



Return to Sport after Knee Injury / Surgery Guidelines

The intent of these guidelines is to provide the athlete with a framework for return to sports activity following injury. These guidelines should not take the place of medical advice if attempting to return to sports following an injury. If an athlete requires assistance in the progression of a return to sport program they should consult with their primary care physician, surgeon, or physical therapist.

Phase 1: Functional Balance and Core Strengthening

Goals:

- Enhance single leg weight bearing strength at varying angles of knee flexion.
- Improve side to side symmetry in lower extremity running mechanics.
- Improve single leg balance.
- Improve core stability and coordination.

Exercises:

- Lunges
- Single leg squatting exercises
- Treadmill training with a mirror to enhance symmetry in running mechanics.
- Balance activities (level surface, uneven surfaces, soft surfaces).

Criteria to progress to Phase II:

- Able to single leg squat to 60 degrees knee flexion and hold for at least 5 seconds.
- Symmetry in running mechanics on a treadmill (6-10 mph).
- Acceptable single leg balance performance involved extremity compared to uninvolved.

Phase II: Functional Strength

Goals:

- Improve lower extremity strength.
- Enhance force contribution symmetry during bilateral weight bearing activities.
- Enhance single leg landing force.

Exercises:

- High intensity balance training activities.
- Continue lower extremity weight bearing strengthening activities.
- Begin perturbation training.
- Single leg landing activities to improve dynamic muscular control.

Criteria to progress to Phase III:

- Side to side symmetry in peak torque knee flexion and extension.
- Plantar force total-loading symmetry measured during bipedal squat to 90 degrees knee flexion (less than 20% discrepancy between sides).
- Single-limb peak-landing-force symmetry on a 50 cm hop (less than 3 times body mass and within 10% in side-to-side measures).

Phase III: Power Phase

Goals:

- Improve single-limb power production.
- Improve lower extremity muscular endurance.
- Improve lower extremity biomechanics during plyometric activities.

Exercises:

- Mid-level intensity double-limb plyometric jumps.
- Low-level intensity single-limb repeated hops.
- Focus on proper technique during plyometric activities.

Criteria to progress to Phase IV:

- Single-leg hop for distance (within 15% on uninvolved side).
- Single-limb crossover triple hop for distance (within 15% on uninvolved side).
- Single-limb timed hop over 6 meters (within 15% on uninvolved side).
- Single-limb vertical power hop (within 15% on uninvolved side).
- Reassessment of tuck jump (either an 80-point score or 15% improvement)

Phase IV: Sport-Specific Symmetry

Goals:

- Equalizing ground reaction force attenuation strategies between limbs.
- Improving confidence and stability with high intensity change of direction activities.
- Improving and equalizing power endurance between limbs.
- Using safe biomechanics (increased knee flexion and decreased knee abduction angles) when performing high-intensity plyometric exercises.

Exercises:

- Power, cutting and change-of-direction tasks that are modified to the athlete's individual sport.

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- Provide verbal and visual feedback to assist the athlete develop safe biomechanics during plyometric moves.

Criteria for integration back to sports:

- Drop vertical jump landing force bilateral symmetry (within 15%).
- Modified agility T-Test (MAT) test time (within 10%).
- Single-limb average peak power test for 10 seconds (bilateral symmetry within 15%).
- Reassessment of tuck jump (either an 80-point score or 20% improvement).

References:

Myer GD, Paterno MV, Ford KR, Quatman CE, Hewett TE. Rehabilitation after anterior cruciate ligament reconstruction: Criteria-based progression through the return-to-sport phase. *Journal of Orthopedic Sports Physical Therapy*. 2006. 36; 385-399.

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9/07

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