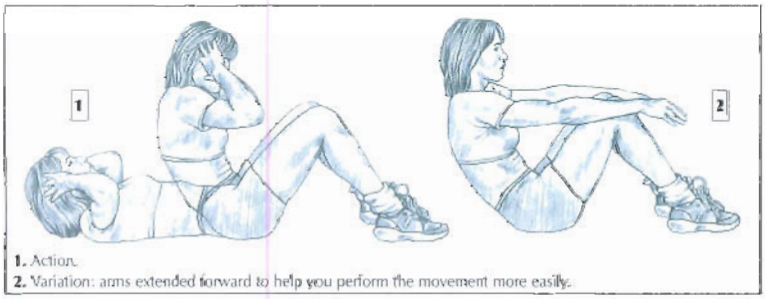
Lie on your back with your legs bent and your feet on the floor. Place your hands behind your head:
- Inhale and curl your torso off the floor
- Exhale as you complete the movement
- Return to the starting position without resting your torso on the floor
- Repeat until you feel the burning sensation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

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

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

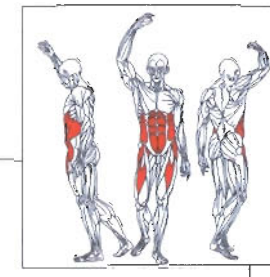


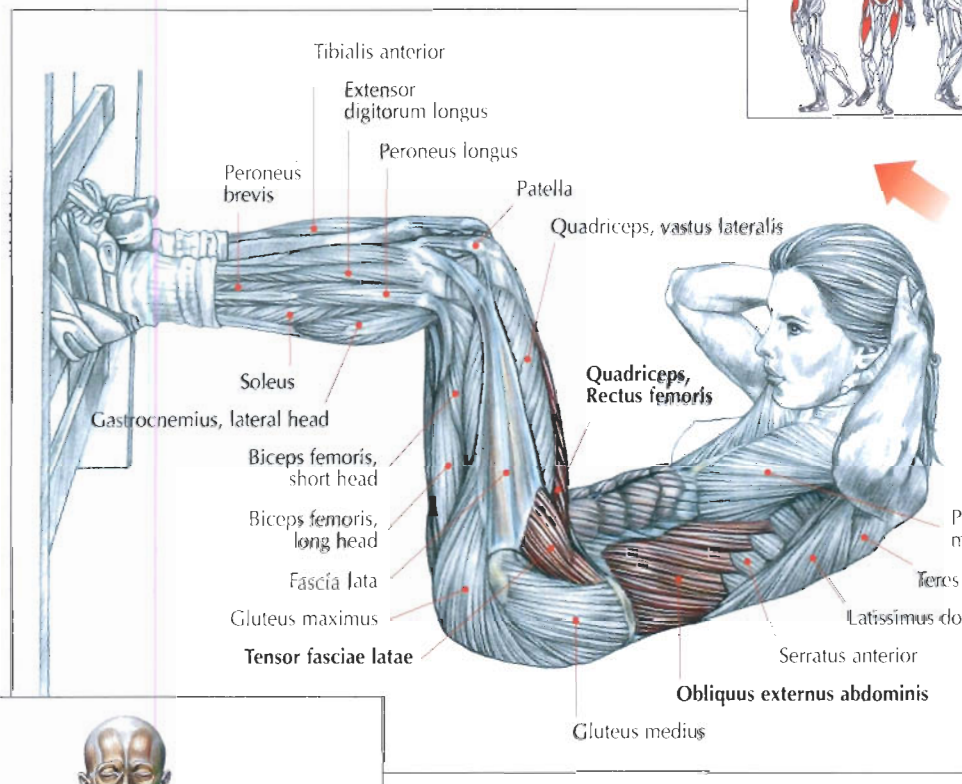
INCLINED BOARD VARIATION
To add resistance to your sit-ups, you can raise the board.

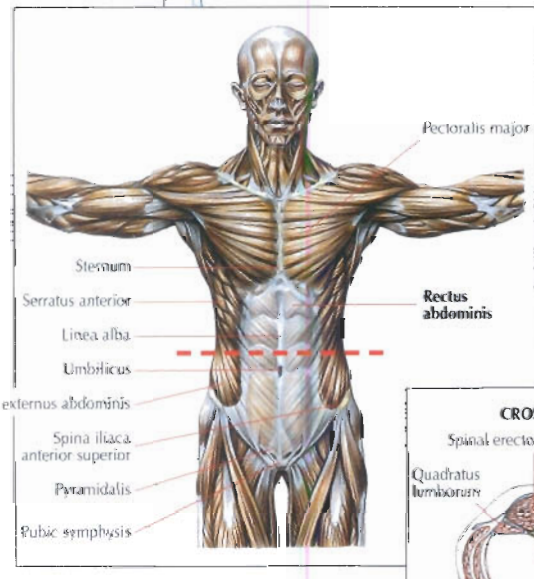


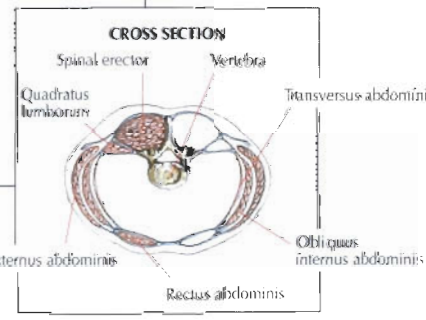
1. Action.
2. Variation: arms extended forward to help you perform the movement more easily.

3 GYM LADDER SIT-UPS







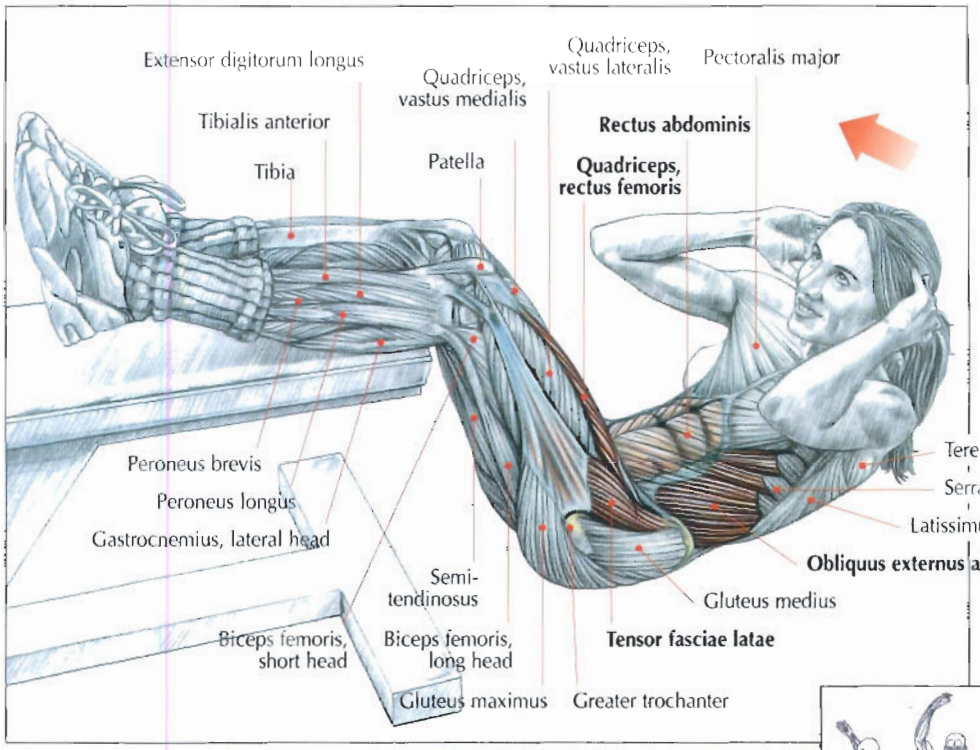


Hook your feet in the gym ladder with your hips and knees flexed to 90 degrees. Place your hands behind your head:
– Inhale and curl your torso as high as possible off the floor
– Exhale as you complete the movement

This exercise focuses on the rectus abdominis and places secondary emphasis on the internal and external obliques.
Place your torso farther from the gym ladder and hook your feet lower to increase pelvic mobility, allowing a greater range of motion and more involvement of the hip flexors.

CALVES OVER BENCH SIT-UPS

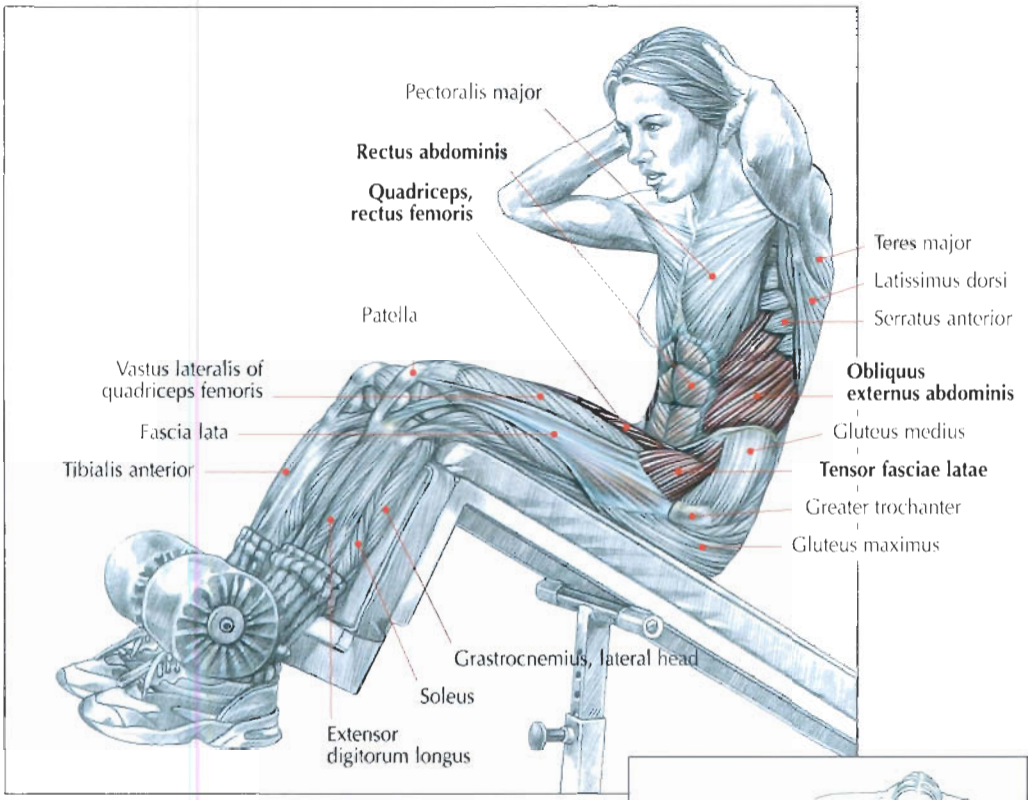
4

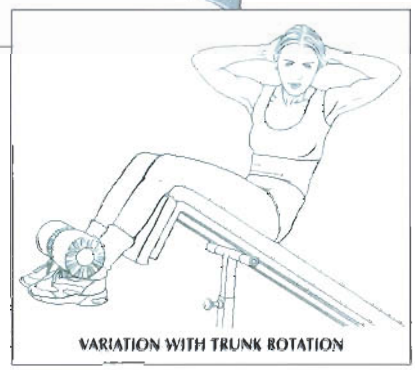


Lie on your back with your calves laying over a flat exercise bench. Place your hands behind your head:
- Inhale and lift your shoulders off the floor
- Try to touch your knees with your head
- Exhale as you complete the movement

This exercise focuses on the rectus abdominis, particularly above the navel. By placing your torso farther from the bench you increase pelvic mobility which allows your torso upward by contracting the iliopsoas, tensor fasciae latae, and rectus femoris in order to flex the hips.

5 INCLINE BENCH SIT-UPS




VARIATION WITH TRUNK ROTATION

Sit on the bench and hook your feet under the roller pads. Place your hands behind your neck:
- Inhale and incline your torso less than 20 degrees
- Move your torso back up, slightly curling your torso to place more stress on the rectus abdominis
- Exhale as you complete the movement

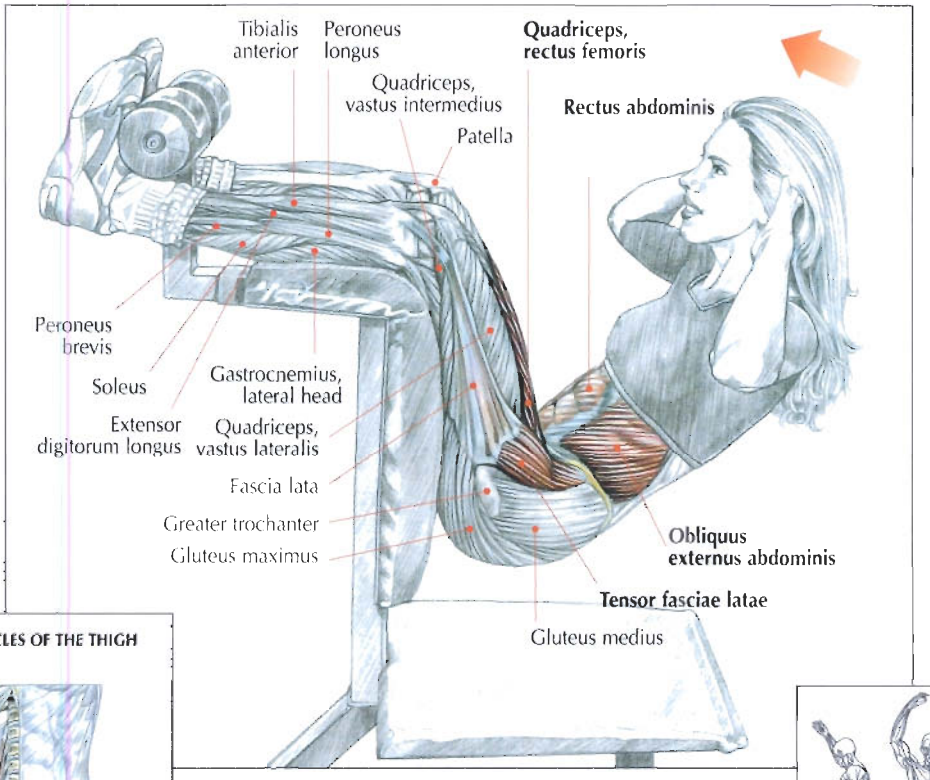
This exercise works the entire rectus abdominis muscle wall, as well as the iliopsoas, tensor fasciae latae, and rectus femoris in the quadriceps group. The function of these last three muscles is to tilt the pelvis forward.

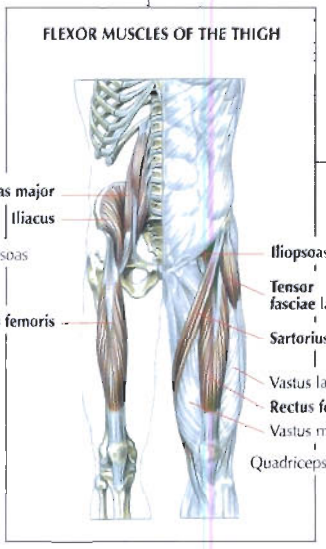
Variation: as you move back up, you can twist alternately to each side on successive repetitions to shift part of the stress to the obliques.

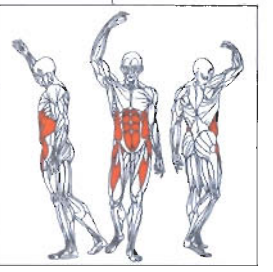
Example: twisting your torso to the left will more intensely involve the right external oblique, left internal oblique, and the right rectus abdominis.

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

SPECIFIC BENCH SIT-UPS 6



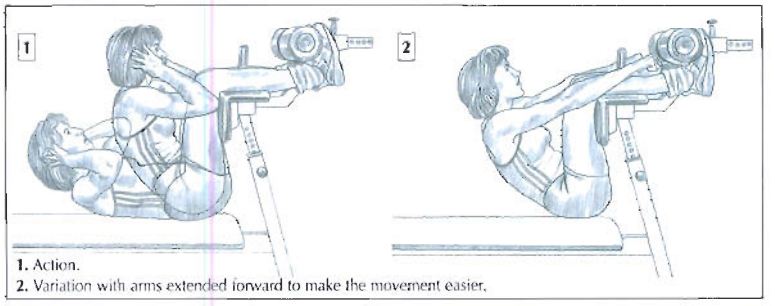




Hook your feet under the roller pads with your torso hanging parallel to the floor. Place your hands behind your head:
- Inhale and curl your torso upward
- Try to touch your knees with your head, being sure to shorten your torso
- Exhale as you complete the contraction

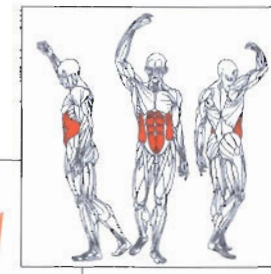
This is an excellent exercise for building up the rectus abdominis. It places secondary emphasis on the obliques. The pelvic tilt intensely works the rectus femoris, iliopsoas, and tensor fasciae latae.

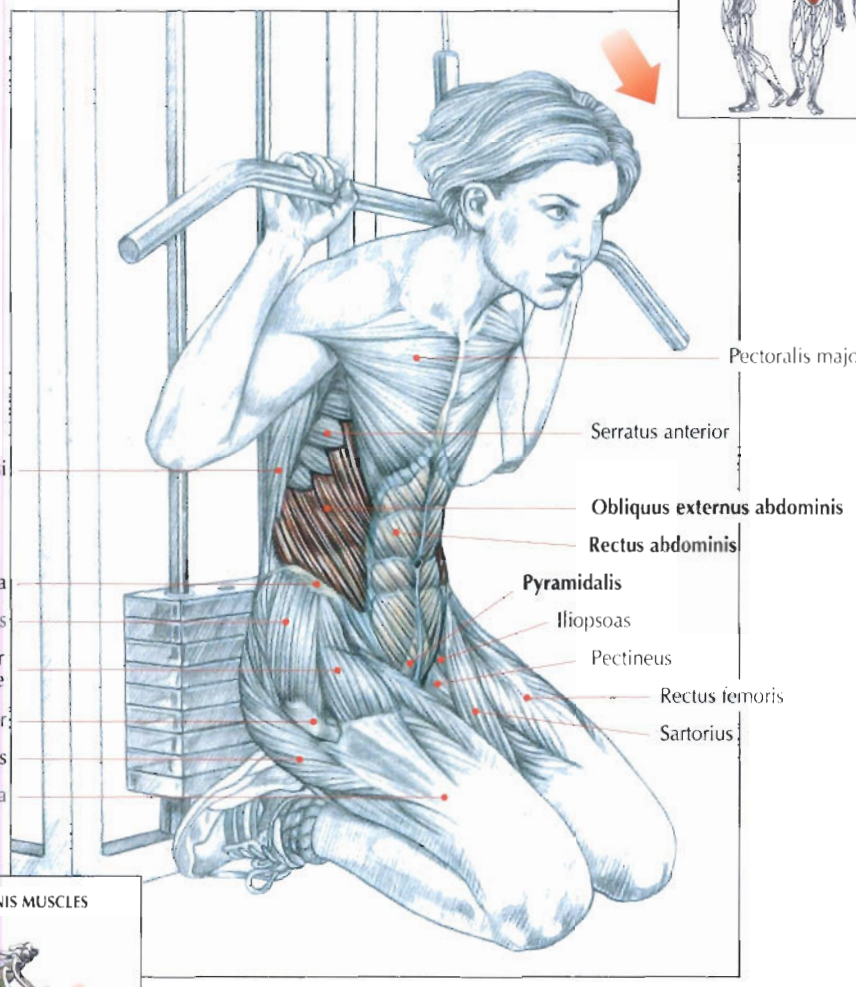
Note: beginners should start with easier exercises to gain the strength level required.



1. Action.
2. Variation with arms extended forward to make the movement easier.

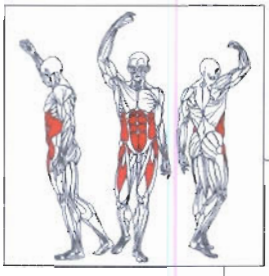
7 HIGH PULLEY CRUNCHES



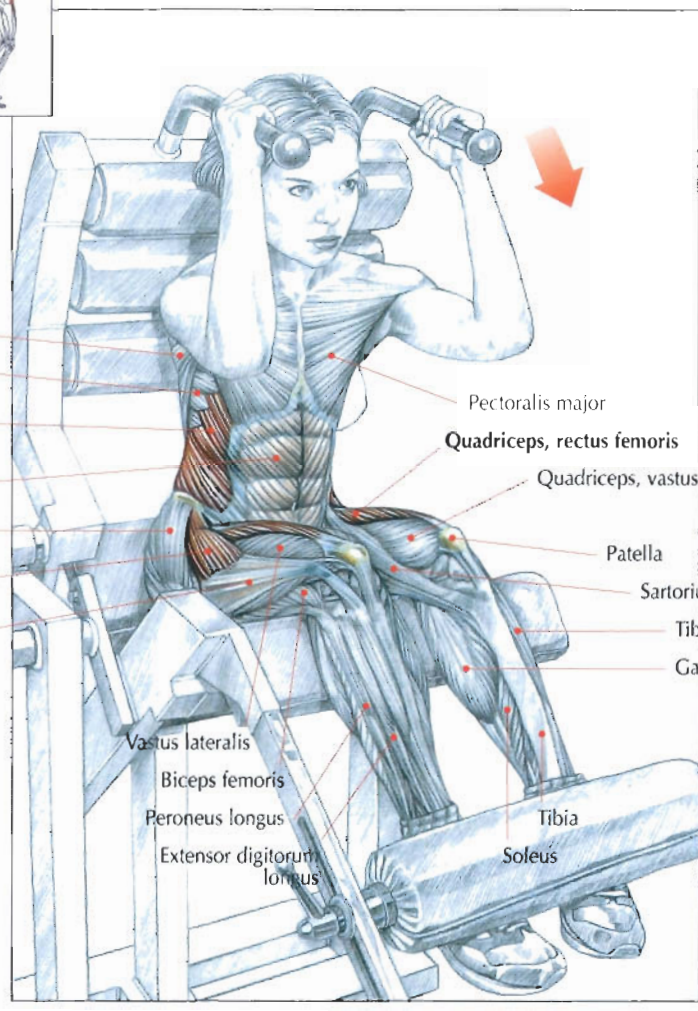


Kneel down with the bar behind your neck:
– Inhale and shorten your torso to move your chest toward your thighs
– Exhale during the performance

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



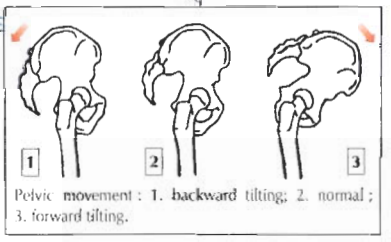
MACHINE CRUNCHES 8



Sit on the machine, grasp the handles, and hook your feet under the roller pad:
– Inhale and shorten your torso, trying to move your chest toward your thighs
– Exhale at the end of the movement

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

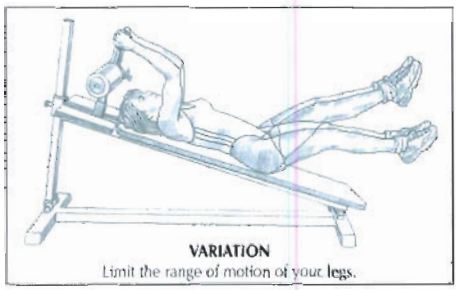
9 INCLINE LEG RAISES



Pelvic movement : 1. backward tilting; 2. normal ; 3. forward tilting.

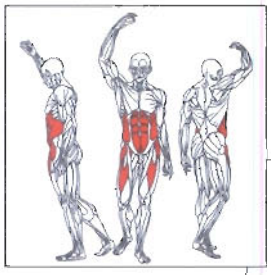
Lie on your back on an inclined abdominal board and grasp the rungs:
- Move your feet until they are directly above your hips
- Raise your hips by shortening your torso, trying to touch your head with your knees

As you raise your legs, the iliopsoas, tensor fasciae latae, and rectus femoris in the quadriceps group are worked. Then, as you raise your hips and shorten your torso, the abdominals (particularly the rectus abdominis) are involved.

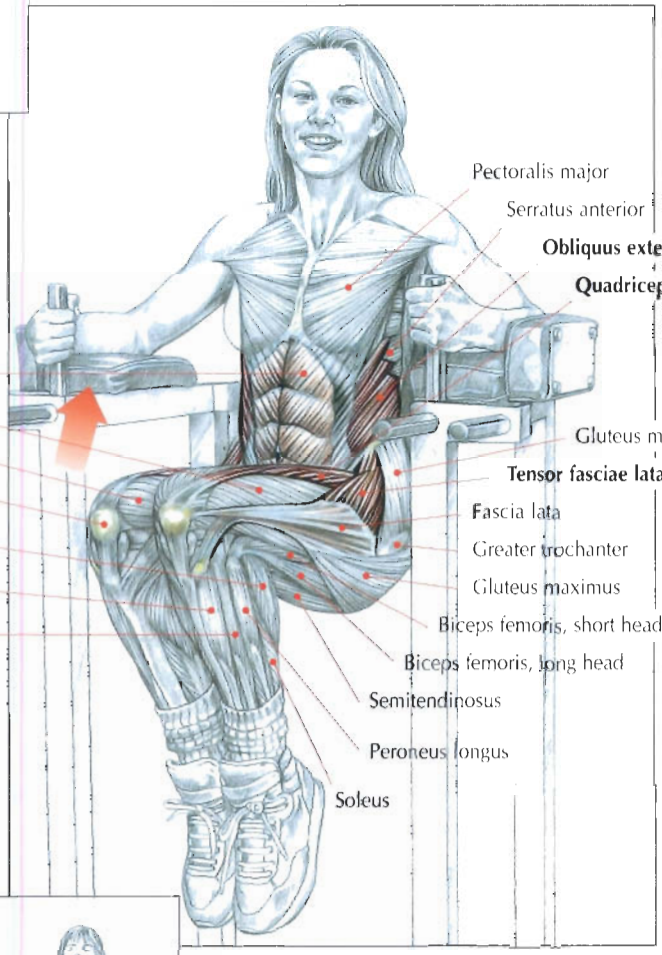


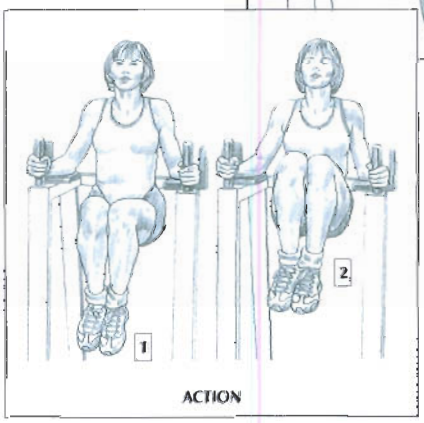
VARIATION
Limit the range of motion of your legs.

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 board to a lower angle.



LEG RAISES 10





Rest your elbows on the elbow support pads and position the lumbar support pad in the small of your back:
– Inhale and pull your knees up to your chest, rounding your back to contract your abdominals correctly
– Exhale as you complete the movement

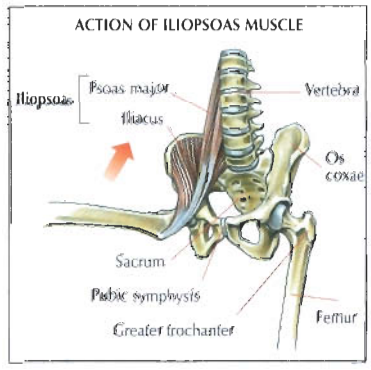
This exercise works the hip flexors, particularly the iliopsoas, obliques, and rectus abdominis.

Variations:

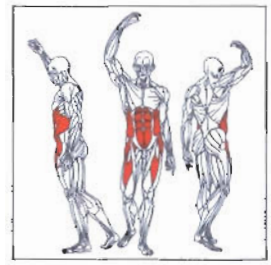
1. To isolate the abdominals, limit the range of motion but never lower your knees to a position below the horizontal plane and always keep a slight curve in your spine.

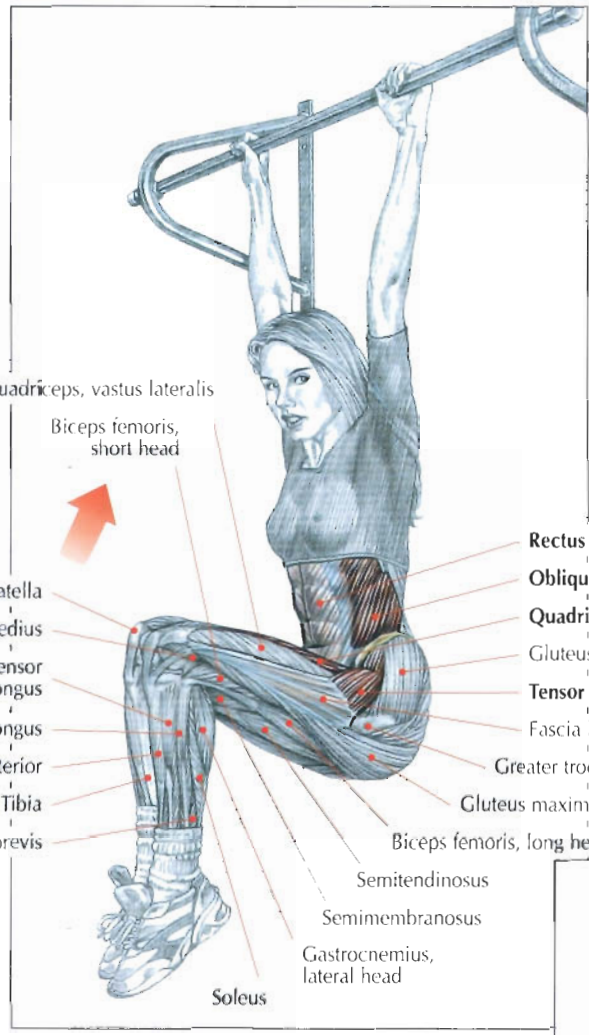
2. To increase the difficulty of this movement, you can perform it with your legs straight. However, doing so requires flexible hamstrings.

3. You can hold the peak contracted position (knees tucked to chest) for a few seconds.



11 HANGING LEG RAISES

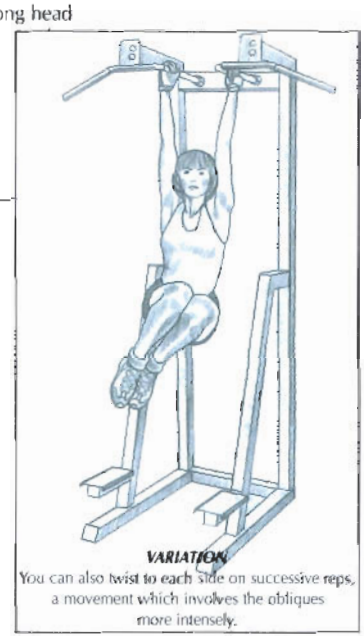




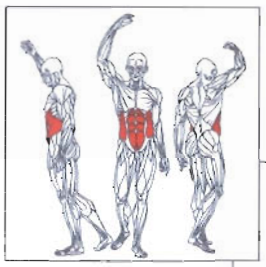
Take an overhand grip on a chin-up bar. Hang straight.
- Inhale and raise your knees as high as possible, being sure to move your knees to your chest by shortening your torso
- Exhale as you complete the movement

This exercise works the following muscles:
- the iliopsoas, rectus femoris, and tensor fasciae latae as you raise your legs; and
- the rectus abdominis and, to a lesser extent, the obliques as you move your knees to your chest.

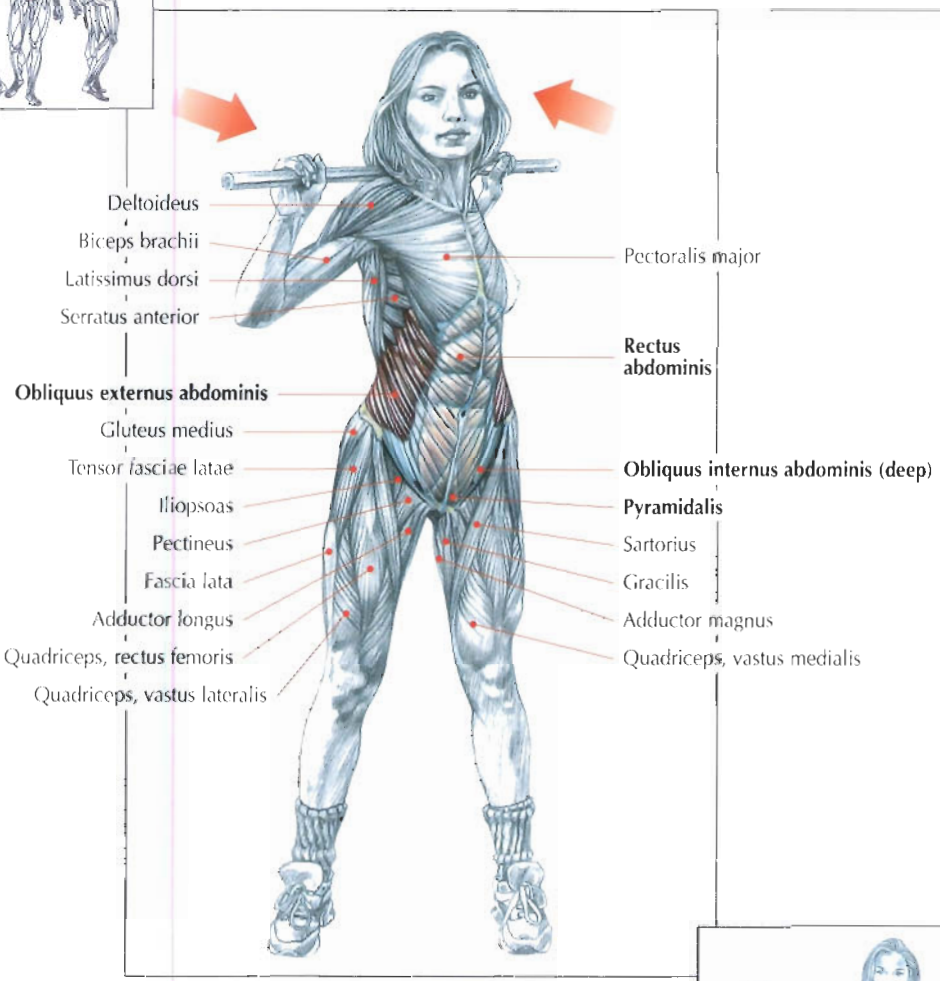
To isolate the abdominals, limit the range of motion, without lowering your knees to a position below the horizontal plane.



VARIATION
You can also twist to each side on successive reps, a movement which involves the obliques more intensely.

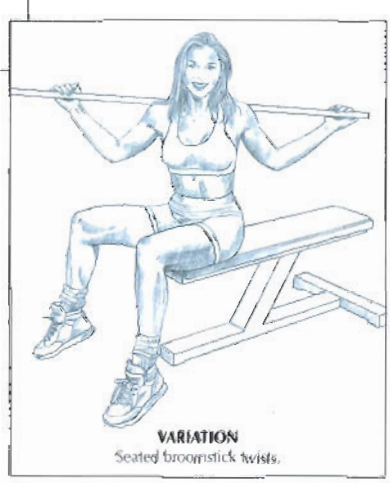


BROOMSTICK TWISTS 12



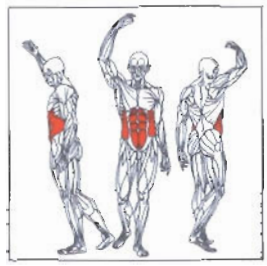
Stand with your feet spread. Hold a broomstick across your trapezius, above the posterior deltoids. Make sure you don't pull or hang too much on the broomstick:
- Rotate your upper body from side to side
- Keep your pelvis (hips) motionless by contracting the gluteals isometrically throughout the movement

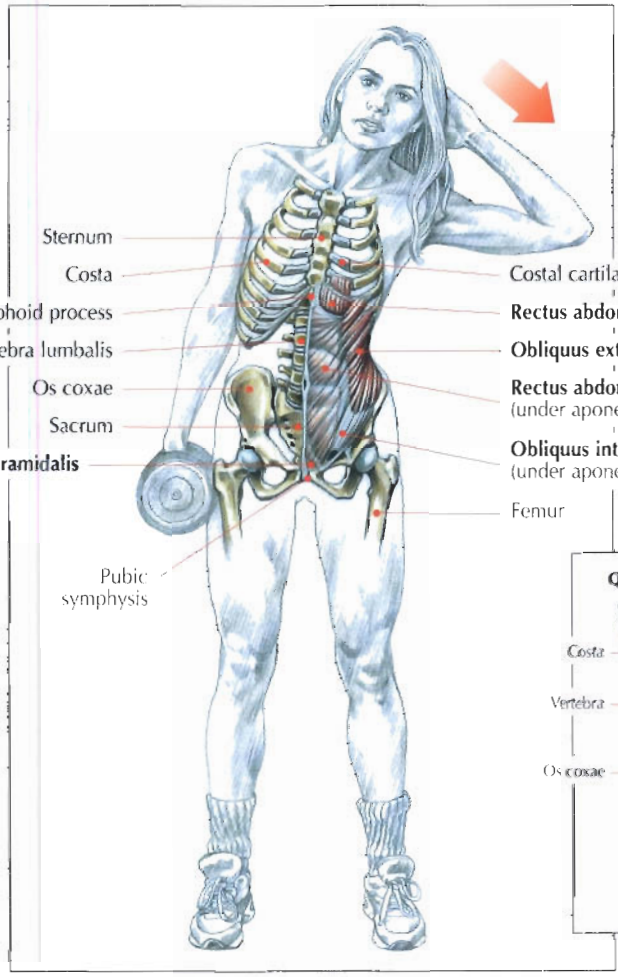
As you rotate your right shoulder forward, this movement works the right external oblique, left internal oblique, and, to a lesser extent, the rectus abdominis and the left spinal erectors. To add intensity, you may slightly round your back. This exercise can also be done while sitting on a bench with your legs straddling the bench to keep your hips stationary and isolate the abdominals.

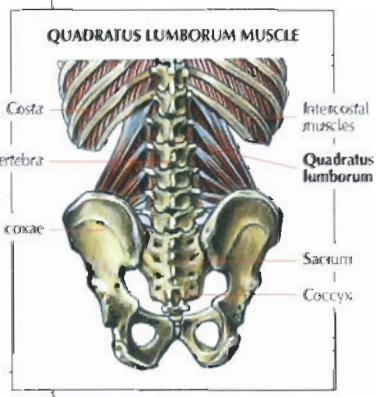


VARIATION
Seated broomstick twists.

13 DUMBBELL SIDE BENDS

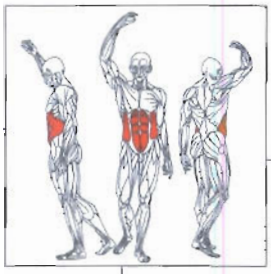




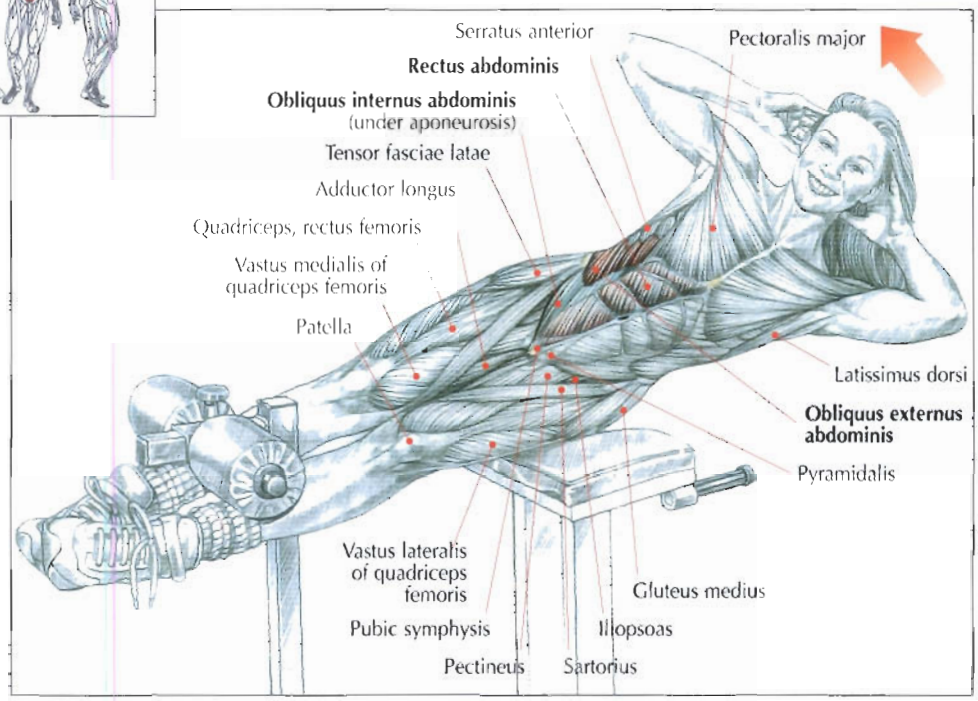


Stand with your feet slightly apart. Place your left hand behind your neck, holding a dumbbell in your right hand:
– Bend your torso to the left side
– Return to the starting position, or move slightly farther to the other side by bending at the waist passively

Be sure to do an equal number of sets and reps with the dumbbell held in each hand. Don't rest between the sets.
This exercise focuses on the obliques of the side you bend with and places secondary emphasis on the rectus abdominis and quadratus lumborum (muscle of the back attached to the 12th rib, transverse apophyses of the lumbar vertebrae, and crest of the shin).



ROMAN CHAIR SIDE BENDS 14

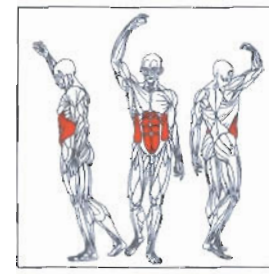


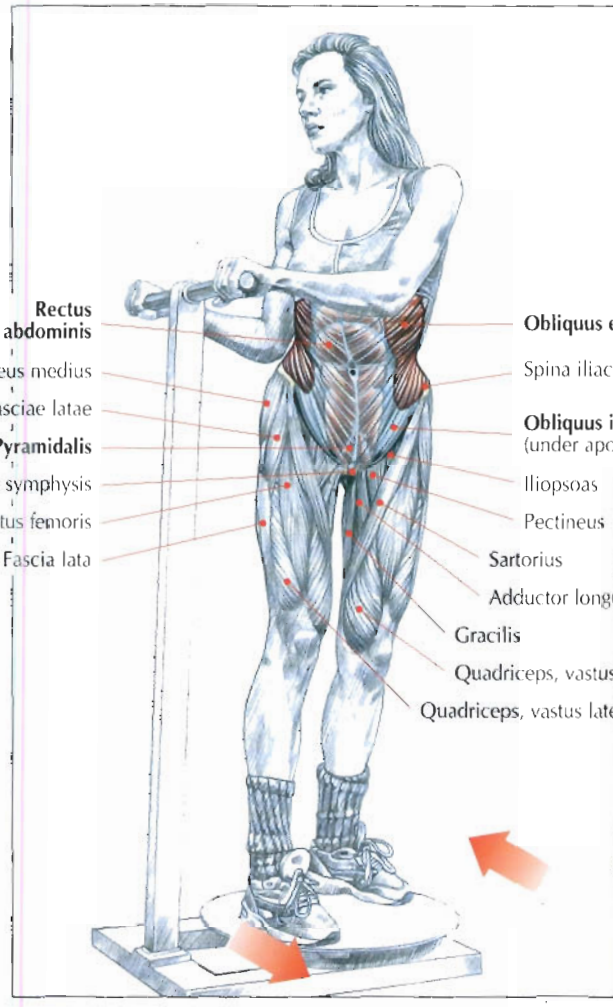
Using a Roman chair, position your hip on the support pad. Hook your feet under the roller pads. Place your hands behind your head or across your chest, your upper body slightly above horizontal:
– Lift and twist your upper body upward
– Continue on the same side for one set, then alternate sides.

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 contracting isometrically to prevent your torso from going below the horizontal plane.

Note: this movement continuously works the quadratus lumborum.

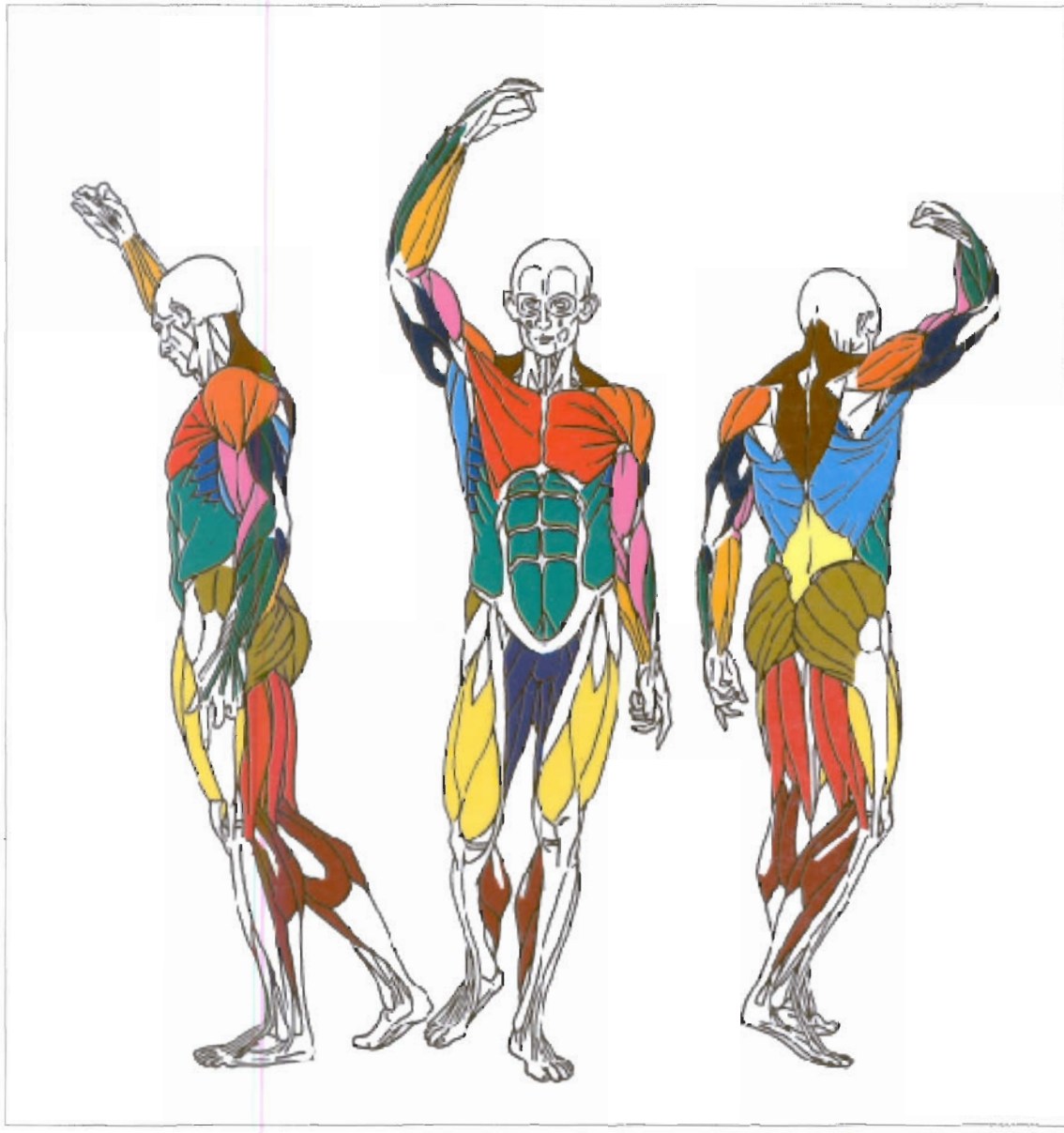
15 MACHINE TRUNK ROTATIONS





Stand on the swivel plate and hold the handles:
– Twist your hips from one side to the other being sure to keep your shoulders stationary throughout the movement
– Bend your knees slightly, making sure you perform this 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.



MAIN MUSCLE GROUPS

- Abdominals
- Adductors
- Dorsal muscles
- Shoulders
- Arm extensors
- Wrist extensors
- Gluteals
- Arm flexors
- Wrist flexors
- Scapulae fixers
- Thigh flexors
- Lumbar muscles
- Surae
- Pectorals
- Quadriceps
- Trapezii

abdomen—The part of the body between the thorax and the pelvis.

abduction—The action of taking away or moving a limb away from the midline of the body.

abnormal curvature of the spine—See lordosis and kyphosis.

acetabulum—The cup-shaped socket in the hipbone.

Achilles tendon—The strong tendon joining the muscles in the calf of the leg to the bone of the heel.

adduction—The action of drawing toward, when a limb moves toward the midline of the body.

amphiarthrosis—A condition that allows limited motion.

anatomy—A branch of morphology that deals with the structure of organisms (see morphology).

aponeurosis—Any of the thicker and denser of the deep fasciae that cover, invest, and form the terminations and attachments of various muscles and differ from tendons in being broad, flat, and thin.

apophysis—A visible projecting part of a bone.

benches—A wide variety of exercise benches available for use in doing barbell and dumbbell exercises either lying or seated on a bench.

biomechanics—The scientific study of body positions, or form, in sport. In bodybuilding, biomechanics studies body form when exercising with weights.

brachial (from Latin *brachium*, "arm")—Of or relating to the arm.

capsule (from Latin *capsula*, "small box")—A membrane or sac enclosing a body part.

cardiovascular—Of, relating to, or involving the heart and blood vessels.

cartilage—A translucent elastic tissue that composes most of the skeleton.

coccyx (from Greek *kokkyx*, "cuckoo")—The end of the spinal column beyond the sacrum (see sacrum)

concentric muscular action—A type of muscular contraction characterized by tension being developed while the muscle is shortening (e.g., the upward phase of a biceps curl).

condyle (from Greek *condylus*, "knuckle")—An articular prominence of a bone.

coracoid (from Greek *korax*, "raven")—Of, relating to, or being a process of the scapula or a well-developed cartilage bone that extends from the scapula to or toward the sternum.

coracoid apophysis—An expanded part of the upper edges of the scapula.

coxal—Of or relating to the hip.

crunch—Type of exercise that works the abdominals.

dipping bars—Parallel bars set high enough above the floor to allow you to dip between them, perfom leg raises for your abdominals, and perform a variety of other exercises.

epicondyle—Apophysis of the upper extremity of the humerus (see apophysis).

fascia (from Latin *fascia*, "band, bandage")—A sheet of connective tissue covering or binding together body structures.

fascicle—A bundle of anatomical fibers.

femur (from Latin *femur*, "thigh")—The proximal bone of the hind or lower limb.

good morning—Type of exercise that involves bending forward at the waist.

hip—The laterally projecting region of each side of the lower or posterior part of the trunk formed by the lateral parts of the pelvis and the upper part of the femur together with the fleshy parts covering them.

humerus (from Latin *humerus*, "shoulder")—The long bone of the upper arm extending from the shoulder to the elbow.

iliopsoas—The two muscles that flex the thigh; specifically, the psoas major and the iliacus.

Ilium—The dorsal, upper, and largest of the three bones composing either lateral half of the pelvis.

insertion—The part of a muscle or ligament that inserts on a bone.

intervertebral disk—Any of the tough elastic disks that are interposed between the centra of adjoining vertebrae (see slipped disk).

isometrics—Exercise or system of exercises in which opposing muscles are so contracted that there is little shortening but great increase in tone of muscle fibers involved.

jerk—The pushing of a weight from shoulder height to an overhead position in weight lifting (see snatch).

joint—Any one of the connections between bones. Joints are classified according to structure and moveability as:
- synovial (freely moveable)
- cartilaginous (slightly moveable)
- fibrous (immovable)

kyphosis—Abnormal backward curvature of the upper spine (see lordosis).

ligament (from Latin *ligamentum*, "band, tie")—Dense connective tissue that attaches two articulating surfaces of bone together.

lobe—A rounded projection or divsion of a bodily organ (example: mammary lobe).

lordosis—Abnormal curvature of the spine forward (see kyphosis).

lumbago—Usually painful muscular rheumatism involving the lumbar region.

morphology (word created by Goethe)—A branch of biology that deals with the form and structure of an organism.

multipennate—Arranged like the barbs of a feather.

muscle fibers—The muscles of the skeleton are formed by very long and thin contractile muscle fibers. They are attached to:
- a bone,
- a tendon, or
- an aponeurosis.

negative exercise—A form of exercise in which the muscle lengthens rather than shortens during muscular tension. An example can be seen in an exercise when an individual slowly lowers the arm. Also called eccentric exercise.

Newton's three laws of motion—
1. Every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it.
2. The relationship between an object's mass (m), its acceleration (a), and the applied force (F) is F = ma. Acceleration and force vector are the same as the direction of the acceleration vector.

3. For every action there is an equal and opposite reaction.

occiput—The back part of the head or skull.

pectoral girdle—The bony or cartilaginous arch that supports the forelimbs.

pronation (from Latin *pronare*, "to bend forward")—
1. Rotation of the arm and forearm so that the palm faces backward or downward.
2. Pronated grip: grasping the bar so the palms face down and the thumbs face each other. Also called an overhand grip.

protraction—The forward tilt of an organ.

psoas major—Flexes and rotates the thigh sideways and flexes the spine. Originates at the lower six vertebrae with insertion at the femur (small trochanter) via a tendon in common with the iliacus.

pubic symphysis—Immovable articulation (amphiarthrosis) of the upper hip bone. (It becomes movable to give birth).

pubis—The ventral and anterior of the three principal bones composing either half of the pelvis (see ilium and pubic symphisis).

radius (from Latin *radius*, "ray")—The bone on the thumb side of the forearm (see ulna).

retroversion—The bending backward of a body part.

sacrum (from Latin *sacrum*, "holy bone")—The part of the vertebral column that is directly connected with or forms a part of the pelvis and consists of five united vertebrae.

scapula—Either of a pair of large triangular bones lying one in each dorsal-lateral part of the thorax, being the principal bone of the corresponding half of the pectoral girdle and articulating with the corresponding clavicle or coracoid. Also called shoulder blade.

scapular—Of or relating to the shoulder or the scapula (see scapula).

sciatic (from Greek *iskhion*, "hip")—
1. sciatic nerve—either of the pair of largest nerves in the body that arise one on each side from the nerve plexus supplying the posterior limb and pelvic region and that pass out of the pelvis and down the back of the thigh.
2. sciatica—pain along the course of a sciatic nerve especially in the back of the thigh; broadly, pain in the lower back, buttocks, hips, or adjacent parts.

shoulder—The laterally projecting part of the human body formed of the bones and joints by which the arm is connected with the trunk and the muscles covering them.

slipped disk—A protrusion of one of the cartilage disks between vertebrae with pressure on spinal nerves resulting in 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 jerk).

spinal (from Latin *spina*, "thorn")—
1. Of, relating to, or situated near the backbone.
2. Of, relating to, or affecting the spinal cord.

squat rack—Standards used to hold a barbell at shoulder height; typically used in placing the bar on the back for the squat exercise.

sternum—A compound ventral bone that connects the ribs or the shoulder girdle or both and consists of the manubrium, gladiolus, and xiphoid process. Also termed breastbone.

supination—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 backward or on the back")—A muscle that produces the motion of supination.

symphysis—An immovable or more or less movable articulation of various bones in the median plane of the body (see joint).

synovial membrane—Membrane covering the inner side of movable articulations or diarthroses. It contains a fluid called synovia.

tendon—A tough cord or band 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 extrinsic agent.

trochanter (from Greek *trochanter*, "to run")—A rough prominence at the upper part of the femur.

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

vertebrae—The 33 or 34 bony or cartilaginous segments composing the spinal column (7 cervical vertebrae, 12 thoracic vertebrae, 5 lumbar vertebrae, 5 sacral vertebrae forming the sacrum, and 4 or 3 coccygeal vertebrae forming the coccyx).

vital capacity—The breathing capacity of the lungs expressed as the volume of air that can be forcibly exhaled after a full inspiration (on average, 3.1 liters in women, 4.3 liters in men).