

Leg Extensions Machine

The leg extensions is an "open chain kinetic OCK" exercise (the leg is not anchored to the ground), which is different from a "closed chain kinetic exercise CCK," such as a squat or lunge where the body part you're exercising is anchored (feet on the ground or a platform). Some fitness experts feel you should only do Closed Chain Exercises because they are more Functional. This is short sighted. You need to do a combination of exercises to strengthen yourself completely. The leg extension done correctly with good form is a great conditioning and therapeutic exercise.

Performance: Strengthen with 10+ repetitions for 1-3 x sets. **FORM:** In a seated position line up your knee to the axis of the leg extension machine. Make sure the padded portion of the leg roller is against the in-step. Make sure that the back pad is pressed against back. Always keep back in neutral (slight curve to low back) and shoulder back and head up. Place your hands on the hand bars. Lift the weight while exhaling until your legs are almost straight. Do not lock your knees. Do not arch your back or let buttocks come off seat. Exhale and lower the weight back to starting position -SLOWER THAN WHEN EXTENDING. Do not let weights stack touch. In other word keep tension on the muscle and repeat. **DO NOT LET MOMENTUM DRIVE THE MOTION.**

The National Strength and Conditioning Association states that the knee extension has been on the receiving end of heavy criticism by personal trainers and strength and conditioning coaches. The concern centers on the forces that are placed upon structures within the knee during its execution including the anterior cruciate ligament (ACL) and patellofemoral joint (PFJ). This is not the case. ACL forces during the knee extension are less than or equal to many other functional" tasks, such as walking or landing. The tensile forces experienced by the ACL during the knee extension (158 – 396 N, using loads ranging from a dynamic 12 repetition-maximum to a maximum voluntary isometric effort) are less than one-fifth of its ultimate strength. **Therefore, knee extensions do not appear to be any more unsafe for the ACL than tasks like walking.** The recommendation of the squat being a safer exercise for knee ligament health is also logically inconsistent. For example, one study suggests that posterior cruciate ligament (ACL and PCL) forces in the squat are about ten-times greater than those placed on the ACL during the knee extension. Bodyweight squats to 90° knee flexion elicit greater peak PFJ stress than EMG amplitude-matched knee extensions, especially with greater knee flexion. **THEREFORE LEG EXTENSIONS ARE AS SAFE AS SQUATS. THAT IS WHY WE RECOMMEND THEM. THEY ARE GREAT AT BUILDING STRENGTH AND MASS TO THE QUADRICEPS. This is considered a Novice Exercise (see complete list).**

Do it Right!
Exercises you Should Do



SOME SAY DO NOT DO THE LEG PRESSES AND EXTENSIONS ESPECIALLY AFTER INJURY. THIS IS ACTUALLY QUITE WRONG IN MANY CASES. See how leading therapists use the leg extension and leg press in rehabilitation of runners knee and with those with Patella Tendonopathy in this [YouTube Video](#). MOST RECENT studies have shown that OKC exercises (LIKE THE LEG EXTENSION) or OKC plus CKC (LIKE THE LEG PRESS) exercises are more effective than CKC exercises alone in improving quadriceps strength after ACL reconstruction. NEW GUIDANCE IS THAT LEG EXTENSION AND LEG PRESS ARE RECOMMENDED AFTER ACL REPAIR (SEE STUDY). The form when using these machines are adjusted somewhat after injury. DETAILS FOR THE FITNESS NERDS: *it is recommended to initially restrict high load OKC strengthening between 40-90 degrees of knee flexion and CKC between 0-80 degrees, which collectively can enable complete strengthening through the arc of motion, at reduced PFJ stress.*