ACL Reconstruction Protocol (Allograft)

Week one	Week two
Initial Evaluation	**Evaluate**
➢ Range of motion ➢ Joint hemarthrosis ➢ Ability to contract quad/vmo ➢ Gait (generally WBAT in brace) ➢ Patella Mobility ➢ Inspect for infection/signs of DVT ➢ Assess RTW and sport expectations	➢ Range of Motion ➢ Joint Hemarthrosis ➢ Ability to contract quad/vmo ➢ Signs of infection or DVT ➢ Patella mobility
Patient Education	**Patient Education**
➢ Support Physician prescribed meds ➢ Ensure compliance w/ pre-op hep ➢ Reinforce use of brace and assistive device ➢ Restate surgical precautions (No open chain knee extension) ➢ Discuss frequency and duration of treatment (2-3x/wk is expected for the first 8 weeks, followed by intermittent appointments over another 6-8 weeks)	➢ Reassess crutch use; May use single crutch if appropriate ➢ Brace may be opened to 10 degrees less than the patients pain free ROM if good quad contraction ➢ Reinforce precautions
Therapeutic Exercise	**Therapeutic Exercise**
➢ Review and update pre-op hep (heel slides, ankle pumps, quad sets, towel stretch) ➢ May complete AROM and Isometrics within surgical precautions	➢ Initiate bicycle (do not force flexion) ➢ Should include early weight shifting and proprioception ➢ May complete AROM and Isometrics within surgical precautions
Manual Techniques	**Manual Techniques**
➢ Grade I and II patella mobilizations ➢ PROM as tolerated (focus on extension)	➢ Grade III-IV patella mobilization (if needed) ➢ Posterior capsule mobilization (if needed) ➢ Incision mobilization
Modalities	**Modalities**
➢ NMES / Interferential / biofeedback ➢ Ice	➢ Modalities may be used as needed
Aquatics	**Aquatics**
➢ Defer until appropriate wound healing or clearance from MD	➢ Gait: forwards/backwards walking, side stepping ➢ Shallow end: closed chain (supported squats, standing iliopsoas, quadriceps, hamstring, and gastrocnemius stretching, calf raises, terminal knee extension) and open chain (hamstring curls no resistance) ➢ Balance: Feet together, tandem, SLS ➢ Deep end: open chain (mini-bicycles, hip abduction, skiers with barbells), consider focus on duration versus repetitions
Goals	**Goals**
➢ Gain full knee extension ➢ Control pain ➢ Reduce joint hemarthrosis ➢ Restore voluntary quad contraction ➢ Independence with post-op precautions ➢ 0-80 degrees ROM	➢ Gain full knee extension ➢ Restore voluntary quad contraction ➢ Decrease Hemarthrosis ➢ Prevent excessive soft tissue scarring ➢ 0-100 degrees ROM

Week Three	Weeks Four to six
Evaluate	**Evaluate**
➢ Gait and brace needs ➢ Quad Contraction ➢ ROM ➢ Balance	➢ Patella position and related symptoms ➢ ROM ➢ Joint laxity ➢ Gait ➢ HEP compliance
Patient Education	**Patient Education**
➢ Wean from crutches	➢ D/C brace if good quad contraction
Therapeutic Exercise	**Therapeutic Exercise**
➢ Closed chain exercises for quad contraction and proprioception ➢ May initiate partial weight bearing press from 70-0 degrees ➢ Single leg stance ➢ Bilateral dynamic balance activity	➢ Bilateral dynamic balance activity ➢ Progress to full weight bearing isotonics 90-0 degrees at 4 weeks ➢ Initiate resistive hamstring curl ➢ Single leg dynamic balance activity on a stable surface at week 6 ➢ Single leg isotonic exercises at week 6
Manual Techniques	**Manual Techniques**
➢ Patella mobilizations as indicated ➢ PROM and posterior capsule stretch as indicated	➢ Patella mobilizations as indicated ➢ PROM and posterior capsule stretch as indicated
Modalities	**Modalities**
➢ Any as Indicated	➢ Any as Indicated
Aquatics	**Aquatics**
➢ Gait: forwards/backwards, side stepping, add fins for resistance ➢ Shallow end: closed chain; continue previous (add unsupported squats, static lunging in single plane, step ups) and open chain (knee flexion stretching with hydrocuff) ➢ Balance: SLS with perturbations (kick board, ball toss) ➢ Deep end: open chain (bicycles, hip abduction, skiers, knee to chest with barbells), add fins for resistance	➢ Gait: forwards/backwards, side stepping, add fins for resistance ➢ Shallow end: closed chain; continue previous (add diagonal or dynamic lunges, lateral step downs) and open chain (knee flexion stretching with hydrocuff for ROM) ➢ Balance: continue SLS activities ➢ Deep end: open chain (add running supine/prone/upright with barbells), add fins for resistance and closed chain (squats on barbells)
Goals	**Goals**
➢ Gait with single axillary crutch ➢ Continue to reduce any localized hemarthrosis ➢ Restore voluntary muscle control ➢ Single leg stance with eyes closed for at least 10 seconds ➢ 0-120 degrees ROM	➢ FWB without brace or assistive device if good quad control and physician in agreement ➢ No pain with ADL's ➢ Quad strength at least 4-/5 ➢ Normal ROM

Weeks six to twelve	Weeks twelve to discharge
Evaluate	**Evaluate**
➢ Patella mobility / crepitus ➢ Excessive joint laxity ➢ Balance / single leg stance ➢ HEP compliance ➢ Assess foot and ankle for biomechanical optimization	➢ Any excessive joint laxity ➢ Isokinetic Strength test and/or functional hop testing for comparison to be completed per physician preference at 16 weeks ➢ Address any deficits that may limit return to work or sport goals ➢ HEP compliance
Therapeutic Exercise	**Therapeutic Exercise**
➢ Progress to closed chain exercises on unstable surfaces at week 8 ➢ Progress Isotonic strength training to include movement in multiple planes at 8 weeks ➢ Progress balance activity to single leg dynamic activity and unstable surfaces at 10 weeks ➢ Cardiovascular training at 10 weeks (bike, swim and elliptical) ➢ May begin ACL group in CFA at 8 weeks (with physician approval)	➢ Sports specific exercises ➢ Encourage participation in the CFA ➢ Complete agility and running activity with good test results and physician approval at 16 weeks ➢ May begin bilateral low level plyometrics with good test results and physician approval at 16 weeks
Aquatics	**Aquatics**
➢ Continue with previous exercises for strength deficits or continued edema ➢ Initiate plyometrics ➢ Likely transition to land therapy at week 8	➢ Continue with previous exercises for strength deficits or continued edema
Goals	**Goals**
➢ 4+/5 strength with manual testing by week ten ➢ Good stability across tibiofemoral joint particularly with single leg balance and control of terminal knee extension ➢ May complete exercise independently with intermittent follow up appointments when above criteria is met (Typically 10 weeks)	➢ Strength of quadriceps and hamstrings no less than 85% per isokinetic test at 16 weeks ➢ Functional hop test for time and distance at 85% or greater at 16 weeks if applicable ➢ Discharge with full return to work or sport activity

Precautions and concomitant issues
The completion of ACL Reconstruction using an allograft eliminates the potential issues that occur with hamstring and patella tendon harvest sites. However, the progression of exercise will be slower as longer healing times will be needed. Gaining full knee extension early in the rehab process is crucial for return of volitional quadriceps contraction to avoid extensor mechanism dysfunction.
Menisectomy
➢ No modification required
Meniscal Repair
➢ No combined weight bearing and flexion, or flexion beyond 90 degrees for at least 4 weeks
Micro fracture
➢ NWB typically four weeks, and PWB for two weeks
MCL injury
➢ May need to use brace during exercise (Clarify with surgeon on a case by case basis) ➢ May want to consider completing exercises with slight tibial IR to decrease stress on MCL ➢ May limit motion to the sagittal plane for 4-6 weeks
PCL injury
➢ Follow PCL protocol as it will be a slower rehab than ACL
Chondromalacia
➢ Typically our physicians will give us insight into the location and severity of chondromalacia (grades I to IV) ➢ The location of chondromalacia often provides insight regarding faulty posture and biomechanics. ➢ Both location and severity should be considered when designing treatment programs
Chondroplasty
➢ No modification required ➢ Consider unloading brace for return to activity if limited by pain

References:

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- Villalta, E. M., Peiris, C. L. (2013). Early aquatic physical therapy improves function and does not increase risk of wound-related adverse events for adults after orthopedic surgery: a systematic review and meta-analysis. *Arch Phys Med Rehabil*, 94(1): 138–148.
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Updated 2009