PHYSICAL THERAPY PRESCRIPTION AND PROTOCOL:
ACL Reconstruction +/- Meniscus Repair

While in the hospital:
Following your surgery, your leg will be placed in a post-operative brace while in the operating room. A Cryocuff or ice bags should be used to minimize swelling. The brace is to be worn full-time until your first post-operative visit, with the exception of performing your exercises.

You will start to rehabilitate your knee the day of surgery. You will be getting up and walking, wearing your brace and using both crutches. You will be able to put weight on your leg. You will be instructed in specific range of motion and strengthening exercises by a physical therapist either prior to or shortly after your surgery. You should wear the brace while sleeping, as well as during the day and while walking.

Before leaving the hospital, you should be comfortable walking independently with crutches. You should also be familiar with your home exercise program. You should have full knee extension and 90° of knee flexion by the time of your first post-operative visit with Dr. Battaglia.

Following hospital discharge:
Usually, discharge occurs on the same day as your surgery. You will need to set aside 3-4 times per day for your stretching and strengthening home exercise program. Icing should be done for at least 15-20 minutes at a time, after each exercise session and may be done up to once per hour.

You may loosen the brace straps or remove the brace when sitting, but always wear the brace with the straps tightened when walking. You should also continue to use both crutches. Use the elastic stocking or ace wrap on your leg until you no longer need the brace. Elevating your leg in bed by placing a pillow or rolled-up blanket between your mattress and box spring will assist in decreasing your leg swelling.

You will return to see Dr. Battaglia approximately 7-14 days following surgery to have sutures removed and progress assessed. At this time, you will begin formal physical therapy. Your therapist will instruct you on proper exercise progression based on individual assessment of swelling, range of motion, strength and leg control. Crutches can be discontinued after a proper assessment by your therapist or physician. At all times, maintenance of full knee extension is critical.
Phase I (Week 0-2): One visit per week, teach home program

Goals
- Control inflammation and pain
- CPM increase to 90° as tolerated
- Full active extension and 90° of flexion
- Active quadriceps control

Brace
- Locked in extension for ambulation for 2 weeks
- Sleep with brace locked in extension until first post-operative visit
- May remove brace for CPM and unlock brace for exercises (except straight leg raises)

Weight bearing status
- Weight bearing as tolerated with crutches

Therapeutic exercises
- Ice, compression garment and modalities to reduce pain and inflammation
- Straight leg raises in all planes (use brace locked in extension initially until quad strength is sufficient to prevent extensor lag)
- Heel slides, calf pumps, quadriceps sets
- Electrical stimulation as needed
- Wall slides to 45°
- Patellar mobilization
- Prone leg hangs
- Proprioception with active and passive joint positioning
- Balancing on stable platform with eyes open and closed

Phase II (Weeks 2-6): Two to three visits per week

Criteria
- Good quad activity and straight leg raises without extensor lag
- 90° of knee flexion
- Full extension

Goals
- Restore normal gait
- Restore full range of motion, unless also meniscal repair. (If meniscal repair, limit knee flexion to < 90° for 4 weeks)
- Protect graft fixation

Brace
- If no meniscus repair, may discontinue brace at once normal gait pattern and quad control is achieved
- If meniscus repair, brace will be worn for 4 weeks at 0-90°

Weight bearing status
- Continue with full weight bearing
- If no meniscus repair, crutches can be discontinued when good quadriceps control and normal gait is achieved (usually 2-3 weeks)
- If meniscus repair, discontinue crutches only after 4 weeks.

Therapeutic exercises
- Mini-squats (0-45°)
- Stationary bike with high seat and low resistance
- Prone leg hangs with ankle weights until full extension achieved
- Closed chain exercises (leg press limit to 0-45°)
- Pool walking / light jogging
- Stair climbing (up, down, forward, backward) and StairMaster
Toe raises, hamstring and gastroc / soleus stretches  
Proprioception: mini-trampoline standing, unstable platform with eyes open and closed, standing ball throwing and catching

**Phase III (Weeks 6-16): Two to three visits per week**

_Criteria_
- Normal gait
- Full range of motion (flexion and extension)
- Sufficient strength and proprioception to initiate functional activities

_Goals_
- Improve confidence in the knee
- Avoid overstressing the graft
- Protect patellofemoral joint
- Progress with strength and proprioception

_Therapeutic exercises_
- Continue with flexibility exercises
- Advance closed chain kinetic strengthening (one-leg squats, leg press 0-60°)
- StairMaster, elliptical trainer, cross-country ski machine
- Plyometrics: stair jogging, box jumps (6 to 12-inch height)
- Proprioception: Mini-tramp bouncing, lateral slide board, ball throwing and catching on unstable surface
- Functional training at 8-12 weeks: straight-ahead jogging, progress to running
- Functional training at 12 weeks: running, figure of eight patterns
- Agility at 12 weeks: shuttle runs, lateral slides, Carioca cross-overs, stair running, box jumps (1-2 foot heights)

**6 weeks post-op**
- Begin use of conventional weight lifting equipment (i.e. leg extension machines, Smith machines, squat racks etc), start with light weight and high reps and sets and progress towards shorter sets and reps and high weight; **if hamstring graft or allograft used, wait until 8 weeks post-op before using leg curl machines**

**8 weeks post-op**
- Continue as above
- Assessment of jogging on treadmill (Wait until 3 mths for this if hamstring or allograft used)
- Plyometrics (Wait until 3 mths for this if hamstring or allograft used)
- Low intensity vertical and lateral hopping to begin, use both feet, move to one foot ASAP
- Volume for plyometrics (not conditioning exercise but a strengthening one) for rehabilitation
  - 40-60 foot contacts/session for beginners
  - 60-80 foot contacts/session for intermediate
  - 80-100 + foot contacts/session for advanced
- If plyometric exercise intensity is high, volume must be decreased, give ample recovery time between sets
- Lateral movements – stepping, shuffling, hopping, carioca
- Isokinetic ex: 180, 150, 120, 90, 60°/sec 8-10 reps each up and down spectrum
- Eccentric quad exercises with manual resistance

**12 weeks post-op**
- Isokinetic test for strength – see attached protocol, use results to refine training approach if test not passed
- Continue with strength and power development
- Running and sport specific drills under ATC or PT supervision
Phase IV (Weeks 16+): One to two visits per week

Criteria
- Full, pain-free range of motion
- No patellofemoral irritation
- Sufficient strength and proprioception to progress functional activities

Goals
- Return to unrestricted activity by 6 months

Therapeutic exercises
- Progress with flexibility and strengthening program
- Continue running, advance speed
- Incorporate cutting drills into agility training
- Advance heights for plyometric conditioning
- Sports-specific drills (start at 25% speed and advance as tolerate)

Criteria for return to sports: Full painless range of motion, no effusion, quadriceps strength 85% of contralateral side, hamstring strength 100% of contralateral side, side-to-side difference <3mm translation

Frequency: 2-3x per week  Duration: 16-20 weeks

Special instructions: ________________________________________________________________

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