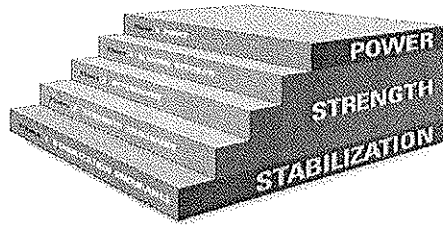


ACL Reconstruction



Components of an Integrated Rehabilitation Program

- | | |
|---|--|
| <ul style="list-style-type: none"> • Flexibility Training • Cardiorespiratory Training • Core Training • Balance Training | <ul style="list-style-type: none"> • Plyometrics Training • Speed, Agility, and Quickness Training • Integrated, Multi-planar Resistance Training • Sports-Specific Training |
|---|--|

Phase I: Protection, Mobility, and Activation (Weeks 0-4)

Goals

1. Protect tissues
2. Decrease pain and inflammation
3. Increase ROM within restrictions per surgeon
4. Prevent muscular inhibition
5. Promote correct muscle firing patterns with emphasis on core activation

Specific Exercises

- POD #1
 - Gait and transfer training
 - Patellar and Tendon mobilization
 - Ankle pumps
 - Wall slides or Seated PROM
 - Isometrics
 - TA
 - Quads
 - SLR (flexion, abduction and extension) (no quad lag)
 - Calf stretch
 - Ice/compression
- POD #2
 - POD #1 exercises
 - Bridging
 - Front and side planks
 - Bike (if PROM greater than 110 degrees)
- POW #1-3
 - POD #1 & #2 exercises
 - Tissue Extensibility
 - Quadriceps stretch
 - AROM
 - Flexionator (if present)
 - Extensionator (if present)
 - Neuromuscular control

- Weight shifting
- POW #4
 - Continue with tissue extensibility and ROM exercises
 - Neuromuscular control
 - Single limb bridging
 - Hip extension over edge of bed
 - Perturbation training (high kneeling, half kneeling, UE movement)
 - Balance/Proprioception
 - Weight shifting (Anterior-Posterior and Medial-Lateral)

Criteria for Progression

1. Minimal palpable swelling
2. Full weight bearing
3. Range of motion \geq 75% of uninvolved side
4. Minimal pain with ADLs and phase I exercises
5. Good patellar mobility

Muscle activation and firing patterns normal and without compensation with all phase I exercises

Phase II: Stability and Neuromuscular Control (Week 4-8)

Goals

1. Normalize gait pattern
2. Restore full ROM
3. Improve neuromuscular control, balance, and proprioception
4. Initiate functional exercise to improve movement patterns with emphasis on maintaining lumbopelvic and hip stability
5. Utilize SFMA

Stabilization Endurance

Principles

	<u>Reps</u>	<u>Sets</u>	<u>Tempo</u>	<u>% intensity</u>	<u>Rest Interval</u>	<u>Frequency</u>	<u>Duration</u>
Flexibility	1-3	1-3	30-60 sec hold	Mild to moderate stretch	N/A	5-7x/week	4-6 weeks
Core	12-20	1-3	Controlled	Mild	30-60 sec	5-7x/week	4-6 weeks
Balance	1-3	1-3	20-60 sec hold	Mild	30-60 sec	5-7x/week	4-6 weeks
Neuromuscular Reeducation	12-20	1-3	Controlled	Mild	30-60 sec	5-7x/week	4-6 weeks

Specific Exercises

- Tissue Extensibility
 - Soft tissue mobilization
 - TFL/ITB
 - Quadricep
 - Hip flexors
 - Piriformis
 - Calf
 - Stretching
 - Calf
 - Quadriceps (prone)
- PROM

- Wall slides or prone quad stretch
- Upright bike
- PROM

Neuromuscular Control and Core

Neuromuscular Control and Core Training Variables			
Planes of Motion	Range of motion	Type of resistance	Body position
Sagittal Frontal Transverse	Full Partial End-range	Cable Tubing Medicine ball Power ball Dumbbells Kettlebells	Supine Prone Sidelying Kneeling Half kneeling Standing Single leg Staggered-stance Standing progression on unstable surface
Neuromuscular Control and Core Training Exercise Selection			
Progression	Systematic	Proprioceptively Challenging	
Easy → Hard Simple → Complex Known → Unknown Stable → Unstable	Stabilization Strength Power	Stability ball BOSU Reebok Core Board Half foam roll Airex pad Bodyblade	

- Perturbation training (rhythmic stabilization in tall and ½ kneeling)
- Single limb dead lift (i.e. RDL's)
- Double limb rotations → single leg rotations
- Chops/lifts (tall kneeling, ½ kneeling)
- Prone hip extension off edge of bed
- Planks
- Bridging progression
- Quadruped UE/LE lifts
- Shuttle exercises/leg press (limited weight)

Balance

Stabilization Continuum	Lower Body	Upper Body
Floor ↓ Half foam roll ↓ Airex pad ↓ Wobble board ↓ Dyna disc/BOSU	Two leg – stable ↓ Staggered-stance stable ↓ Single-leg stable ↓ Two-leg unstable ↓ Staggered-stance unstable ↓ Single-leg unstable	Two-arm ↓ Alternating arms ↓ Single-arm ↓ Single-arm with trunk rotation

- Aerobic Conditioning
 - Biking
 - Swimming
 - Elliptical

Criteria for Progression

1. Pain-free and symmetrical gait pattern
2. Full ROM
3. No joint inflammation, muscle irritation, or pain
4. Normal muscle activation patterns and symmetry with multi-plane and multi-segmental movements
5. Single limb balance with good neuromuscular control for 1 minute
6. Hip strength: hip flexion >60% of uninvolved side; remaining planes >70% of uninvolved side
7. Quad strength: >70% of uninvolved side
8. LE Y-balance equal bilaterally
9. FMS \geq 14

Phase III: Strengthening (Week 8-12)

Goals

1. Restore muscular strength and endurance
2. Optimize neuromuscular control, balance, and proprioception
3. Restore cardiovascular endurance

Specific Exercises

- Tissue Extensibility
 - Movement Prep/Dynamic warm-up (see movement prep/dynamic warm-up sheet)
 - Soft tissue and stretching as necessary
- Joint Mobility
 - Joint mobs (if needed)
- Neuromuscular Control
 - Chops/lifts (squat, split squat, single limb stances)
 - Bridging progression
 - Pilates exercises
 - Squats with resistance
 - Lunges with resistance
- Strengthening
 - Double knee bends with sport cord
 - Resisted squats
 - Leg press
 - Lunges (3 way)
 - Balance squats
 - Single leg squats (without resistance → with sport cord)
- Aerobic Conditioning
 - Running
 - Biking
 - Swimming
- Sports-Specific Training
 - Initial agility drills (lateral agility, diagonal agility)

Criteria Progression

1. Hip strength: hip flexion >70% of uninvolved side; remaining planes >80% of uninvolved side
2. Pass sport cord test

3. Demonstration of initial agility drills with proper body mechanics

Phase IV: Return to Sport (Week 12-16)

Goals

1. Restore power, speed, and agility
2. Return to play
3. Independent maintenance program

Specific Exercises

- Sports-specific training
 - Advanced agility
 - Plyometrics
 - Speed
 - Power

Criteria for Progression

1. Cleared by physician
2. Ability to perform sports-specific drills at full speed without pain
3. Completed sport training and conditioning without pain or compensation