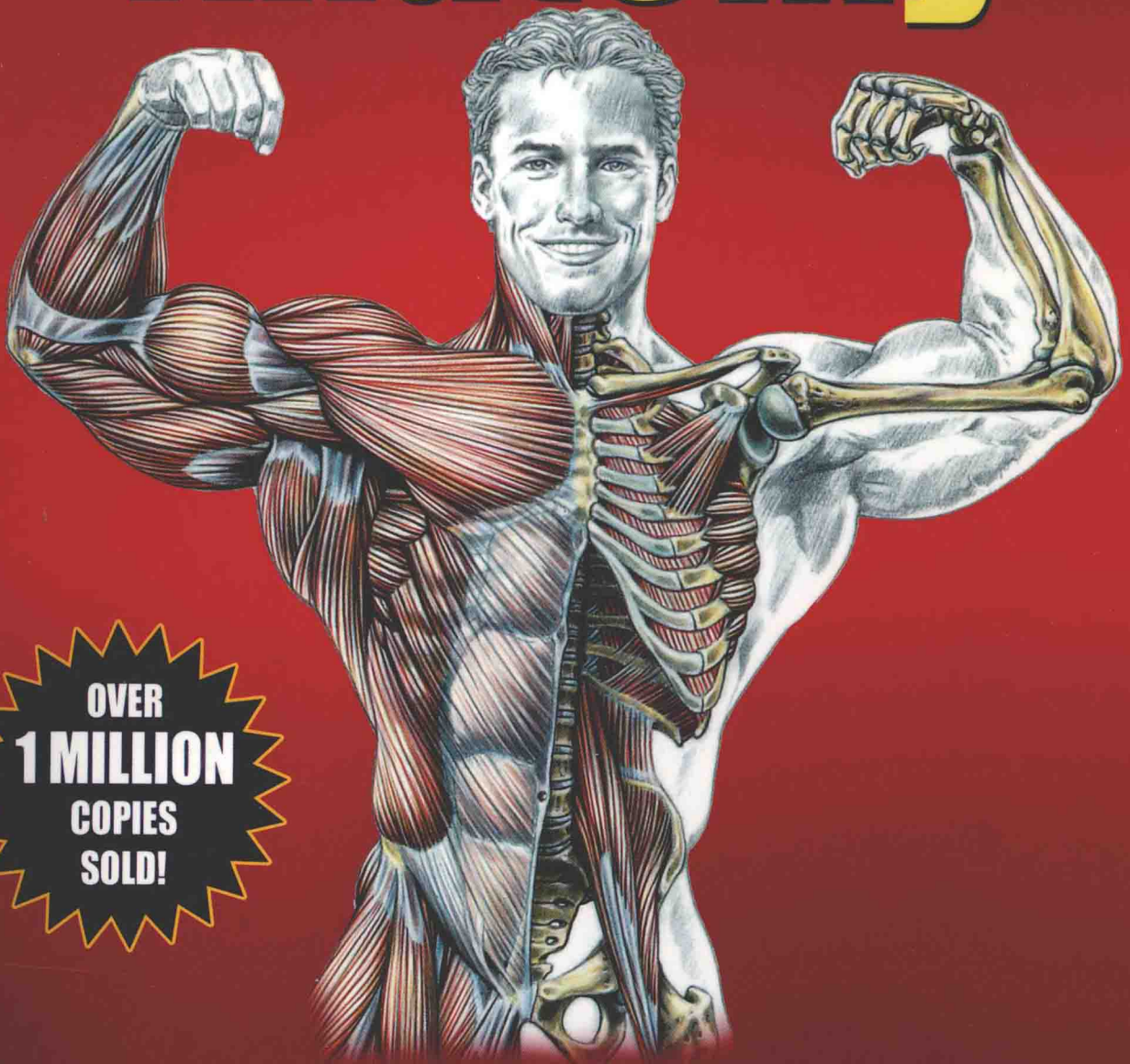


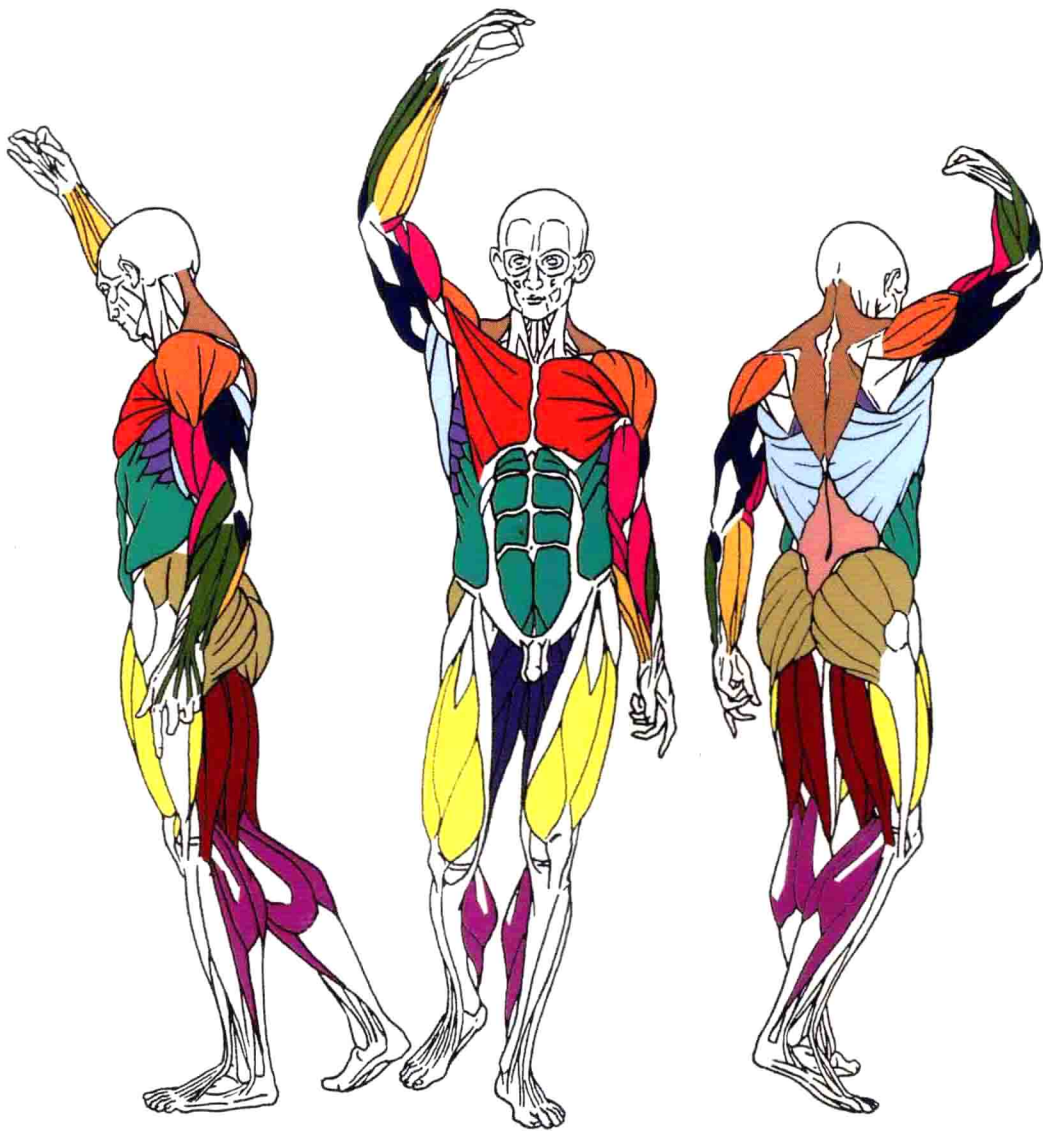
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Strength Training Anatomy



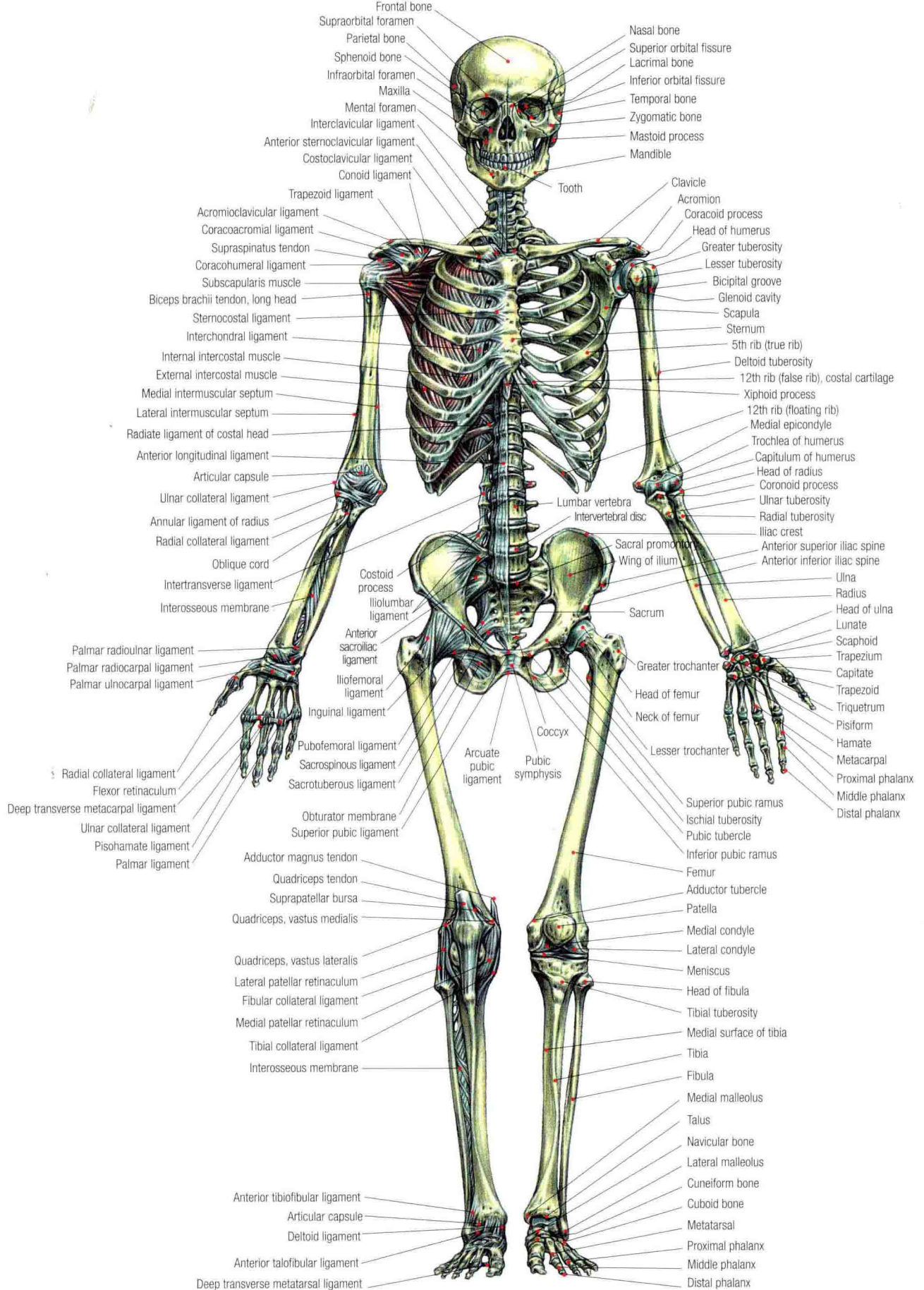
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MAIN MUSCLE GROUPS

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



frédéric delavier

STRENGTH TRAINING ANATOMY

THIRD EDITION



HUMAN KINETICS

For my father

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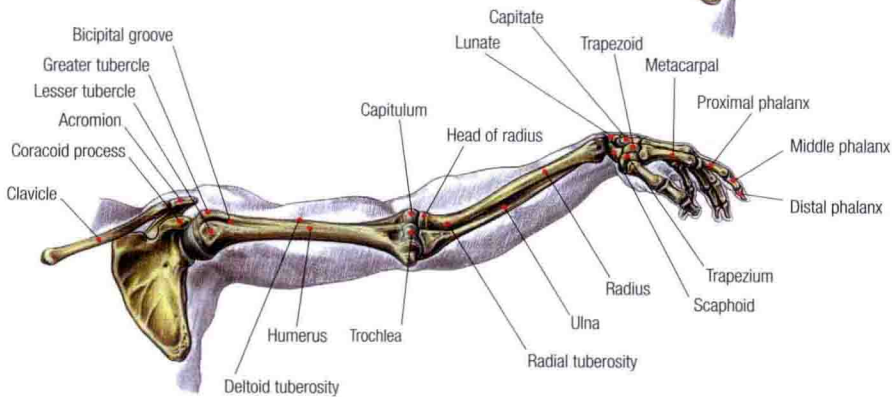
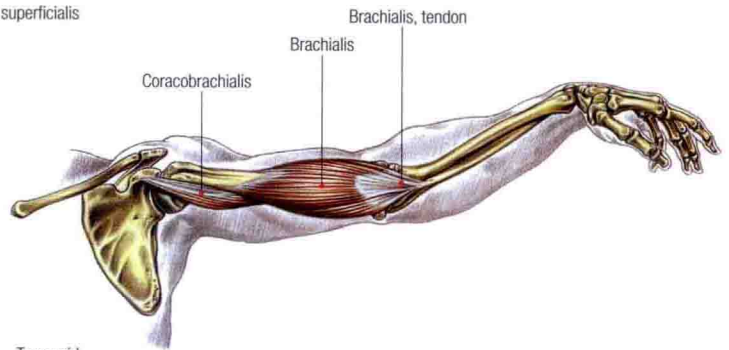
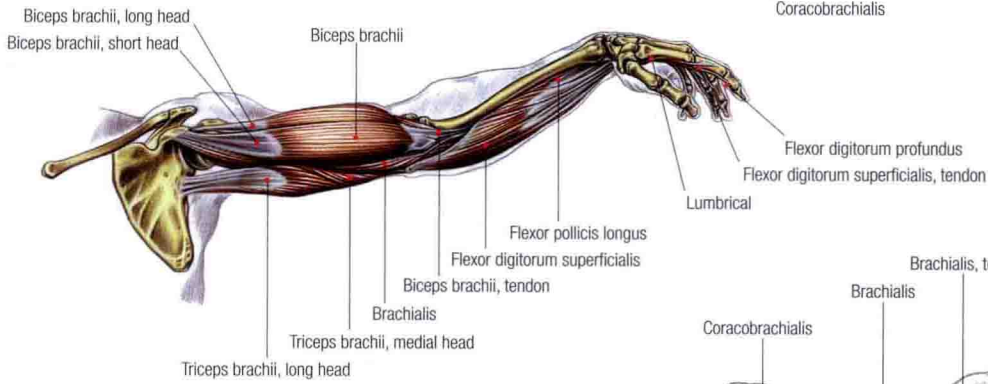
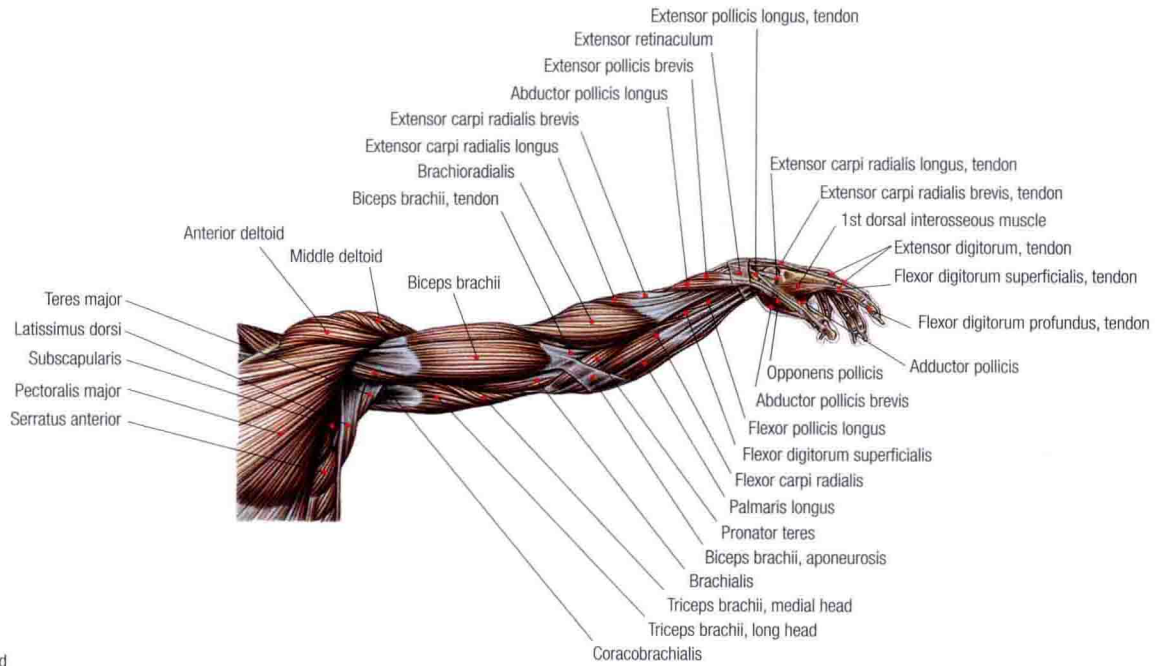
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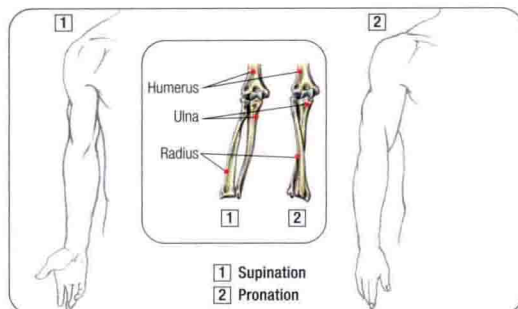
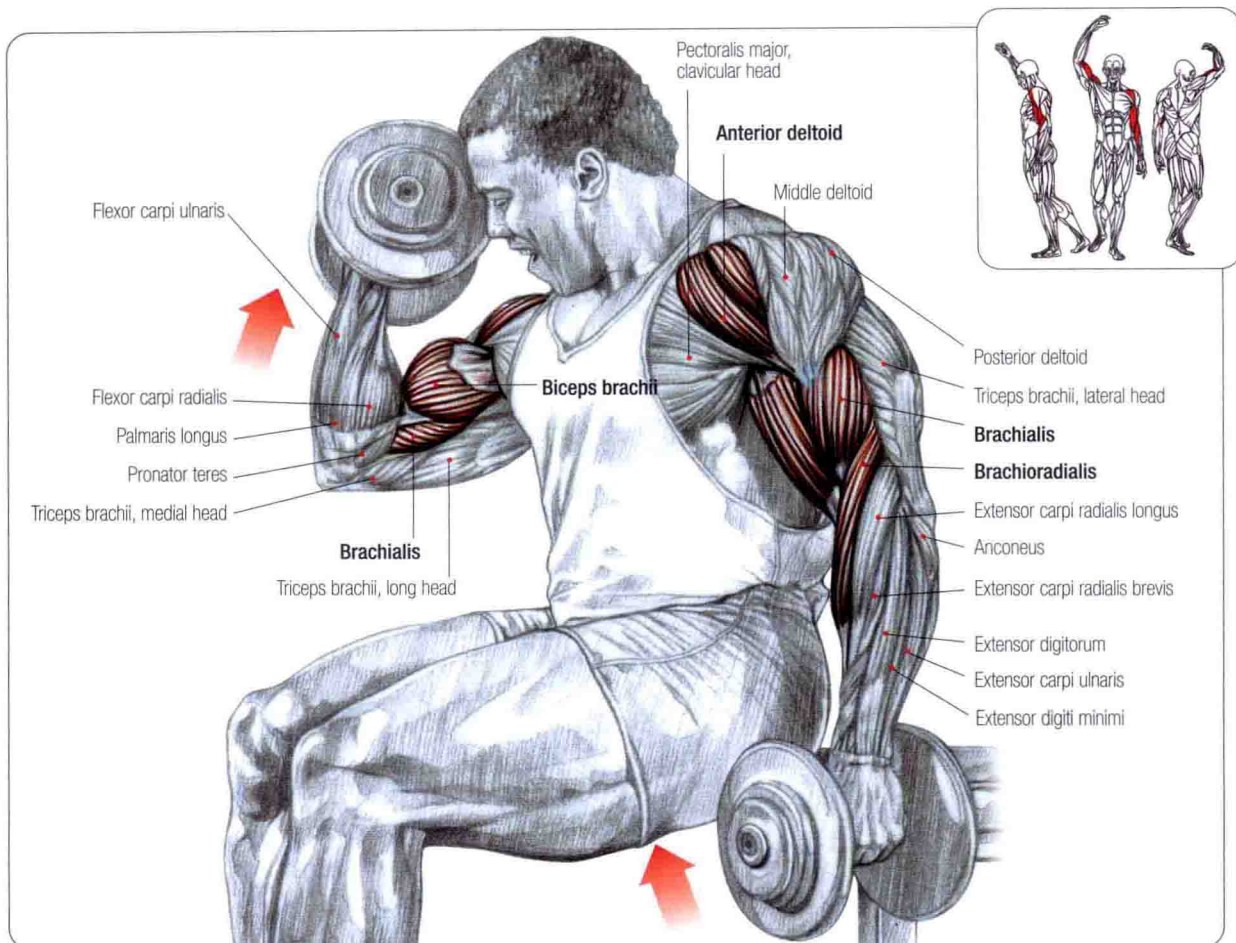
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1

DUMBBELL CURLS

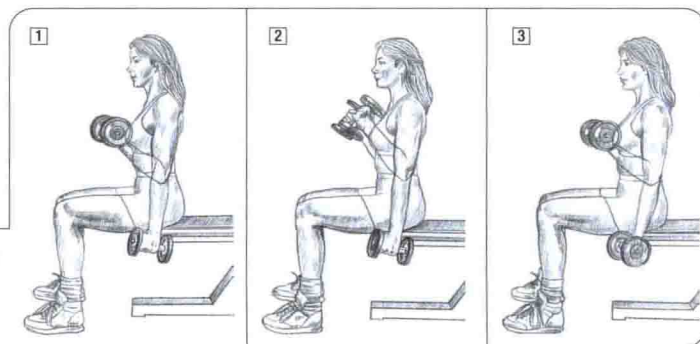


Comment: This exercise takes the biceps through its complete range of motion, which includes flexion, protraction, and supination.

Sit holding a dumbbell in each hand with arms hanging down and the palms of the hands facing the body:

- Inhale and bend the elbow, rotating the palm up before the forearm reaches horizontal.
- Continue by raising the elbow at the end of the movement.

This exercise primarily uses the brachioradialis (long supinator), brachialis, biceps brachii, and anterior deltoid, and, to a lesser extent, the coracobrachialis and clavicular head of the pectoralis major.

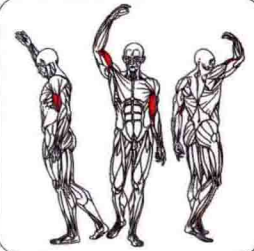
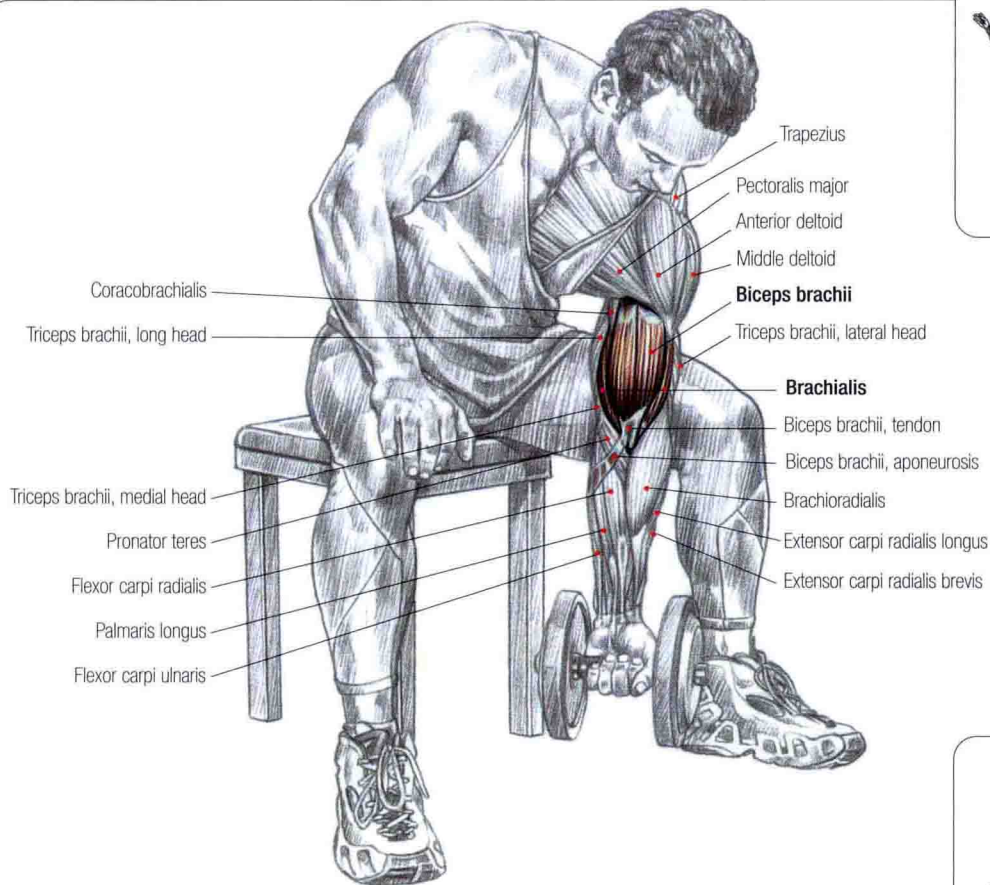


THREE WAYS TO EXECUTE CURLS:

- 1 Emphasize biceps
- 2 Work brachioradialis intensely
- 3 Work mainly biceps and brachialis

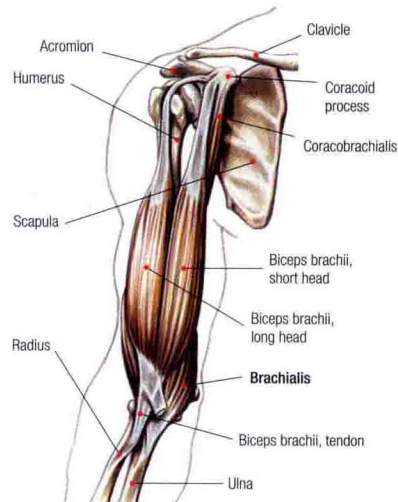
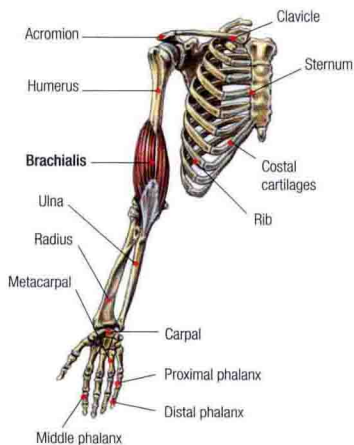
CONCENTRATION CURLS

2



FINAL POSITION

BRACHIALIS MUSCLE



Sit holding a dumbbell with the palm facing forward and the elbow positioned against the inner thigh:

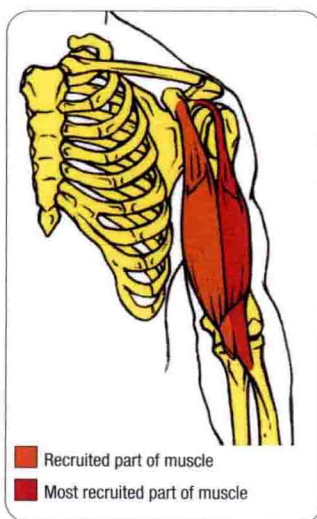
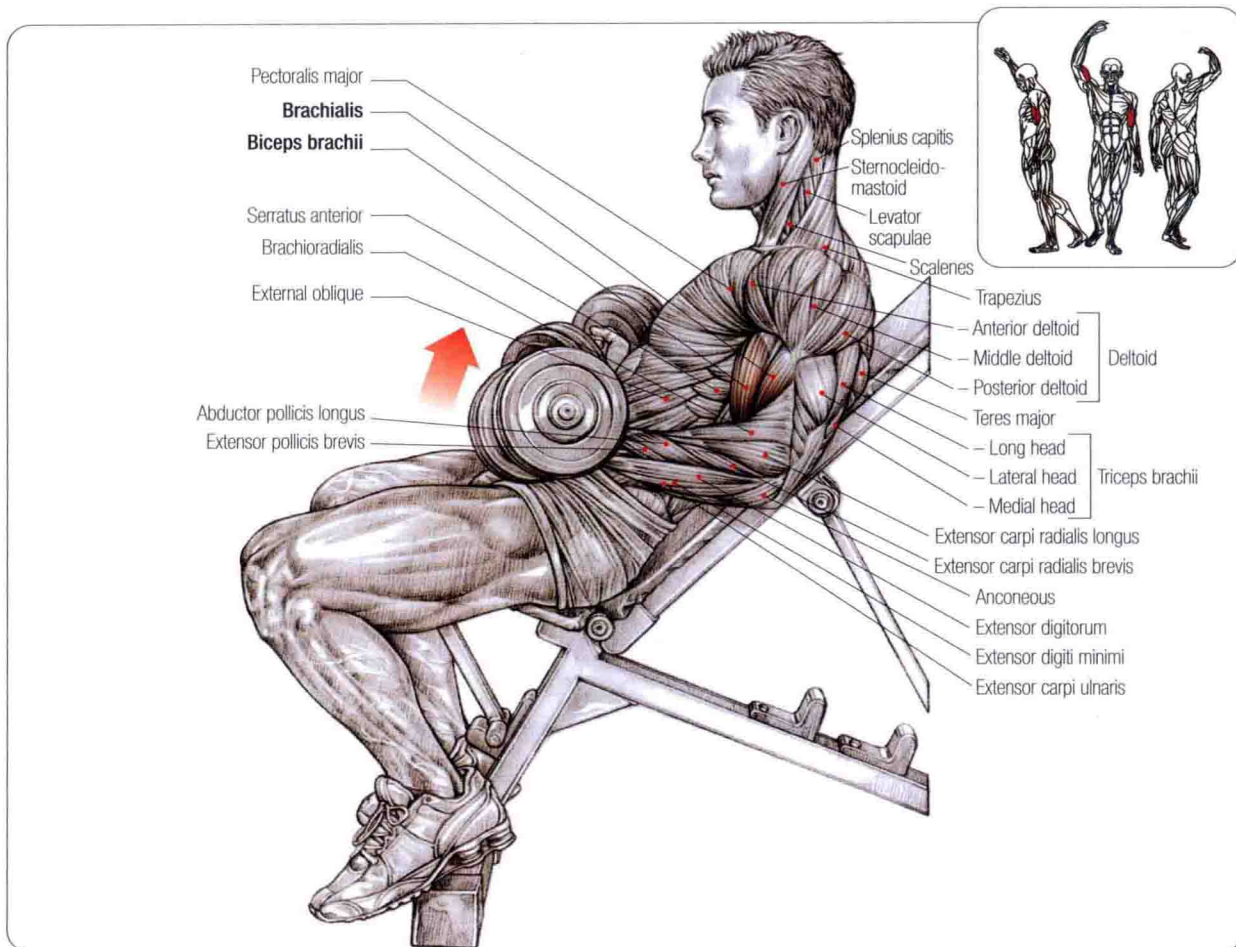
- Inhale and lift the forearm by bending the elbow.
- Exhale at the end of the effort.

This isolation exercise allows you to control the range of motion, speed, and form of the movement.

It mainly works the biceps brachii and brachialis.

3

INCLINE DUMBBELL CURLS



Sit on an incline bench with your back leaning against the support. In each hand, hold a dumbbell with a relaxed over-hand grip (thumbs face to the inside):

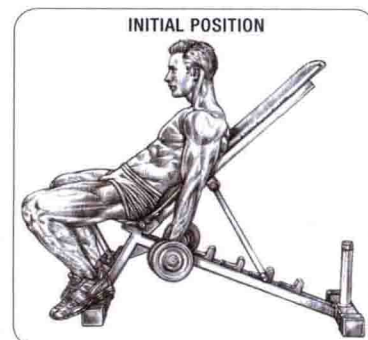
- Inhale and bend your elbows while externally rotating your wrists before your forearms reach horizontal so that at the end of the movement your hands are in an underhand grip (thumbs face to the outside).
- Exhale at the end of the movement.

This exercise targets the long head of the biceps (the lateral part of the muscle), which is stretched at the beginning of flexion of the elbow. This movement also works the brachioradialis and the brachialis.

Variations: Use alternating forearm curls. Increase the intensity of the effort by initiating the movement in an underhand grip.



Attention: Adjust the angle of the bench according to individual variations in shoulder flexibility. If the arm is too far back, the long head of the biceps will create excessive friction in the bicipital groove of the humerus and will strain the tendon.

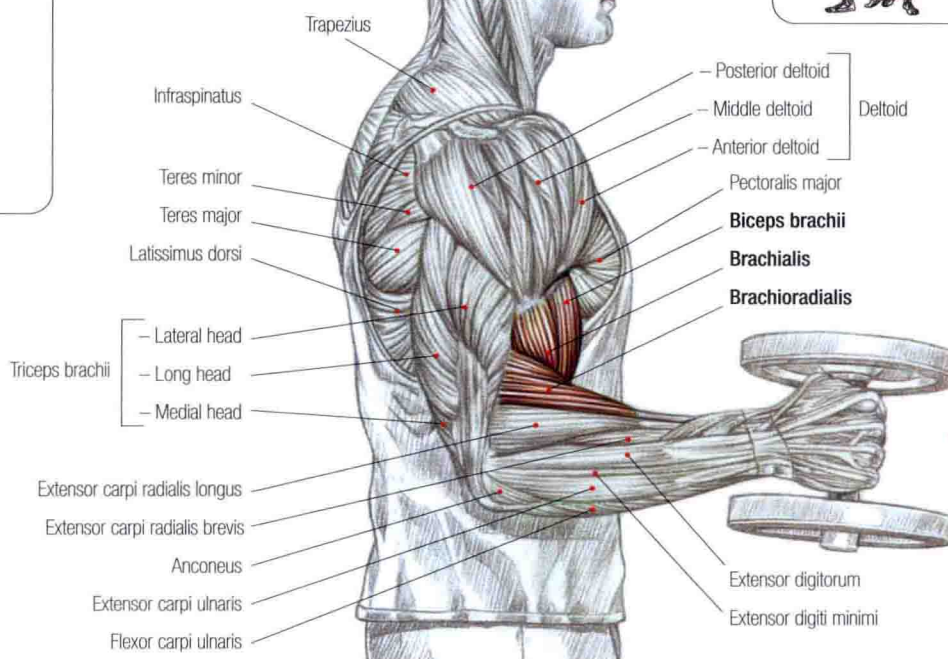
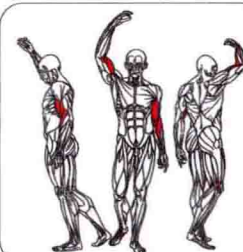


HAMMER CURLS

4



THE MOVEMENT

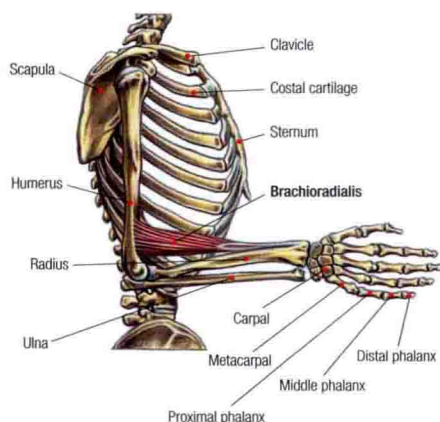
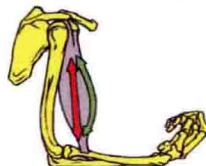


Stand or sit gripping a dumbbell in each hand with the palms facing each other:

- Inhale and raise the forearms together or alternately.
- Exhale at the end of the movement.

This is the best exercise for developing the brachioradialis. It also develops the biceps brachii, brachialis, and, to a lesser degree, the extensor carpi radialis brevis and longus.

BRACHIORADIALIS MUSCLE

DISTRIBUTION OF THE MUSCLE FIBERS
ACCORDING TO THEIR SPECIFIC ACTIONS

- Deep muscle fibers in the most direct path: most frequently recruited.
- Superficial muscle fibers: recruited as intensity of effort increases.

THE LAW OF LEAST EFFORT

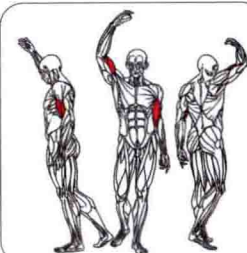
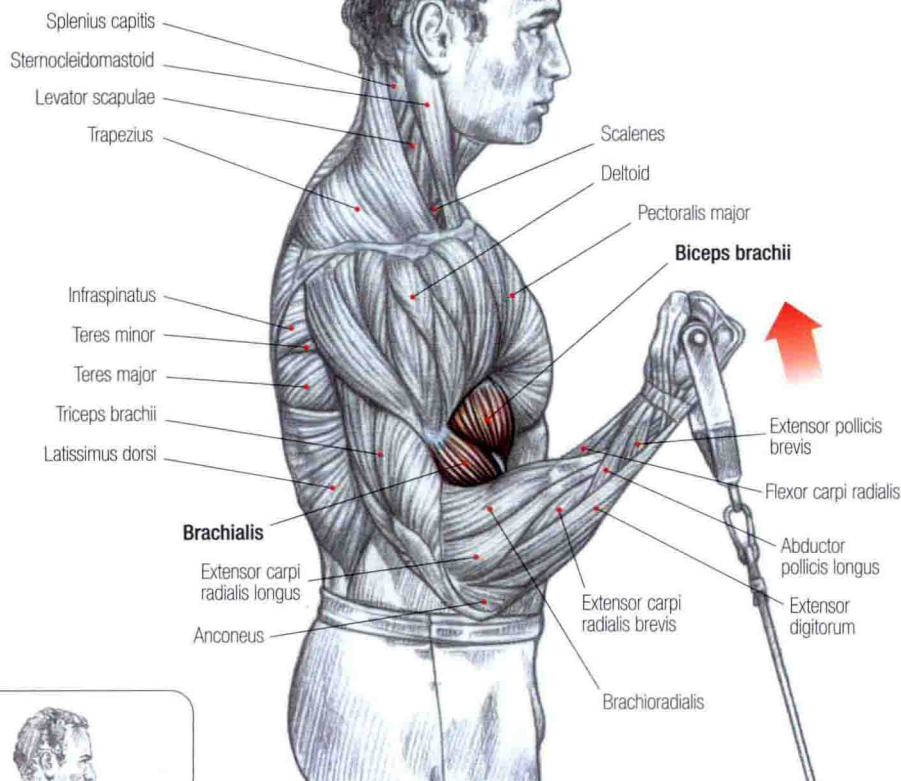
To minimize effort when performing an action, the muscle will first recruit the fibers in the most direct path (that is, the most linear path located deep in the muscle).

A common belief is that the greater the force, the more the deep part of the muscle is worked. But in reality, the more the intensity of effort increases, the more the superficial muscles will be recruited to perform the movement.

Furthermore, the deep and linear muscles are generally slower to contract but more resistant to repetitive movements than the lateral, more curved, and longer muscles.

5

LOW-PULLEY CURLS



VARIATION
TWO-HANDED LOW-PULLEY CURLS



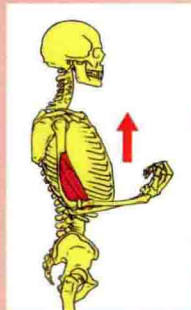
THE MOVEMENT

Stand facing the machine. Grasp the handle with an underhand grip (palm facing up):

- Inhale and bend the elbow to raise the forearm.
- Exhale at the end of the movement.

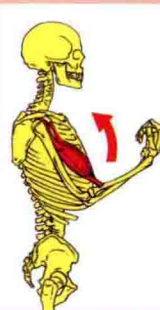
This exercise focuses the effort on the biceps brachii and works the muscle intensely.

MONOARTICULAR MUSCLE AND POLYARTICULAR MUSCLE



BRACHIALIS MUSCLE

The brachialis muscle crosses at only one articulation, the elbow. It is said to be monoarticular. Its simple action mobilizes this joint; it flexes only the forearm.

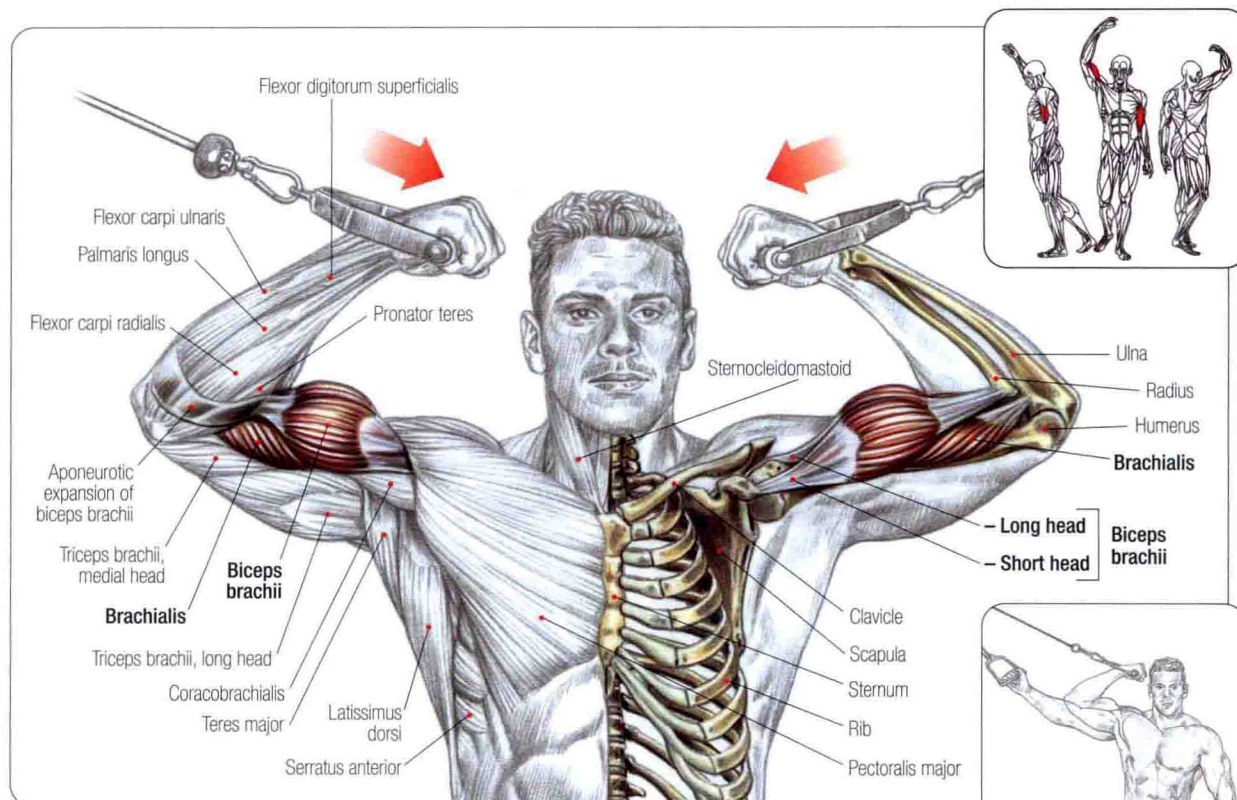


BICEPS BRACHII MUSCLE

The biceps brachii muscle crosses over at more than one articulation, that of the elbow and shoulder. It is said to be polyarticular. That is, it mobilizes more than one joint, and its action is complex. The biceps brachii can bend the elbow, raise the elbow, bring the arm to the thorax, and place the forearm into supination (underhand grip).

HIGH-PULLEY CURLS

6



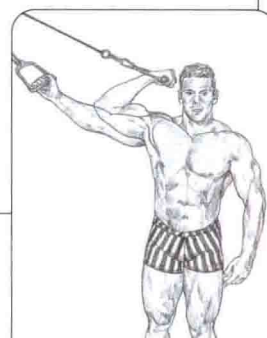
Stand between the pulleys with the arms outstretched in a "cross" and grasp the handles of the high pulleys with an underhand grip:

- Inhale and bend the elbows to bring the hands toward the body. Exhale at the end of the movement.

This exercise, which is most often performed as a cool-down at the end of an arm session, focuses the work on the short head of the biceps brachii, which has been stretched and put under tension in the "cross" start-up position.

This exercise also contracts the monoarticular brachialis elbow flexor.

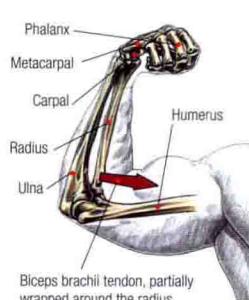
Perform this exercise with light weights so that you can concentrate and feel the contraction at the inside of the biceps brachii. Sets of high reps provide the best results.



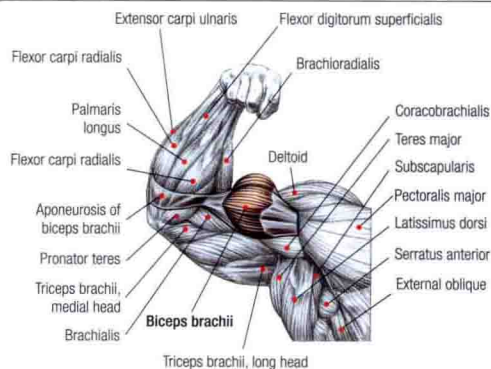
VARIATION
ONE-HANDED EXECUTION



When the hand is pronated, the distal tendon of the biceps brachii muscle is partially wrapped around the radius.



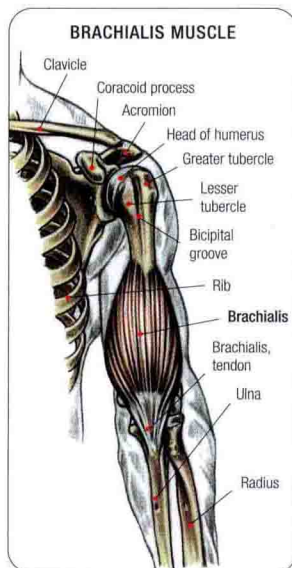
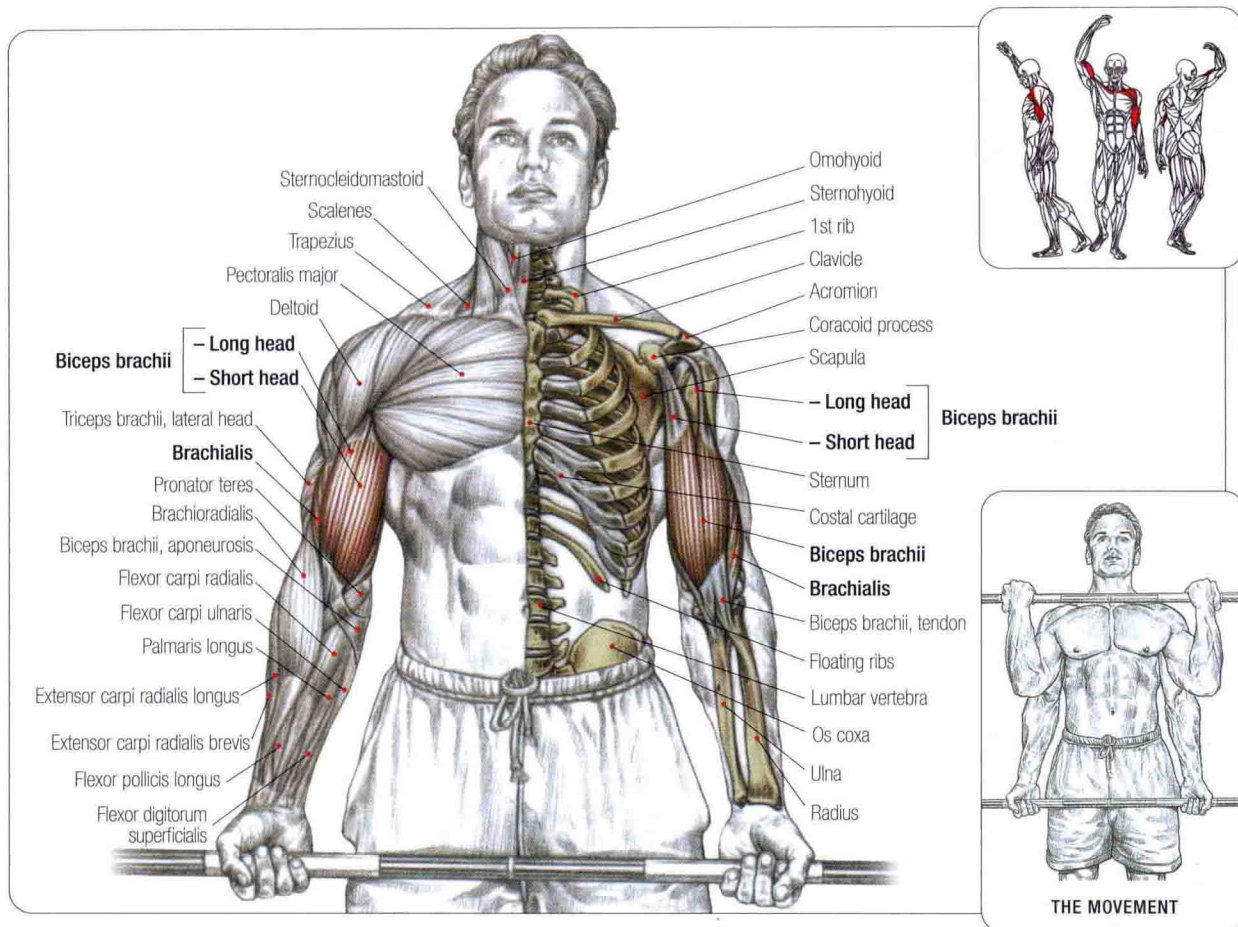
When the biceps brachii contracts, the force placed on its distal tendon causes the radius to pivot on its axis, bringing the hand into supination.



Comment: In addition to its role as a forearm flexor, the biceps brachii is the most powerful supinator.

7

BARBELL CURLS



Stand with the back straight. Grasp the barbell with an underhand grip and hands slightly wider than shoulder-width apart:

- Inhale and raise the barbell by bending the elbows, taking care to stabilize the torso and spine by isometrically contracting the gluteal muscles, abdominal muscles, and spinal muscles.
- Exhale at the end of the movement.

This exercise mainly contracts the biceps brachii, brachialis, and, to a lesser degree, the brachioradialis, pronator teres, and the wrist flexor group.

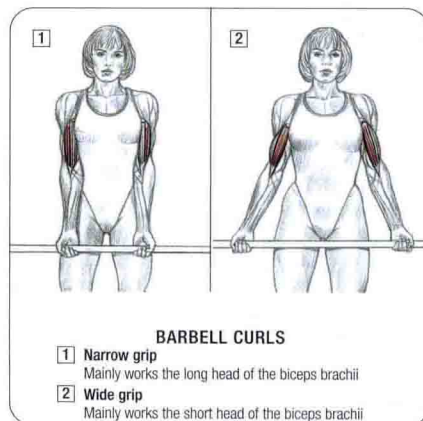
Variations: Vary the width of the grip to work different parts of the muscle more intensely:

- Placing the hands farther apart isolates the short head of the biceps brachii.
- Placing the hands closer together isolates the long head of the biceps brachii.

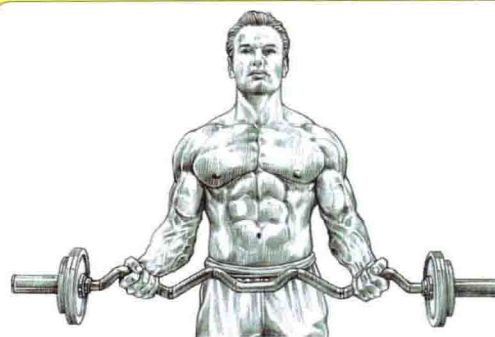
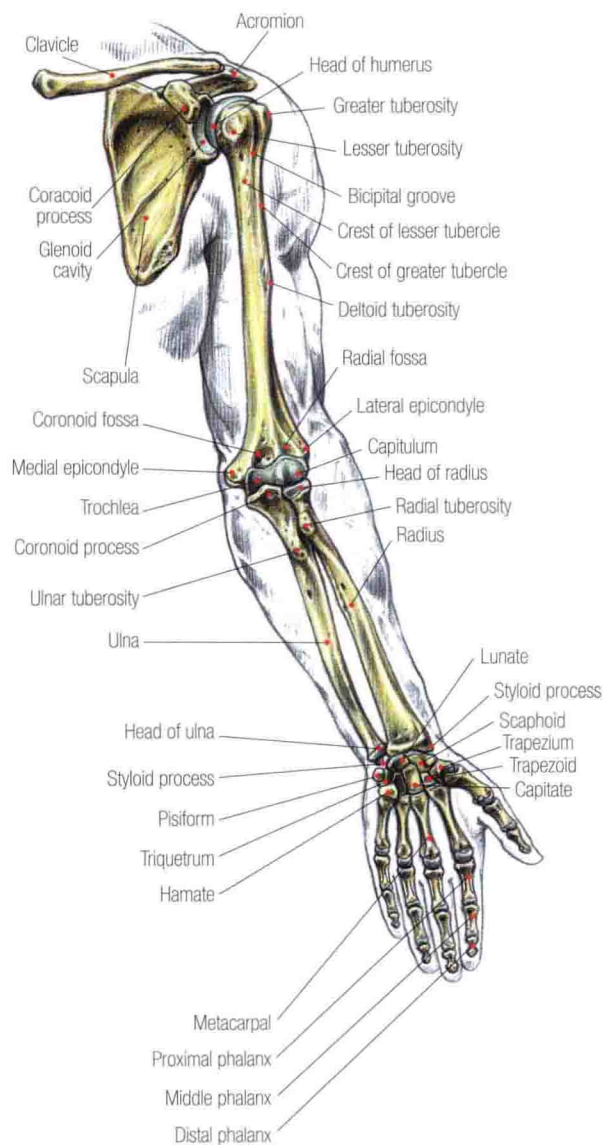
Raising both elbows after they are flexed increases the contraction of the biceps brachii and contracts the anterior deltoid.

To make the exercise more difficult, perform the movement with the back against a wall so that the shoulder blades don't move.

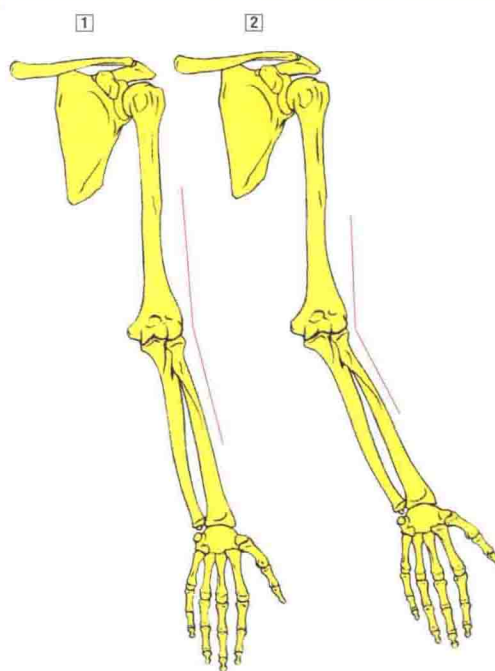
You can lift more weight and gain strength by leaning the torso back while lifting the bar; however, to prevent injury, this requires good technique and well-developed abdominal and lumbar muscles.



ELBOW STRUCTURE AND ITS EFFECT ON TRAINING



Biceps training with an E-Z bar eases excessive wrist tension.



1 Upper extremity with a small angle

2 Upper extremity with a significant valgus angle (more common in women)

When training the biceps brachii using a barbell, take into account variations in each person's physical structure.

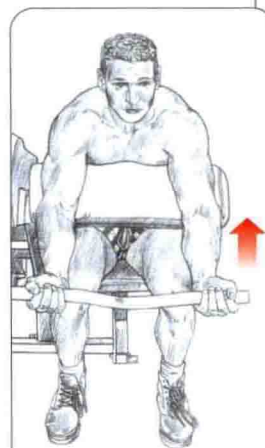
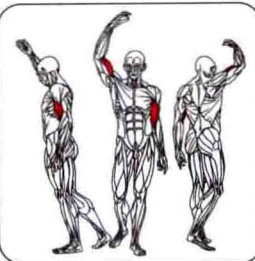
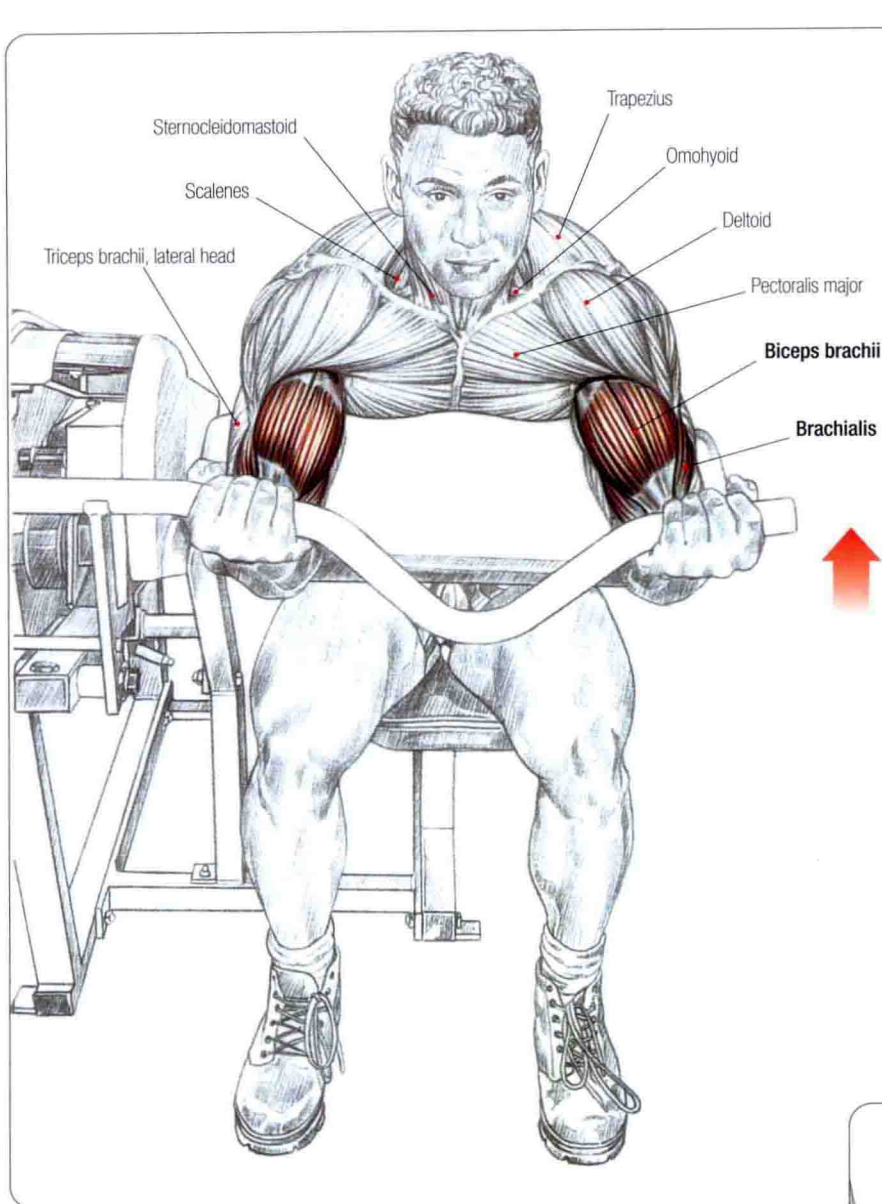
In the anatomical position (arms hanging alongside the body, palms facing forward, and thumbs pointing laterally), the angle at the elbow between the upper arm and

the forearm varies from person to person. Someone whose forearm hangs distinctly away from the body in a valgus position must break excessively at the wrist when performing a curl with a straight bar, which is painful. Therefore, these people should work with an E-Z bar to spare their wrists.

Comment: Valgus of the elbow is usually more pronounced in women.

8

MACHINE CURLS



INITIAL POSITION

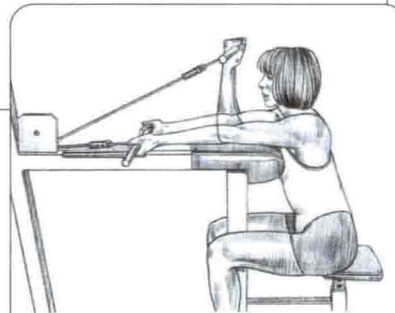
Sit at the machine and grasp the bar with an underhand grip, arms extended and resting on the support:

- Inhale and raise the forearms.
- Exhale at the end of the movement.

This is one of the best exercises for working the biceps brachii. Fixing the arms against the support makes it impossible to "cheat."

At the beginning, the muscle tension is intense, so be sure to warm up properly using light weights. To avoid the risk of tendonitis, do not completely extend the arm.

This movement also works the brachialis and, to a lesser extent, the brachioradialis and pronator teres.



VARIATION

Performing the curl with an Atlas pulley is a great way to pump up the muscle.