DR. CARL DIRAIMONDO / DR. BRIAN KURCZ / DR. CRAIG OLSON
TOTAL KNEE ARTHROPLASTY POST-OP THERAPY PROTOCOL

Patient is highly encouraged to attend joint school 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 x2 days)
(continued on next page)

Goals for Phase 1	**Precautions for Phase 1:**
• ROM 0-90 • Safe car transfer • Stair negotiation • Household distance ambulation	• No twisting/pivoting upon leg

PT Goals – POD 1
- Perform bed mobility modified independently per home setup
- Perform transfers modified independently from all surfaces
- Complete car transfer training
- Ambulate 150 feet modified independently to demonstrate household distances
- 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)
  - Complete full shower at modified independent, sitting/standing depending on plan to sit/stand at home
- 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 T.E.D.s 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
- ROM
- Quad contraction, LE strength
- Ambulation/transfers
- ADLs
- Edema
- Patient-reported OM – KOOS, JR

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Phase 1 – Acute (POD 0-1, hospital discharge x2 days)

ROM

- Manual
  - Consider joint mobilization: patellar, PA/AP tibial mobilization (grade 1-2) soft tissue mobilization
- Therapeutic exercise
  - Heel slides
  - seated knee flexion
  - knee extension hangs (supine, prone)
  - ankle pumps
- Stationary bike
  - Rocking → rotations

Strengthening

- Aurora Rehab Book Exercises for phase 1:
  - Breathing exercises
  - Glute sets
  - Quad sets
  - Supine hip abduction
  - Terminal knee extension/short arc quad
  - Straight leg raise (active/active assisted)
  - Adductor sets
  - Long arc quad/knee extension
  - Sitting push ups

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 improvised stability compared to 4WW.

Edema Management

- Compression – Tetragrip, ACE wrap, T.E.D. stockings
- Massage
- Cryotherapy
- Electrical stimulation

Positioning

- Avoid pillow under knee
  - Turning every 2 hours from supine to side lying
  - A towel should be placed at the ankle to promote knee extension when supine in bed

Nutrition

- Aurora Handout – *Wound Healing Nutrition Guidelines*

Phase 2 – Sub-Acute (1-4 weeks)

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Goals for Phase 2
- ROM 0-105 degrees
- 75% independent with HEP

Office Visits
- See physician's nurse at 2-2.5 weeks 2x/week unless otherwise stated by physician

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

Wound
- Scar tissue mobilization until incision moves freely over subcutaneous tissue with education on home completion

ROM
- Manual
  - Joint mobilizations (grade 1-2 for pain, grade 3-4 for increasing 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 **(continued on next page**)
- Therapeutic exercise: quad is most important, then hamstring; important to also focus on all lower extremity musculature including hip and ankle.
  - Utilize NMES over the quadricep paired with active exercise
- Quadriceps isometrics
- SAQ
- SLR
- LAQ
- Prone TKE
- Standing TKE
- Step ups

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Phase 2 – Sub-Acute (1-4 weeks)

- Squats
- Heel slides
- Knee flexion seated
- Knee extension hangs
- Ankle pumps
- Bike
- Closed chain
- Hamstring
- Hip strengthening, non-weight bearing and weight bearing

Flexibility and Stretching

- Quadricep, hamstring, hip flexor, psoas, gastroc, IT Band, adductor – work into multiplane stretching

Gait

- Progress out of assistive device, normalize gait, improving weight bearing
    - AD are discontinued when patient demos adequate LE strength/balance during functional activities
    - Stairs when patient has sufficient concentric/eccentric strength

Balance Training

- **1-2 weeks:** side stepping
- **1-4 weeks:** braiding activities
- **2-4 weeks:** tandem walk
- **3-5 weeks**: cross-over steps
- **3-5 weeks:** shuttle walking

Modalities

- NMES* if atrophy or poor quad contraction present
- ES+ for edema if edema present

Patient Education

- Footwear, need for OTC/custom orthotics to aide in alignment

* Pulse width 20-60 µsec, freq 30-50 pps, intensity to tolerance + a little more, Time 10-30 min (on 5 sec, off 5 sec), daily (5x/week)

+ Edema: Pulse width 200-400µsec, freq 5 pps, intensity: strong but tolerable contractions, duration: 30 minutes, 2 x/day best, 1 electrode over 1-2 muscle distal to edema and other electrode over 1-2 muscles proximal to edema

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Phase 3 – Return to Function (5-8 weeks)

(continued on next page)

Goals for Phase 3

- ROM 0-120
- Strength 4+/5 for all lower extremities
- Normalized gait
- 100% Independent with HEP
- Fitness/wellness program
- Return to activities
    - Low impact aerobics, bowling, golf, dancing, walking, swimming

Evaluation

- Pain
- Incision/swelling
- ROM
- Patellar mobility
- Quad contraction, LE strength
- Ambulation/transfers
- Patient reported OM – LEFS/KOOS

ROM

- Same as phase 2

Manual Joint Mobilizations

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

Strengthening

- Same as phase 2
- Weight machines, continue to emphasize hip/glute strength

Gait Training

- Normalize gait on various surfaces, stairs

Balance Training

- Cross-over steps
- Shuttle walking
- **4-6 weeks:** multiple changes in direction
- **4-6 weeks:** foam activity
- **6-8 weeks:** BAPS board or tilt board
- Balance beam forward and backward walk

Phase 3 – Return to Function (5-8 weeks)

Modalities

- BFR
- NMES* if atrophy or poor quad contraction present
- ES+ for edema if edema present

* Pulse width 20-60 µsec, freq 30-50 pps, intensity to tolerance + a little more, Time 10-30 min (on 5 sec, off 5 sec), daily (5x/week)

+ Edema: Pulse width 200-400 µsec, freq 5 pps, intensity: strong but tolerable contractions, duration: 30 minutes, 2 x/day best, 1 electrode over 1-2 muscle distal to edema and other electrode over 1-2 muscles proximal to edema