

A person in a gym setting, wearing a white long-sleeved shirt and dark shorts, is leaning over a barbell with weights. The person's hands are on the barbell, and they are wearing black athletic shoes. The background shows a gym environment with large windows and a tiled floor.

THE ROLE OF ECCENTRIC EXERCISES IN SPORT INJURIES REHABILITATION

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DICTIONARY

eccentric exercises - ćwiczenia
ekscentryczne

eccentric phase - faza ekscentryczna

endurance - wytrzymałość

refines - udoskonala

tendons - ścięgna

ligaments - więzadła

post-traumatic rehabilitation - rehabilitacja
pourazowa

anterior cruciate ligament - więzadło
krzyżowe przednie

squats - przysiady

Achilles tendinopathy - tendinopatia
ścięgna achillesa (stan zapalny)

increase - zwiększać

rotator cone - stożek rotatorów

stiffness - sztywność

power output - moc wyjściowa

stroke - udar

dumbbells - hantle

paresis - niedowłady

PRESENTATION OUTLINE

- WHAT ARE ECCENTRIC EXERCISES?
- TYPES OF CONTRACTIONS
- BENEFITS OF ECCENTRIC EXERCISES
- EXERCISES AFTER ACL RECONSTRUCTION
- ECCENTRIC EXERCISES IN ACHILLES TENDON REHABILITATION
- ECCENTRIC EXERCISES FOR THE SHOULDER
- QUIZ

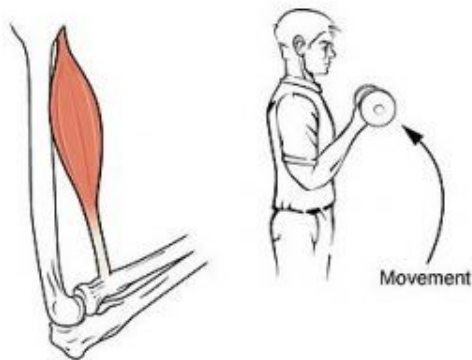
WHAT ARE ECCENTRIC EXERCISES?

Eccentric movements positively improve neuromuscular coordination, better control of movement and its efficiency. They better develop strength, increase the endurance of muscles and tendons, which reduces the risk of injury, although muscle injuries occur most often in this phase. The more dynamic the exercise is performed, the greater the risk of injury.

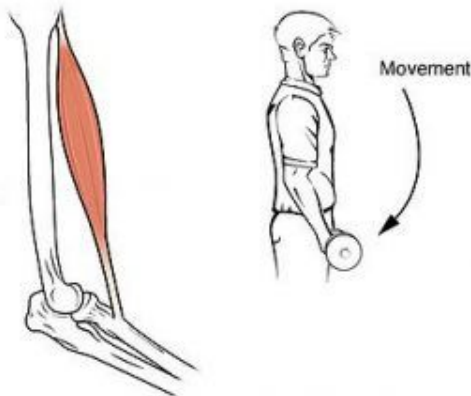


TYPES OF CONTRACTIONS

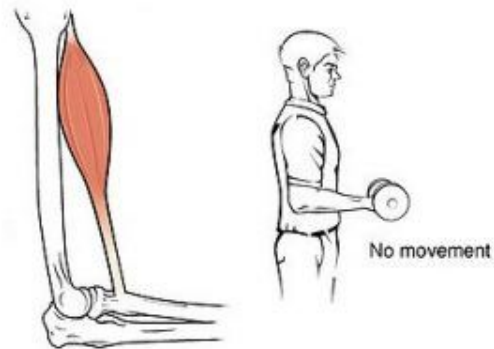
We speak of the eccentric phase when the loaded muscle lengthens (the muscle attachments move away from each other).



CONCENTRIC
(shortening)



ECCENTRIC
(lengthening)



ISOMETRIC
(no movement)

BENEFITS OF ECCENTRIC EXERCISES

- Improves and refines the technique of the exercise performed
- Strengthens tendons and ligaments
- Increases muscle endurance
- Improves range of mobility
- Has a positive effect on the nervous system
- In the eccentric phase, the muscle can work under a load 10-60% higher than the maximum load in the concentric phase.
- Eccentric training is a great substitute for classic static stretching.

A physical therapist in a black t-shirt is assisting a patient lying on a table. The therapist is holding the patient's right leg, which is bent at the knee, and appears to be performing a manual therapy or exercise. The patient is wearing grey shorts. The background shows a modern gym or clinic with large windows and circular pendant lights.

EXERCISES AFTER ACL RECONSTRUCTION

Eccentric exercises produce quick results and are often used in post-traumatic rehabilitation of, for example, the anterior cruciate ligament of the knee.

Eccentric squats - slow down the lowering phase of the squat to apply an overload stimulus that can be used to treat knee tendon pain, increase lower limb stiffness and improve power output.



<https://www.docteur-fitness.com/wp-content/uploads/2022/04/squat-saute-exercice-musclation-jambes.gif>

Another eccentric exercise can be the single-leg squat. In this exercise we strengthen front and back of the thigh and also glutes and body. We lift one leg and then perform a squat on the other leg.

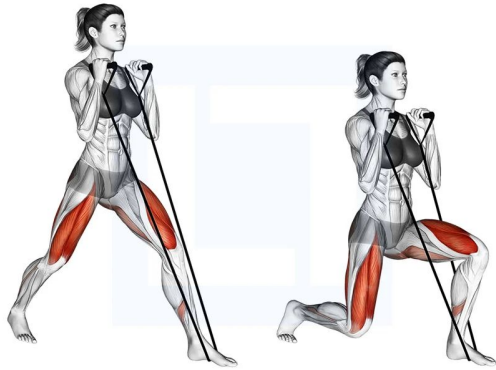


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Examples of other exercises



<https://www.sfd.pl/SFD/articles/main/2024/1/16/bigec183dcadc784b7e9587dc19130ef0da.jpg>



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A person is shown from the waist down, crouching on a dirt trail. They are wearing dark athletic shorts and black sneakers. Their right hand is holding their right ankle, and their left hand is also near the ankle, suggesting they are in pain or examining an injury. The background is a blurred natural setting with hills and trees.

ECCENTRIC EXERCISES FOR ACHILLES TENDON REHABILITATION

Performing eccentric exercises for 12 weeks in the treatment of Achilles tendinopathy has been proven to increase collagen protein synthesis in the damaged tendon by several times.

https://sprint-rowery.pl/media/wysiwyg/Blog/HBGR/zapalenie-_ci_gna-achillesa-5.jpeg

Exercises can be performed with body weight

These exercises, strengthen and stretch the calf muscles, provide stability, increase mobility of the ankle joint.



<http://www.leksykonmasazu.pl/slowko/skurcz-ekscentryczny/2438>



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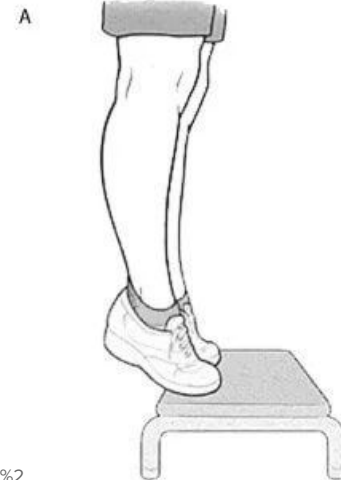
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A



B



B



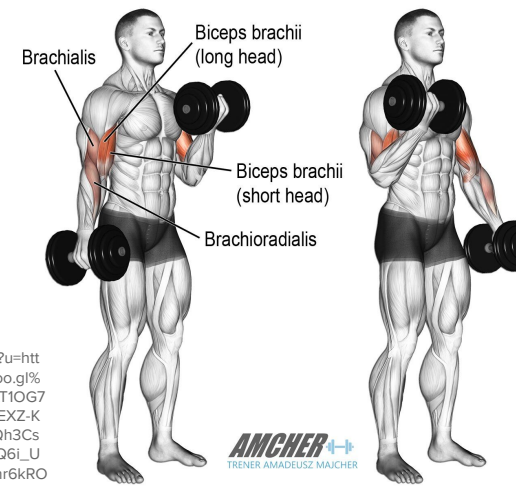
<https://www.sport-med.pl/sites/default/files/images/achilles.cwiczenie.1.JPG>

ECENTRIC EXERCISES FOR THE SHOULDER



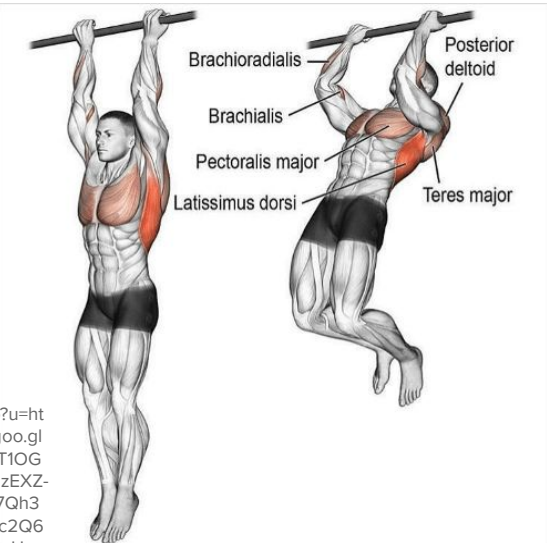
The volume of research is certainly much smaller for shoulder disorders. However, many clinicians and researchers agree that eccentric shoulder exercises can play an important role in the treatment of rotator cone tendon disorders.

An example of eccentric training can be an exercise for the biceps muscle. In this exercise, we bend the arm at the elbow joint with a load.



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Pull up's on a bar is an exercise using one's own body weight. It works muscles on the back and arms and also improves stabilization of core muscles.



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QUIZ

Eccentric contraction

- a) Gives away muscle attachment
- b) Brings the muscle attachments closer
- c) Distance doesn't change

Eccentric exercises are performed after

- a) Stroke
- b) ACL reconstruction
- c) Paresis

Additional loads (e.g., dumbbells) are required when performing the exercises.

- a) Yes
- b) No



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Thank You for Your attention!



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