

MOON ACL Rehabilitation Guidelines

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The guidelines have been developed to service the spectrum of ACL injured people (non-athlete ↔ elite athlete). For this reason, **example exercises** are provided instead of a highly structured rehabilitation program. **Attending rehabilitation specialists should tailor the program to each patient’s specific needs.**

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Progression from one phase to the next is based on the patient demonstrating readiness by achieving **functional criteria rather than the time elapsed since surgery**. The timeframes identified in parentheses after each Phase are *approximate* times for the average patient, **NOT** guidelines for progression. Some patients will be ready to progress sooner than the timeframe identified, whereas others will take longer.

The *recommended* number of visits to the rehabilitation specialist (including visits merely for evaluation / exercise progression) is **16 to 24 visits** with the majority of the visits occurring early (**BIW x 6 weeks**). However, it is recognized that some patient’s health plans are severely restrictive. For this reason, the *minimum* number of post-ACL reconstruction visits to a rehabilitation specialist has been set at **6 visits** for the MOON group patients.

If there are any questions regarding the MOON ACL Rehabilitation Guidelines, then please contact Dr. _____ or the Sports Medicine Center’s Rehabilitation Liaison: _____.

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Phase 0: Pre-operative Recommendations

- Normal gait
- AROM 0 to 120 degrees of flexion
- Strength: 20 SLR with no lag
- Minimal effusion
- Patient education on post-operative exercises and need for compliance
- Educated in ambulation with crutches
- Wound care instructions
- Educated in MOON follow-up expectations

PHASE 1: Immediate Post-operative Phase (Approximate timeframe: Surgery to 2 weeks)

GOALS

- Full knee extension ROM
- Good quadriceps control (≥ 20 no lag SLR)
- Minimize pain
- Minimize swelling
- Normal gait pattern

Crutch Use: WBAT with crutches (beginning the day of surgery)

Crutch D/C Criteria: Normal gait pattern

Ability to safely ascend/descend stairs without noteworthy pain or

Instability (reciprocal stair climbing)

Knee Immobilizer: None (Exception: First 24 hours after a femoral nerve block)

Cryotherapy: Cold with compression/elevation (e.g. Cryo-cuff, ice with compressive stocking)

- First 24 hours or until acute inflammation is controlled: every hour for 15 minutes
- After acute inflammation is controlled: 3 times a day for 15 minutes
- Crushed ice in the clinic (post-acute stage until D/C)

EXERCISE SUGGESTIONS

ROM

- *Extension:* Low load, long duration (~5 minutes) stretching (e.g., heel prop, prone hang minimizing co-contraction and nociceptor response)

- *Flexion:* Wall slides, heel slides, seated assisted knee flexion, bike: rocking-for-range
- Patellar mobilization (medial/lateral mobilization initially followed by superior/inferior direction while monitoring reaction to effusion and ROM)

Muscle Activation/Strength

- Quadriceps sets emphasizing vastus lateralis and vastus medialis activation
- SLR emphasizing no lag
- **Electric Stimulation:** *Optional* if unable to perform no lag SLR

Discontinue use when able to perform
20 no lag SLR

- Double-leg quarter squats
- Standing theraband resisted terminal knee extension (TKE)
- Hamstring sets
- Hamstring curls
- Side-lying hip adduction/abduction (Avoid adduction moment in this phase with concomitant grade II – III MCL injury)
- Quad/ham co-contraction supine
- Prone Hip Extension
- Ankle pumps with theraband
- Heel raises (calf press)

Cardiopulmonary

- UBE or similar exercise is recommended

Scar Massage (when incision is fully healed)

CRITERIA FOR PROGRESSION TO PHASE 2

- 20 no lag SLR
- Normal gait
- Crutch/Immobilizer D/C
- ROM: no greater than 5° active extension lag, 110° active flexion

PHASE 2: Early Rehabilitation Phase (Approximate timeframe: weeks 2 to 6)

GOALS

- Full ROM
- Improve muscle strength
- Progress neuromuscular retraining

EXERCISE SUGGESTIONS

ROM

- Low load, long duration (assisted prn)
- Heel slides/wall slides
- Heel prop/prone hang (minimize co-contraction / nociceptor response)
- Bike (rocking-for-range → riding with low seat height)
- Flexibility stretching all major groups

Strengthening

Quadriceps:

- Quad sets
- Mini-squats/wall-squats
- Steps-ups
- Knee extension from 90° to 40°
- Leg press
- Shuttle **Press without jumping action**

Hamstrings:

- Hamstring curls
- Resistive SLR with sports cord

Other Musculature:

- Hip adduction/abduction: SLR or with equipment
- Standing heel raises: progress from double to single leg support
- Seated calf press against resistance
- **Multi-hip machine in all directions with proximal pad placement**

Neuromuscular training

- Wobble board
- Rocker board
- Single-leg stance with or without equipment (e.g. instrumented balance system)
- Slide board
- Fitter

Cardiopulmonary

- Bike
- Elliptical trainer
- Stairmaster

CRITERIA FOR PROGRESSION TO PHASE 3

- Full ROM
- Minimal effusion/pain
- Functional strength and control in daily activities
- IKDC Question # 10 (Global Rating of Function) score of ≥ 7
(See page 9)

PHASE 3: Strengthening & Control Phase (Approximate timeframe: weeks 7 through 12)

GOALS

- Maintain full ROM
- Running without pain or swelling
- Hopping without pain, swelling or giving-way

EXERCISE SUGGESTIONS

Strengthening

- Squats
- Leg press
- Hamstring curl
- Knee extension 90° to 0°
- Step-ups/down
- Lunges
- Shuttle
- Sports cord
- Wall squats

Neuromuscular Training

- Wobble board / rocker board / roller board
- Perturbation training
- Instrumented testing systems
- Varied surfaces

Cardiopulmonary

- Straight line running on treadmill or in a protected environment
(NO cutting or pivoting)
- All other cardiopulmonary equipment

CRITERIA FOR PROGRESSION TO PHASE 4

- Running without pain or swelling
- Hopping without pain or swelling (Bilateral and Unilateral)
- Neuromuscular and strength training exercises without difficulty

PHASE 4: Advanced Training Phase (Approximate timeframe: weeks 13 to 16)

GOALS

- Running patterns (Figure-8, pivot drills, etc.) at 75% speed without difficulty
- Jumping without difficulty
- Hop tests at 75% contralateral values (Cincinnati hop tests: single-leg hop for distance, triple-hop for distance, crossover hop for distance, 6-meter timed hop)

EXERCISE SUGGESTIONS

Aggressive Strengthening

- Squats
- Lunges
- Plyometrics

Agility Drills

- Shuffling
- Hopping
- Carioca
- Vertical jumps
- Running patterns at 50 to 75% speed (e.g. Figure-8)
- Initial sports specific drill patterns at 50 – 75% effort

Neuromuscular Training

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- Varied surfaces

Cardiopulmonary

- Running
- Other cardiopulmonary exercises

CRITERIA FOR PROGRESSION TO PHASE 5

- Maximum vertical jump without pain or instability
- 75% of contralateral on hop tests
- Figure-8 run at 75% speed without difficulty
- IKDC Question # 10 (Global Rating of Knee Function) score of ≥ 8 (*See page 9*)

PHASE 5: Return-to-Sport Phase (Approximate timeframe: weeks 17 to 20)

GOALS

- 85% contralateral strength
- 85% contralateral on hop tests
- Sport specific training without pain, swelling or difficulty

EXERCISE SUGGESTIONS

Aggressive Strengthening

- Squats
- Lunges
- Plyometrics

Sport Specific Activities

- Interval training programs
- Running patterns in football
- Sprinting
- Change of direction
- Pivot and drive in basketball
- Kicking in soccer
- Spiking in volleyball
- Skill / biomechanical analysis with coaches and sports medicine team

RETURN-TO-SPORT EVALUATION RECOMMENDATIONS:

- Hop tests (single-leg hop, triple hop, cross-over hop, 6 meter timed-hop)
- Isokinetic strength test (60°/second)
- Vertical jump
- Deceleration shuttle test
- MOON outcomes measure packet (mandatory; should be completed post-testing)

RETURN-TO-SPORT CRITERIA:

- No functional complaints
- Confidence when running, cutting, jumping at full speed
- 85% contralateral values on hop tests
- IKDC Question # 10 (Global Rating of Knee Function) of ≥ 9
(See page 9)

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IKDC Question #10

How would you rate the function of your knee on a scale of 0 to 10 with 10 being normal, excellent function and 0 being the inability to perform any of your usual daily activities which may include sports?

CURRENT FUNCTION OF YOUR KNEE:

Cannot perform
Daily activities

No Limitation

0	1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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