Salina Regional Orthopedic Clinic
Salina Regional Health Center

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ACL Reconstruction Quad Autograft Rehabilitation Protocol

INDICATED PROCEDURES

- ACL Reconstruction
- Inside-Out Meniscus repair (medial/lateral)
- Partial meniscectomy (medial/lateral)
- Microfracture/OAT's procedure/juvenile cartilage transplantation medial/lateral compartment

GENERAL GUIDELINES

- Isolated ACL reconstruction utilizes knee immobilizer during the day for WBAT ambulation for 4-5 weeks and at night following surgery. Crutches are utilized for WBAT ambulation for 4 weeks following surgery until gait normalizes. If gait pattern remains abnormal at 4 weeks post-op they may wean to one crutch and continue until gait training becomes normal.
- ACL reconstruction with inside-out meniscus repair and/or microfracture/juvenile cartilage transplantation/OAT's utilizes a hinged knee brace for 4 weeks following surgery with TTWB. The hinged-brace remains locked at night for 4 weeks following surgery. While awake during the day and seated the hinged knee brace can be removed with the knee maintained in full extension. The brace is discontinued (both during the day and at night) at 6 weeks after surgery. The patient can be weaned from the crutches by week 4 when the gait pattern is normalized.
- Focus on regaining full extension immediately following surgery, with full extension achieved no later than 2 weeks following surgery. Elevate the foot with pillows during the day and at night to achieve this. In physical therapy utilize quad sets and prone heel hangs to achieve full extension. If unable to achieve full extension by 2 weeks post-op may use 5-10 lbs. with prone heel hangs to gain full extension.
- ACL reconstructions performed with inside-out meniscal repair or transplant follow the ACL protocol with avoidance of open kinetic chain hamstring work for 4 weeks.
- If microfracture/juvenile cartilage transplantation/OATs is performed the hinged-knee brace will be used for 6 weeks following surgery. The brace should be locked in full extension. Weight bearing is toe-touch only during the first 6 weeks post-op unless otherwise directed by the Orthopedic Surgeon.

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GENERAL PROGRESSION OF ACTIVITIES OF DAILY LIVING

- Patients may begin the following activities at the dates indicated (unless otherwise specified by the physician):
- Bathing/showering without brace after suture removal at 1 week post-op
- Sleep with knee immobilizer for 4-5 weeks for isolated ACL reconstruction and the knee immobilizer locked in extension for 4 weeks following ACL reconstruction with meniscus repair
- Driving: 1 week for automatic cars, left leg surgery (when no longer taking narcotic pain meds)
- 4 weeks for standard cars, right leg surgery (when no longer taking narcotic pain meds)
- Weight bearing as tolerated immediately post-op for isolated ACL reconstruction and 50% weight bearing for 4 weeks following surgery for ACL reconstruction with meniscus repair.

PHYSICAL THERAPY ATTENDANCE

The following is an approximate schedule for supervised physical therapy visits:

Phase I (0-6 weeks):	1-2 visit/week
Phase II (6-8 weeks):	2-3 visits/week
Phase III (2-months):	2 visits/week
Phase IV (6months+):	Discharge after completion of appropriate functional progression

REHABILITATION PROGRESSION

The following is a general guideline for progression of rehabilitation following ACL autograft reconstruction. Progression through each phase should take into account patient status (e.g. healing, function) and physician advisement. Please consult the physician if there is any uncertainty concerning advancement of a patient to the next phase of rehabilitation.

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PHASE I

- Begins immediately post-op through approximately 4 weeks. Below is outlined the protocol for isolated ACL reconstruction. See above for alteration to this protocol when inside-out meniscus repair is performed as well.

Goals:

- Protect graft fixation
- Minimize effects of immobilization
- Control inflammation
- Full extension range of motion
- Educate patient on rehabilitation progression

Brace:

- 0-4 weeks: Knee immobilizer in full extension for ambulation and sleeping. Patient can place a pillow under the leg/foot to bring the knee into full extension.

Weight-Bearing Status:

- Isolated ACL reconstruction: weight bearing to tolerance immediately
- ACL reconstruction with inside-out meniscus repair: toe-touch weight bearing with brace locked in extension for 4 weeks following surgery. Progress to weight bearing as tolerated beginning week 5.
- ACL reconstruction with cartilage restoration procedure (micro fracture, OAT's, juvenile cartilage transplantation): toe-touch weight bearing with brace locked in extension for 6 weeks following surgery. Progress to weight bearing as tolerated during week 7.

Therapeutic Exercises:

- Heel slides
- Calf pumps
- Quad sets, hamstring sets (consider NMES for poor quad set)
- Patellar mobilization
- Non-weight-bearing gastroc/soles, hamstring stretches
- SLR, all planes, with brace in full extension until quadriceps strength in sufficient to prevent extension lag
- Quadriceps isometrics at 60° and 90°. Avoid active terminal extension (30-0°) for the first 6 week**s post-operatively**

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PHASE II

- Begins approximately 4 weeks post-op and extends to approximately 8 weeks

Criteria for advancement to Phase II:

- Good quad set, SLR without extension lag
- Approximately 110°of flexion
- Full extension
- No signs of active inflammation

Goals:

- Initiate closed kinetic chain exercises
- Restore normal gait
- Protect graft fixation

Brace/Weight-Bearing Status:

- Patient must exhibit non-antalgic gait pattern. Consider using single crutch or cane until gait is normalized.

Therapeutic Exercises:

- Wall slides 0-45°, progressing to mini-squats
- 4-way hip
- Stationary bike (begin with high seat, low tension to promote ROM. Progress to single leg)
- Closed chain terminal extension with resistive tubing or weight machine
- Toe raises
- Balance exercises (e.g. single-leg balance, KAT)
- Hamstring curls
- Aquatic therapy with emphasis on normalization of gait
- Continue hamstring stretches. Progress to weight-bearing gastroc/soleus stretches

PHASE III

- Begins at approximately 8 weeks and extends through approximately 4 months

Goals:

- Full range of motion
- Improve strength, endurance and proprioception of the lower extremity to prepare for functional activities
- Avoid over-stressing the graft
- Protect the patellofemoral joint

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Therapeutic Exercises:

- May begin use of the elliptical trainer at 8 weeks post-op if minimal swelling at >110° flexion
- May begin jogging at 12 weeks post-op if normal range of motion and no/limited swelling
- If meniscus repair performed as well elliptical delayed until 3 months and jogging until 4 months
- Continue and progress previous flexibility and strengthening activities
- Knee extensions 90-45°and progress to eccentrics
- Advance closed kinetic chain activities (leg press, one-leg mini-squats 0-45°of flexion, step-ups beginning at 2" and progress to 8", etc.)
- Progress proprioception activities (slide board, use of ball, racquet with balance activities, etc.)
- Progress aquatic program to include pool running, swimming (no breaststroke)

PHASE IV

- Begins at approximately 4 months and extends through approximately 6-9 months

Criteria for advancement to Phase IV:

- Full, pain-free ROM
- No evidence of patellofemoral joint irritation
- Strength and proprioception approximately 70% of uninvolved
- Physician clearance to initiate advanced closed kinetic chain exercises and functional progression

Goal:

- Continue and progress previous flexibility and strengthening activities
- Functional progression including:
  - Walk/job progression
  - Forward/backward running at ½, ¾ and full speed

PHASE V

- Begins at approximately 6-9 months post-op

Criteria for advancement to Phase V:

- No patellofemoral or soft tissue complaint
- Necessary joint ROM, strength, endurance and proprioception to safely return to work or athletics
- Physician clearance to resume partial or full activity

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Goals:

- Initiate cutting and jumping activities
- Completion of appropriate functional progression
- Maintenance of strength, endurance and proprioception
- Patient education with regards to any possible limitations

Therapeutic Exercises:

- Functional progression, including but not limited to:
  - Walk/job progression
  - Forward/backward running at ½, ¾ and full speed
  - Cutting, cross-over carioca, etc.
  - Plyometric activities as appropriate to patient's goals
  - Sport-specific drills
  - Safe, gradual return to sports after successful completion of functional progression
  - Maintenance program for strength and endurance

Functional Knee Brace:

Some studies have shown a protective effect for functional knee bracing following ACL reconstruction while other studies have shown no benefit. A functional knee brace may be recommended by the Orthopedic Surgeon for athletic activity for 1-2 years following ACL reconstruction. Please discuss this further with the Orthopedic Surgeon if you are interested.