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Rehabilitation Protocol: ACL/PCL/MCL Reconstructions

Name: _____

Date: _____

Diagnosis: _____

Date of Surgery: _____

___ ACL Recon w/Hamstring Autograft

___ ACL Recon w/ Hamstring Allograft

___ ACL Recon w/Patellar Tendon Autograft

___ ACL Recon w/Patellar Tendon Allograft

___ MCL repair

___ MCL reconstruction with allograft

___ MCL reconstruction with autograft

___ PCL reconstruction with autograft

___ PCL reconstruction with allograft

Early range of motion permitted in range from 0 to _____

Treatment Frequency: __3__ times per week

Duration of Therapy Prescription: __8__ weeks

General Information:

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.

Modifications to ACL rehabilitation protocol for MCL repair/reconstruction:

- Non-weight bearing for 6 weeks
- Start quad sets and patella mobilization immediately post op
- After weight-bearing begins, limit leg press to 70 degrees knee flexion until 3 months
- Begin strength and proprioceptive training at 16-20 weeks

Modifications to ACL rehabilitation protocol for PCL repair/reconstruction:

- No ROM first week
- Avoid active hamstring exercises
- Crutches used for 6-8 weeks
- Brace used for 8 weeks
- Range of Motion – Weeks 0-1: None, Weeks 1-2: PROM 0-30°, Weeks 2-4: PROM 0-90° (MAINTAIN PRONE POSITIONING OR ANTERIOR-DIRECTED PRESSURE ON PROXIMAL TIBIA AS KNEE IS FLEXED FROM WEEK 1-4—NEED TO PREVENT POSTERIOR SAGGING AT ALL TIMES)
- AVOID ACTIVE HAMSTRING ACTIVITY AND ACTIVE KNEE EXTENSION FROM 90-70° UNTIL POST-OP WEEK 4

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

GOALS

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

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

Crutch D/C Criteria: 6 weeks NWB.

Normal gait pattern

Ability to safely ascend/descend stairs without noteworthy pain or instability (reciprocal stair climbing)

Knee brace: First week: locked in extension at all times including sleeping

Second week: locked in extension for ambulation and removed for therapy sessions

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

EXERCISE SUGGESTIONS:

ROM

- *Extension:* Low load, long duration (~5 minutes) stretching (e.g., heel prop, prone hang minimizing co-contraction and nociceptor response)
- *Flexion:* **Weeks 0-1:** None, **Weeks 1-2:** PROM 0-30° (MAINTAIN PRONE POSITIONING OR ANTERIOR-DIRECTED PRESSURE ON PROXIMAL TIBIA AS KNEE IS FLEXED FROM WEEK 1-4—NEED TO PREVENT POSTERIOR SAGGING AT ALL TIMES)
- 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 (SLR in brace for first 4 weeks)
- **Electric Stimulation:** *Optional* if unable to perform no lag SLR
Discontinue use when able to perform 20 no lag SLR
- Standing theraband resisted terminal knee extension (TKE)
- Hip adduction/abduction (resistance must be proximal to knee)
- 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 reps no lag SLR
- Normal gait
- ROM: no greater than 5° active extension lag

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

*****ACL/PCL/MCL: no weight bearing exercises first 6 weeks*****

GOALS

- 90 to 110° knee flexion
- Improve muscle strength
- Progress neuromuscular retraining

EXERCISE SUGGESTIONS

ROM

- **Weeks 2-4:** PROM 0-90°
- MAINTAIN PRONE POSITIONING OR ANTERIOR-DIRECTED PRESSURE ON PROXIMAL TIBIA AS KNEE IS FLEXED FROM WEEK 1-4—NEED TO PREVENT POSTERIOR SAGGING AT ALL TIMES
- Low load, long duration (assisted prn)
- Heel prop/prone hang (minimize co-contraction / nociceptor response)
- Flexibility stretching all major groups

Strengthening

Quadriceps:

- Quad sets
- Knee extension from 30° to 0°

Hamstrings:

- No active hamstring exercises

Other Musculature:

- Hip adduction/abduction: resistance proximal to knee
- Seated calf press against resistance
- **Multi-hip machine in all directions with proximal pad placement**

Cardiopulmonary

- Upper body (hand bike)

CRITERIA FOR PROGRESSION TO PHASE 3

- 90 degrees ROM
- Minimal effusion/pain
- Functional strength and control in daily activities

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

GOALS

- Full ROM
- Normal gait
- Stationary bike without pain or swelling
- Regain balance and proprioception

EXERCISE SUGGESTIONS

Strengthening

- Mini-squats (0-30)
- Leg press (0-90)
- Hamstring curl
- Knee extension 90° to 0°
- Step-ups/down
- Wall squats (0-30)

Neuromuscular Training

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

Cardiopulmonary

- Stationary bike (**seat higher than usual**)
- Stairmaster

CRITERIA FOR PROGRESSION TO PHASE 4

- Full ROM
- Normal gait
- Stationary bike without pain or swelling
- Neuromuscular and strength training exercises without difficulty

PHASE 4: Intermediate Training Phase (Approximate timeframe: 3 months to 6 months)

GOALS

- Normalize strength, endurance and daily function
- Maintain flexibility
- Jogging pain free with normal gait

EXERCISE SUGGESTIONS

Strengthening

- Advance closed chain strengthening exercises, progress with proprioception/balance activities
- Squats
- Leg press
- Hamstring curl
- Knee extension
- Step-ups/down
- Wall squats

Neuromuscular Training

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

Cardiopulmonary

- Begin treadmill walking, progress to jogging
- Continue Stationary bike (**seat higher than usual**)
- Continue Stairmaster

CRITERIA FOR PROGRESSION TO PHASE 5

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

PHASE 5: Advanced Training Phase (Approximate timeframe: 6 months to 9 months)

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

- 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 6

- Maximum vertical jump without pain or instability
- 75% of contralateral on hop tests
- Figure-8 run at 75% speed without difficulty

PHASE 6: Return-to-Sport Phase (Approximate timeframe: 9 months to 12 months)

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

RETURN-TO-SPORT CRITERIA:

- No functional complaints
- Confidence when running, cutting, jumping at full speed
- 85% contralateral values on hop tests

Please send progress notes.

Physician's Signature: _____

(I have medically prescribed the above treatments)

Michael S. Day, MD