

## Total Knee Arthroplasty Procedure Rehab Protocol

Patient is highly encouraged to attend prehab 1-2 weeks prior to their surgery.

PREHAB: Education on adaptive equipment/assistive device, Mobility, Home Environment, HEP, Caregiver Assist, don/doff T.E.D. stockings/TUG/LEFS

### Phase 1 – Acute (POD 0-1, Hospital Discharge x1 Days)

#### Goals for Phase 1

- ROM 0-90
- Safe Care transfer
- Stair negotiation
- Household distance ambulation

#### Precautions

- No twisting/pivoting upon leg

#### PT Goals – POD 1

- Bed Mobility:
  - Perform bed mobility modified independently per home set up (bed, recliner chair, etc.)
- Transfers:
  - Perform transfers modified independently from all surfaces.
  - Complete car transfer training
- Ambulation:
  - Ambulate 150 feet modified independently to demonstrate household distances
- Stairs:
  - Perform stair mobility modified independent or with supervision depending on home situation
- Independent with HEP of phase 1

#### OT Goals – POD 1

- Shower/Bathing:
  - If patient has tub/shower, complete transfer at modified independent to home plan (transfer bench or stepping into tub).
- Dressing:
  - Don lower body street clothing including pants, standard socks, shoes at modified independent or independent. Use AD ONLY if needed, promote as close to baseline function as possible.
  - Doff/Don of TEDs and Tetragrips at modified independent or have caregiver demonstrate doff/don.
- Education in DVT prevention and s/s of blood clots.
- Grooming:
  - Tolerate standing activity sink side to complete grooming/oral cares at modified independent.
- Toileting:
  - Transfer, hygiene, and clothing management at modified independent.

#### POD 0-3

##### Evaluation

- Pain

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- ROM
- Quad contraction, LE strength
- Ambulation/transfers
- ADLs
- Edema
- Patient-reported Outcome Measures – KOOS, JR

### ROM

- Manual
  - Consider Joint Mobilization: Patellar, PA/AP tibial mobilization (grades I/II), Soft Tissue Mobilization
- Therapeutic exercise
  - Heel slides
  - Seated knee flexion
  - Knee extension hangs (supine, prone)
  - Ankle pumps
- Stationary bike
  - Rocking - > rotations

### Strengthening (Phase 1)

- Breathing exercises
- Ankle pumps
- Gluteal Sets
- Quad Sets
- Heel slides
- Supine hip abduction
- Terminal knee extension/Short arc quad
- Straight leg raise (active/active assisted)
- Knee flexion- seated
- Adductor sets
- Long arc quad/knee extension

### Gait Training

- Use of Assistive Device, normalize gait pattern, improve weight bearing
  - Emphasis on heel strike, push off at toe-off, normal knee excursions
  - Proper fit of equipment. Best choice of FWW due to improved household ambulation speed compared to standard and improved stability compared to 4WW.

### Edema Management

- Compression – Tetra Grip, ACE wrap, T.E.D stockings
- Massage
- Cryotherapy
- Electrical Stimulation

### Positioning

- Avoid pillow under knee
  - Turning every 2 hours from supine > side lying

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- Towel placed at the ankle to promote knee extension when in supine or seated Step

### Phase 2 – Sub – Acute (Week 1-4)

#### Goals

- ROM 0-105 degrees
- 75% independent with HEP

#### Week 1-4

- Office visits
- See MD's nurse at 2-2.5 weeks

#### Evaluation:

- Pain
- Incision/swelling
- ROM – focus on full active extension
- Patellar mobility
- Quad contraction, LE strength
- Ambulation/transfers
- Patient-reported OM – KOOS

#### Treatment:

##### Wound

- Scar tissue mobilization until incision moves freely over subcutaneous tissue
  - Education on home completion

##### ROM

- Manual
  - Joint mobilizations (grade I-II for pain, Grade III-IV for improving motion)
    - Tibiofemoral joint position into restricted motion
      - Posterior glide to increase flexion
      - Anterior glide to increase extension
    - Patellofemoral joint position into restricted motion
      - Distal/inferior glide to increase flexion
      - Proximal/superior glide to increase extension
      - Medial/lateral glide for patellar mobility
  - PROM
  - Contract relax soft tissue mobilization
  - IASTM as indicated
  - Myofascial release

##### Strengthening

- Therapeutic exercise: Quad most important then hamstring. Focus on all lower extremity musculature including hip and ankle
  - Utilize NMES over quadricep paired with active exercises
- Ankle pumps
- Quad Sets
- Terminal knee extension/Short arc quad
- Straight leg raise (active/active assisted)

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- Prone terminal knee extension
- Prone knee extension hangs
- Standing terminal knee extension
- Heel slides
- Knee flexion- seated
- Adductor sets
- Long arc quad/knee extension
- Step ups
- Squats
- Hamstring
- Closed chain
- Bike
- Hip strengthening- non weight bearing and weight bearing

### Flexibility and stretching

- Quadricep, hamstring, hip flexor, psoas, gastroc, IT band, adductor- multi plane stretching

### Gait

- Progressing out of assistive device, normalize gait, improving weight bearing
  - Assistive device discontinues when patient demonstrates adequate lower extremity strength/ balance during functional activities
  - Stairs when patient demonstrates sufficient concentric and eccentric strength

### Balance training

- Side stepping (week 1-2)
- Braiding activities (week 1-4)
- Tandem walk (week 2-4)
- Cross-over steps (week 3-5)
- Shuttle walking (week 3-5)

### Modalities

- BFR-
- NMES- if atrophy or poor quadricep contraction
- ES- for edema if present

### Patient Education

- Foot wear, need for over the counter or custom orthotics to aide in alignment

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### Phase 3 – Return to Function (week 5-8)

#### Goals for Phase 3

- Range of motion 0-120
- Strength 4+/5 for all lower extremities
- Normalized gait
- 100% independence with home exercise program
- Fitness/wellness program
- Return to activities
  - Low impact aerobics, bowling, golf, dancing, walking, swimming

#### Evaluation

- Pain
- Incision/swelling
- Range of motion
- Patellar mobility
- Quadricep contraction/ lower extremity strength
- Ambulation/ transfers
- Patient reported outcome measure- KOOS

#### Treatment

##### Range of motion

- Same as phase II

##### Manual Joint mobilizations

- Tibiofemoral
- Patellofemoral
- Contract-Relax
- Soft tissue mobilization-IASTM as indicated, myofascial release

##### Strengthening

- Same as phase II
- Weight machines- emphasize hip/glut strength
- Step

##### Gait Training

- Normalize gait on various surfaces

##### Balance Training

- Cross-over steps
- Shuttle walking
- Multiple changes in direction (week 4-6)
- Foam activity (week 4-6)
- BAPS board or tilt board (week 6-8)
- Balance beam forward and backward walk

##### Modalities

- BFR- at therapist discretion
- NMES- if atrophy or poor quadricep contraction
  - Pulse width 20-60  $\mu$ sec, freq 30-50 pps, intensity to tolerance + a little more, Time 10-30 min (on 5 sec, off 5 sec), daily (5x/week)
- ES- for edema if present  
Pulse width 200-400 $\mu$ sec, freq 5 pps, intensity: strong but tolerable contractions, duration: 30 minutes, 2 x/day best, 1

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electrode over 1-2 muscle distal to edema and other electrode over 1-2 muscles proximal to edema

### Same Day

#### Goals

- Ambulate within 8 hours of arriving to PACU
- Safe Ambulation
- Safe stair navigation
- Should have attended Prehab
- Assess need for OT evaluation

#### Same Day PT

- Recovery nurse communicating via secure chat, awaiting sensation and strength to return to thighs and buttocks
- Blood pressures taken in supine, sitting and standing
- Patient stable- can be seen by physical therapist
- Safe transfers, ambulation and stairs for home navigation

#### Education

- Car transfers
- Assistive device use
- Positioning
- Activity guidelines
- HEP

This protocol was updated and reviewed by Orthopedics & Sports Medicine BayCare Clinic Manitowoc, Luke Kiel, DPT, Erin Daschke, DPT, Laura Waalkens ATC, PTA, Megan Siebod, PTA and Gabby Atkins, DPT on June 2024.

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