Rehabilitation Guidelines for Bone-Tendon-Bone Autograft ACL Reconstruction

The intent of this protocol is to provide the clinician with a guideline to establish and progress a patient through post operative rehabilitation. It is not intended to be a substitute for one’s clinical decision making. The plan of care should be based upon the patient’s clinical exam and individual goals.

*Prior to initiation of interventions check with surgeon/operative report regarding progression. Need to take into consideration multiple variables including:
1) Graft used (patellar bone-tendon-bone, hamstring, Achilles)
2) Concomitant procedures (chondral picking, meniscus repair)
3) Concomitant injuries (MCL sprain, bone contusion)
4) Patient characteristics
5) Surgeon specific philosophy/preferences.

Based upon these variables, variations of progressions and patient outcomes may exist - however the following is a basic guideline that can be used for reference.

**Notify the surgeon immediately** of any concerns for DVT, infection, edema, loss of motion, or quadriceps inhibition.

**In order to progress across the phases of rehabilitation, the patient must meet BOTH the time requirement and the criterion requirement.**

**Pre-Op:**
- Evaluation of baseline measurements (ROM, Strength, girth)
- Measure for and fit for surgical brace (functional brace measurements if needed)
- Dispense Iceman with proper instruction (if indicated)
- Perform crutch training and issue crutches
- Evaluation should be scheduled for 2- 3 days after surgery.
- Post-op instructions and education from surgery date to hospital discharge
- Weight bearing: WBAT with crutches and brace locked in full extension
- Ice for swelling/ effusion while leg is elevated 20 minutes per hour

**Phase I: 0-6 weeks:**
- Goals:
  - Maintain integrity of repair
  - Decrease pain and edema
  - Promote tissue healing
  - Progressively increase passive range of motion in a staged pattern
  - Prevent muscle inhibition of the quadriceps
  - Patient education of precautions and progressions
- Precautions:
• Monitor edema – edema results in pain, loss of motion, and quadriceps inhibition.
• Monitor for DVT and infection
• Avoid open chain knee extension

➢ 0-2 weeks
  • PROM 0°-100°
    o Must achieve 0° extension
  • Re-Ed to quadriceps to prevent inhibition
  • Brace locked at 0° and WBAT
    o Beginning with week 2, patient may ambulate with a functional gait pattern without the brace while in the clinic.

➢ 2-4 weeks
  • PROM 0°-120° with staged ROM achieving 120° by the end of week 4
  • Brace locked at 0° and WBAT

➢ 4-6 weeks
  • Continue with strength, ROM, and endurance
  • Progress PROM to equal of unaffected side
  • Unlock brace when quadriceps strength permits

❖ Phase II: 6-14 weeks:
➢ Criteria to progress to Phase II
  • Appropriate healing by adhering to precautions in phase I
  • ROM goals achieved
  • Strength of 4+/5 of the lower extremity excluding knee extension
  • Minimal pain and edema

➢ Goals for Phase II
  • Normalize AROM
  • Continue to increase strength and endurance
  • Enhance dynamic stability through neuromuscular control

➢ 6-12 weeks
  • Continue with strength and endurance
  • Initiate perturbation training on unstable surface progressing from air disc to BOSU with feet in neutral stance to offset stance bilaterally.

➢ 12-14 weeks
  • Initiate low intensity SportMetrics
    o Ankle Bounces
    o Fast Steps
  • Initiate functional activities
  • Continue to monitor for improper compensations
Phase III: 14-24 weeks:

Criteria to progress to Phase III
- Appropriate healing and strength by adhering to precautions in Phase II
- No pain with AROM and strengthening activities
- Full AROM
- 5/5 strength of the lower extremity excluding knee extension

Goals
- Enhance dynamic stability
- Gradual restoration of strength, power, and endurance
- Advance neuromuscular control
- Return to full ADLs/work

14-16 weeks
- If strength is 70% or greater and with PHYSICIANS’s OK
  - Start: forward and back running, standing bike, jump rope, leg extension isotonic with a block of last 30° of extension

16+ Weeks
- Multiplane activities and sport specific movements
  - Start: figure of 8, lateral shuffles, caiacas, sports drills, hops, jumps, cut/ pivots
  - Do above with brace (if has a brace), no sudden starts and stops until physician gives approval

Week 20
- HEP as above
- Run up stairs, walk down, advanced cutting drills, jog to run (50-75% sprint speed)

Phase IV: 24+ Weeks:

Discharge
- 80-90% strength
- No pain with ADL’s
- Able to perform without deficiencies

Return to competitive sport with doctors OK and the following:
- 85% strength quad isokinetically
- H/S/quad ratio 70- 80%
- Functional progression of the following:
  - Fast starts and stops
  - Run up and down stairs
  - Single leg hop
  - Successful sport specific drills
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- Discuss brace options with doctor
- Goal 32- 52 weeks 85% to 100% strength
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ACL Reconstruction With Meniscal Repair

- Autograft ACL reconstruction with **MENISCUS REPAIR** – avoid compression and shear – **must** communicate with the surgeon for specifics.

- Phase I: 0-6 weeks
  - Goals:
    - Maintain integrity of repair
    - Decrease pain and edema
    - Promote tissue healing
    - Prevent muscle inhibition of the quadriceps
    - Patient education of precautions
  - Precautions:
    - Monitor edema – edema results in pain, loss of motion, and quadriceps inhibition.
    - Monitor for DVT and infection
  - 0-6 weeks
    - Protected weight bearing – must communicate with the physician to determine weight bearing status and location of the meniscus repair.
    - AROM/PROM 0°- 90° to protect meniscus repair.
      - May progress to 120° at week 4 with physician approval.
    - Strength of the lower extremity: clam shells, prone hip flexion with knee flexion, side lying abduction, theraband hip abduction,
  - 6+ weeks
    - Resume protocol at Phase II as above allowing for a 4 week transition phase to full weight bearing and ROM.

References:


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