

**TOTAL KNEE ARTHROPLASTY (ACTIVE)
REHABILITATION PROTOCOL**
Chase D. Smith, MD

I. Immediate Postoperative Phase (Day 1 to 10)

- Goals:**
- 1) Active quadriceps muscle contraction
 - 2) Safe (isometric control), independent ambulation
 - 3) Passive knee extension to 0 degrees
 - 4) Knee flexion to 90 degrees or greater
 - 5) Control of swelling, inflammation, bleeding

Day 1 to 2

Weight Bearing - Walker/two crutches WBAT

ROM – 0-70°

Cryotherapy - Commercial unit used continuously or ice 20 min of each hour

Exercises:

- * Ankle Pumps with leg elevation
- * Passive knee extension exercise
- * Electrical stimulation to quads
- * Straight leg raises (SLR)
- * Quad sets
- * Knee extension exercise 90-30 degrees
- * Hamstring stretches (gentle)

Day 4 to 10

Weight Bearing - As tolerated

ROM – 0-90°

Exercises:

- * Ankle pumps with leg elevation
- * Passive knee extension stretch – emphasis on full knee extension
- * Active assistive ROM knee flexion
- * Quad Sets
- * Straight leg raises
- * Hip abduction/adduction
- * Knee extension exercise 90-0 degrees
- * Continue use of cryotherapy

Gait Training - Continue safe ambulation. Instruct in transfers

II. Motion Phase (Week 2-6)

- Goals:**
- 1) Improve range of motion
 - 2) Enhance muscular strength/endurance
 - 3) Dynamic joint stability
 - 4) Diminish swelling/inflammation
 - 5) Establish return to functional activities
 - 6) Improve general health

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Criteria to enter Phase II

- 1) Leg control, able to perform SLR
- 2) Active ROM 0-90 degrees
- 3) Minimal pain/swelling
- 4) Independent ambulation/transfers

Week 2-4

Weight Bearing - WBAT with assisted device

ROM - Week 2: 100-105°

Week 3: 110-115°

Week 4: 125°+

Exercises:

- * Quad Sets
- * Knee extension exercise 90-0 degrees
- * Terminal knee extension 45-0 degrees
- * Straight leg raises (flexion/extension)
- * Hip abduction/adduction
- * Hamstring curls
- * 1/4 Squats
- * Stretching
 - Hamstrings, Gastrocnemius, Soleus, Quads
- * Bicycle ROM Stimulus
- * Initiate pool program
- * Continue passive knee extension stretch
- * Continue use of cryotherapy
- * Discontinue use of TEDS hose at 2-3 weeks (physician's approval)
- * Begin front lunge & lateral step-up week 3
- * Begin machine program (gentle) week 4
 - Leg press
 - Hip abduction/adduction

III. Intermediate Phase (Week 5-12)

- Goals:**
- 1) Enhancement of strength/endurance
 - 2) Eccentric/concentric control of the limb
 - 3) Cardiovascular fitness
 - 4) Functional activity performance

Criteria to enter Phase III

- 1) Range of motion 0-115 degrees
- 2) Voluntary quadriceps muscle control
- 3) Independent ambulation
- 4) Minimal pain/inflammation

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Week 5-10

Exercises:

- * Continue all exercises listed in Phase II
- * Initiate progressive walking program
- * Initiate endurance pool program
- * Continue closed kinetic chain & machine exercises
- * Progress to entire lower extremity strengthening
- * Return to functional activities
- * Emphasize eccentric/concentric knee control

IV. Advanced Activity Phase (Week 10-26)

- Goals:** 1) Allow selected patients to return to advanced level of function (recreational sports)
2) Maintain/improve strength and endurance of lower extremity
3) Return to normal life style

Criteria to enter Phase IV

- 1) Full non-painful ROM 0-120/125 degrees
- 2) Strength of 4+/5 or 85% of contralateral limb
- 3) Minimal to no pain and swelling
- 4) Satisfactory clinical examination

Exercises:

- * Continue maintenance program
- * Quad Sets
- * Straight Leg Raises (flexion/extension)
- * Hip abduction/adduction
- * 1/2 squats
- * Lateral step ups
- * Knee extension exercise 90-0 degrees
- * Machine weights as tolerated
- * Bicycle for ROM stimulus and endurance
- * Stretching
 - Knee extension to 0 degrees
 - Knee flexion to 105 degrees
- * Initiate gradual golf, tennis, swimming, bicycle, walking program