

Phase I – Maximum Protection**Weeks 0 to 2:**

- Brace – locked in full extension during all ambulation and weight bearing as tolerated for 6 weeks
 - Can unlock brace to allow for 0-30 degrees for unloaded range of motion only.
- Use two crutches initially with gradual progression of weight bearing to full or WBAT
- Limit knee flexion to 0-30 degrees for 2 weeks.

Goals

- Reduce inflammation
- Normalize superior/inferior patella mobility with manual mobilizations
- Full extension
- Passive/active ROM with 30 degree flexion limit

Exercise progression

- Quadriceps setting, emphasize VMO, using NMES as needed
- Emphasize patellofemoral mobilizations
- Passive/active knee range of motion with 30 degree flexion limit
- Multi plane straight leg raising
- Open chain hip strengthening
- Gait training

Weeks 2 to 4:

- Brace- locked in full extension during all ambulation and WBAT
- Progress ROM as tolerated to 0-60 degrees

Goals

- Reduce inflammation
- Maintain 0 degrees of knee extension

Exercise progression

- Full knee extension/hyperextension
- 30 degrees of knee flexion, progressing 30 degrees of motion/week
 - Goal: 90 degrees at week 6
- Progress off of crutches

Weeks 4 to 6:

- Brace- unlock brace during ambulation and WBAT
- Progress ROM as tolerated to 0-90 degrees
- Initiate bike with light resistance
- Initiate loaded flexion 0-90 degrees

Goals

- Reduce inflammation and pain
- Maintain 0 degrees of knee extension

Exercise progression

- Quadriceps setting
- Straight leg raises
- Multi-plane open chain hip strengthening
- Bridge with knee extension (ball)
- Lower extremity stretching (hamstring, calf, ITB)
- Calf raises

Phase II – Progressive Stretching and Early Strengthening

Weeks 6 to 8:

- Discontinue Brace
- Progress to full ROM as tolerated

Goals

- Full knee extension/hyperextension
- Progress to full knee flexion ROM
- No swelling
- Normalize gait mechanics
- Normalize patellofemoral joint and scar mobility

Exercise progression

- Continue to emphasize patella mobility
- Begin unilateral closed kinetic chain program
- Multi-plane open and closed kinetic chain hip strengthening
- Step-up progression
- Stationary biking and treadmill/outdoor walking
- Deep water pool program when incisions healed. Focus on range of motion
- Proprioception drills

Phase III – Advanced Strengthening and Endurance Training

Weeks 8 to 10:

- Full ROM

Goals

- Reduce inflammation
- Full range of motion
- Normal gait

Exercise progression

- Begin closed chain squat progression (mini-squat, etc)
- Gym strengthening program
- Increase intensity of stationary bike program. May add elevation to treadmill walking and elliptical trainer
- Advance intensity of deep water pool program; focus on endurance training

Weeks 10 to 12:

Goals

- Full knee flexion and extension with terminal stretch
- Progressive strengthening
- Increase muscular endurance
- Pass preliminary functional test around 12 weeks

Exercise progression

- Squat progression: progress as tolerated with focus on swelling and pain
- Lunge progression (retro, walk, and split) as indicated
- Controlled movement series
- Focus on increased lower extremity flexibility
- Swimming freestyle
- Gym strengthening progression

Phase IV – Advance Strengthening and Running Progression

Weeks 12 to 14:

- Administer Preliminary functional test for physician to review
- Initiate straight line jogging at 12 weeks if proper biomechanics are demonstrated

Exercise progression

- Conservative gym program (avoid leg extension and lunge due to stress on patellofemoral joint)
- Outdoor biking-week 12

- Swimming freestyle-week 12
- Backward elevated treadmill walking-week 12 to 16
- Lateral lunge progression-week 16
- Shallow water pool running-week 16
- Basic ladder series-4+ months
- Basic plyometric box progression

Weeks 14 to 20:

- Advance training in preparation for functional testing
- Progress plyometric training from double leg to single leg activities

Criteria to progress to Phase V

- Pass Return to Sport test at >90% (involved vs. uninvolved limb)
 - See testing protocol—perform at 16 weeks

Phase V- Return to Sport

Weeks 20 to 24:

- Return to Sport and Functional Drills Phase
- Follow-up examination with the physician
- Sports test for return to competition at 6 months

Exercise progression

- Advance ladder, hurdle and plyometrics
- Sport specific field/court drills
- Non-contact drills

Criteria to be released for return to sport

- Follow-up examination with the physician
- Pass return to sport functional test at >90 % (involved vs. uninvolved limb)
- Display symmetry and confidence in high-speed cutting, multi-plane plyometric drills, sprinting and decelerating

Revised ***