Beth Israel Lahey Health
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Rehabilitation Protocol:

Total Knee Arthroplasty (TKA)

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◄ Overview

Total knee arthroplasty (TKA) is an elective operative procedure to treat an arthritic knee. This procedure replaces your damaged knee joint with an artificial knee implant. Knee implants consist of (1) a metal piece attached to the end of your thigh bone, (2) a metal and plastic or all-plastic piece attached to the top of your lower leg bone and (3) a plastic piece attached to your kneecap. Once in place, the artificial components function like your natural knee.

The surgical approach to knee replacement surgery requires that appropriate healing is allowed to take place. There are certain milestones during rehabilitation that require that the patient be an active participant in rehabilitation to help ensure the best outcome. The goals of this surgery are to decrease pain, maximize function of ADLs, reduce functional impairments and maximize quality of life.

◄ Phase I Protective Phase 0−1 Week, Hospital Stay

Goals

- Allow soft tissue healing
- Reduce pain, inflammation, and swelling
- Increase motor control and strength
- Increase independence with bed mobility, transfers, and gait
- Educate patient regarding weight bearing
- Patient to work toward full passive knee extension at 0 º and work toward increasing flexion ROM to 90 º

Precautions

- Patients are generally WBAT with assistive device for primary TKA, unless otherwise indicated by MD
- Keep incision clean and dry
- No showering until staples out and MD approves
- Coordinate treatment times with pain medication
- While in bed, patient to be positioned with towel roll at ankle to prevent heel ulcers and promote knee extension
- Observe for signs of deep vein thrombosis (DVT): increased swelling, erythema, calf pain. If present, notify MD immediately

Post-op Days (POD) 1–4

- PT evaluation and initiation of ROM on POD#0
- Patient to be seen by PT 2x/day, thereafter
- Cold pack or ice pack to manage pain, inflammation, and swelling
- Patient education for positioning and joint protection strategies
- Therapeutic exercises in supine: passive and active assist heel slides, ankle pumps, quadriceps and gluteal sets, short arc quadriceps (SAQ)
- Therapeutic exercises in sitting: Passive/Active Assist/Active knee extension/flexion
- Bed mobility and transfer training
- Gait training on flat surfaces and on stairs with appropriate assistive device per discharge plan
- Physical therapist to coordinate patient receiving appropriate assistive device for home discharge.
- OT evaluation- seen on consultant basis. Patients being discharged home prioritized. Orders obtained during daily rounds or page MD for orders as needed.

◄ Phase II – Transitional Phase (Guided by home or rehab therapist) Weeks 1-3

Goals

- Allow healing/follow precautions
- Reduce pain, inflammation, and swelling
- Increase range of motion (ROM): work toward achieving full knee extension at 0º and flexion ROM between 90-120º
- Increase strength
- Increase independence with bed mobility, transfers, and gait
- Gait training – Appropriate use of assistive device to emphasize normal gait pattern and limit post-operative inflammation

Precautions

- Monitor wound healing for signs and symptoms of infection. If present, notify MD

Therapeutic Exercise (To be performed 3x/day after instruction by therapist)

- Passive/Active Assisted/Active range of motion (P/AA/AROM) exercises in supine: ankle pumps, heel slides.
- P/ AA/AROM exercises in sitting: long arc quads, ankle pumps. Including therapist assist for increasing ROM into flexion and full extension.
- Strengthening: Quadriceps setting in full knee extension, gluteal setting, short arc quadriceps (SAQ), hooklying ball/towel squeeze, bridging.
- Bed mobility and transfer training

Gait Training

- Continue training with assistive device. Wean from walker to crutches to cane only when patient can make transition without onset of gait deviation.
- Encourage all normal phases of gait pattern using appropriate device.

Modalities

- Cold pack or ice pack for 10-15 minutes 3x/day to manage pain, inflammation, and swelling

Criteria for progression to next phase:

- Minimal pain and inflammation
- Pt ambulates with assistive device without pain or deviation
- Independent with current daily home exercise regimen
- Progression to driving: must be off all narcotic analgesics in order to concentrate on driving tasks. Discuss specifics with surgeon

◄ Phase III – Outpatient Early Phase (Weeks 3-6, guided by outpatient physical therapist)

Goals

- Reduce pain and inflammation
- Increase range of motion (ROM) gradually progressing toward 0-120º
- Increase strength with emphasis on hip abductor/extensor and quad/hamstring musculature
- Balance and proprioceptive training to assist with functional activities
- Gait training: Wean off assistive device when patient can ambulate without deviation
- Functional activity training to enhance patient autonomy with ADLs/mobility

Precautions

- Continue to monitor wound healing for signs and symptoms of infection

Therapeutic Exercise progression of exercise from Phase II (To be guided by outpatient physical therapist)

- Stationary Bike
- 4-way straight leg raise (SLR)
- Closed chain weight shifting activities including side-stepping
- Balance exercises: single leg stance, alter surface, eyes open/closed
- Leg press; wall slides
- Lateral step up and step down with eccentric control
- Front step up and step down

Functional Activities

- Sit to stand activities
- Lifting and carrying
- Ascending/descending stairs
- Gait Training

Modalities

- Cold pack or ice pack for 10-15 minutes 1-3x/day to manage pain and swelling
- Neuromuscular Electrical Stimulation (NMES) for quadriceps re-education as necessary

Criteria for progression to next phase:

- Minimal pain and inflammation
- Pt ambulates without assistive device without pain or deviation
- Good voluntary quad control

◄ Phase IV – Outpatient Intermediate Phase (Weeks 6-12, guided by outpatient physical therapist)

Goals

- Increase overall strength throughout lower extremities
- Return to all functional activities
- Begin light recreational activities

Therapeutic Exercise

- Progress **Phase III** exercises by increasing resistance and repetitions
- Front lunge and squat activities
- Progress balance and proprioception activities (STAR and ball toss, perturbations)
- Initiate overall exercise and endurance training (walking, swimming, progress biking)

Criteria for discharge

- No pain with functional activities of daily living
- Good lower extremity strength of >= 4/5 throughout
- Patient is independent with reciprocal stair climbing
- Patient consistently adheres to plan of care and home exercise program

◄ Phase V – Return to High Level Activity (3+ months)

Activities

- Continue walking, swimming and biking programs for aerobic conditioning/endurance
- Begin playing golf and outdoor cycling
- Obtain clearance from surgeon for return to impact sports such and tennis or jogging

Rehabilitation Protocol for Total Knee Arthroplasty

Post –op Phase/Goals	Interventions/Activities	Precautions
Phase I **Protective Phase** **0- 1 Week** **Hospital Stay** Allow soft tissue healing Reduce pain, inflammation, and swelling Increase motor control and strength Increase independence with bed mobility, transfers, and gait Educate patient regarding weight bearing Patient to work toward full passive knee extension at 0 º and work toward increasing flexion ROM to 90º	• PT evaluation and initiation of ROM on POD#0 • Patient to be seen by PT 2x/day, thereafter • Cold pack or ice pack to manage pain, inflammation, and swelling • Patient education for positioning and joint protection strategies • Therapeutic exercises in supine: passive and active assist heel slides, ankle pumps, quadriceps and gluteal sets, short arc quadriceps (SAQ) • Therapeutic exercises in sitting: Passive/Active Assist/Active knee extension/flexion • Bed mobility and transfer training • Gait training on flat surfaces and on stairs with appropriate assistive device per discharge plan • Physical therapist to coordinate patient receiving appropriate assistive device for home discharge. • OT evaluation- seen on consultant basis. Patients being discharged home prioritized. Orders obtained during daily rounds or page MD for orders as needed.	Patients are generally WBAT with assistive device for primary TKA, unless otherwise indicated by MD Keep incision clean and dry No showering until staples out and MD approves Coordinate treatment times with pain medication While in bed, patient to be positioned with towel roll at ankle to prevent heel ulcers and promote knee extension Observe for signs of deep vein thrombosis (DVT): increased swelling, erythema, calf pain. If present, notify MD immediately

Post –op Phase/Goals	Interventions/Activities	Precautions
Phase II – Transitional Phase (Guided by home or rehab therapist) **Weeks 1 - 3** Allow healing/follow precautions Reduce pain, inflammation, and swelling Increase range of motion (ROM): work toward achieving full knee extension at 0º and flexion ROM between 90-120º Increase strength Increase independence with bed mobility, transfers, and gait Gait training – Appropriate use of assistive device to emphasize normal gait pattern and limit post-operative inflammation	(To be performed 3x/day after instruction by therapist) • Passive/Active Assisted/Active range of motion (P/AA/AROM) exercises in supine: ankle pumps, heel slides. • P/ AA/AROM exercises in sitting: long arc quads, ankle pumps. Including therapist assist for increasing ROM into flexion and full extension. • Strengthening: Quadriceps setting in full knee extension, gluteal setting, short arc quadriceps (SAQ), hooklying ball/towel squeeze, bridging. • Bed mobility and transfer training <u>Gait Training</u> • Continue training with assistive device. • Wean from walker to crutches to cane only when patient can make transition without onset of gait deviation. • Encourage all normal phases of gait pattern using appropriate device. <u>Modalities</u> • Cold pack or ice pack for 10-15 minutes 3x/day to manage pain, inflammation, and swelling <u>Criteria for progression to next phase:</u> • Minimal pain and inflammation • Pt ambulates with assistive device without pain or deviation • Independent with current daily home exercise regimen • Progression to driving: must be off all narcotic analgesics in order to concentrate on driving tasks. Discuss specifics with surgeon	Monitor wound healing for signs and symptoms of infection. If present, notify MD

Post –op Phase/Goals	Interventions/Activities	Precautions
Phase III – Outpatient Early Phase (Weeks 3-6, guided by outpatient physical therapist) • Reduce pain and inflammation • Increase range of motion (ROM) gradually progressing toward 0-120º • Increase strength with emphasis on hip abductor/extensor and quad/hamstring musculature • Balance and proprioceptive training to assist with functional activities • Gait training: Wean off assistive device when patient can ambulate without deviation Functional activity training to enhance patient autonomy with ADLs/mobility	Therapeutic Exercise progression of exercise from Phase II (To be guided by outpatient physical therapist) • Stationary bike • Four way straight leg raise • Closed chain weight shifting activities including side-stepping • Balance exercises: single leg stance, alter surface, eyes open/closed • Leg press; wall slides • Lateral step up and step down with eccentric control • Front step up and step down Functional Activities • Sit to stand activities • Lifting and carrying • Ascending/descending stairs • Gait Training Modalities • Cold pack or ice pack for 10-15 minutes 1-3x/day to manage pain and swelling • Neuromuscular Electrical Stimulation (NMES) for quadriceps re-education as necessary Criteria for progression to next phase: • Minimal pain and inflammation • Pt ambulates without assistive device without pain or deviation • Good voluntary quad control	Continue to monitor wound healing for signs and symptoms of infection

Post –op Phase/Goals	Interventions/Activities
Phase IV – Outpatient Intermediate Phase (Weeks 6-12, guided by outpatient physical therapist)	
• Increase overall strength throughout lower extremities • Return to all functional activities • Begin light recreational activities	Therapeutic Exercise Progress **Phase III** exercises by increasing resistance and repetitions Front lunge and squat activities Progress balance and proprioception activities (STAR and ball toss, perturbations) Initiate overall exercise and endurance training (walking, swimming, progress biking) Criteria for discharge No pain with functional activities of daily living Good lower extremity strength of >= 4/5 throughout Patient is independent with reciprocal stair climbing Patient consistently adheres to plan of care and home exercise program

Phase V – Return to High Level Activity (3+ months)	Continue walking, swimming and biking programs for aerobic conditioning/endurance Begin playing golf and outdoor cycling Obtain clearance from surgeon for return to impact sports such and tennis or jogging