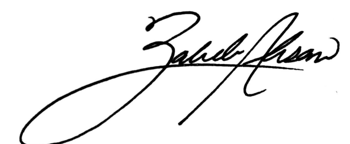
Healthy Driven
Edward-Elmhurst
MEDICAL GROUPS

Orthopedics

PATELLOFEMORAL JOINT REPLACEMENT GUIDELINES

The following patellofemoral joint replacement guidelines were developed by Hospital for Special Surgery Rehabilitation. **Progression is both criteria-based and patient specific. Phases and time frames are designed to give the clinician a general sense of progression.** The rehabilitation program following patellofemoral joint replacement emphasizes early, controlled motion to prevent knee stiffness and to avoid disuse atrophy of musculature. The program should balance the aspects of tissue healing and appropriate interventions to maximize flexibility, strength, and pain-free performance of functional activities.

FOLLOW PHYSICIAN'S MODIFICATIONS AS PRESCRIBED.



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Pre-Operative Phase

PRECAUTIONS	▪ Avoid prolonged sitting, standing, and walking if painful ▪ Avoid severe pain with walking, ROM and strengthening exercises ▪ Modify or minimize activities that increase pain
ASSESSMENT	▪ Lower Extremity Functional Scale (LEFS) ▪ Knee injury and Osteoarthritis Outcome Survey Junior (KOOS JR) ▪ Pain ▪ AROM/PROM ▪ Single leg stance (SLS) ▪ Quadriceps activation ▪ Flexibility ▪ Gait ▪ Proximal strength
TREATMENT RECOMMENDATIONS	▪ ROM/Flexibility of lower extremity (LE) ▪ LE strengthening ▪ Core strengthening ▪ Balance training ▪ Independent with home exercise program that addresses primary impairments ▪ Familiarization with post-operative plan of care, mobility
CRITERIA FOR ADVANCEMENT	▪ Maximize pain free flexibility/ROM in pain-free range ▪ Increase LE and core strength prior to surgery, e.g., quadriceps contraction, gluteal contraction ▪ Increase balance prior to surgery ▪ Patient able to verbalize post-operative plan of care including to avoid AROM knee extensions
EMPHASIZE	▪ Familiarize with post-operative plan of care

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Post-Operative Acute Care Phase (Week 1)

PRECAUTIONS	▪ Avoid prolonged sitting, standing, and walking ▪ Avoid severe pain with walking and ROM exercises ▪ Do not put a pillow under the knee – keep extended when resting ▪ Avoid active knee extension (short and/or long arc quads)
ASSESSMENT	▪ Mental status ▪ Pain ▪ Wound status ▪ Swelling ▪ AAROM/PROM of knee ▪ Post-anesthesia sensory motor screening ▪ Functional status
TREATMENT RECOMMENDATIONS	▪ Promotion of passive knee extension activities ▪ Emphasize quadriceps setting with towel underneath knee ▪ Transfer training: in and out of bed, sit to stand – chair, toilet ▪ Gait training with appropriate device on level surfaces and stairs ▪ ADL training ▪ Cryotherapy ▪ Elevation of LE to prevent swelling (above level of heart if able) ▪ Therapeutic exercise with focus on AA/PROM, active quadriceps contraction, and muscle pumping (ankle pumps, quadriceps sets, gluteal sets) ▪ Initiate and emphasize importance of home exercise program
CRITERIA FOR ADVANCEMENT	▪ Active assisted flexion ~80˚ in sitting and passive extension <5˚ in supine ▪ Good pain control ▪ Ambulates with appropriate device safely on level surface and negotiate stairs safely ▪ Independent with transfers ▪ Independent with home exercise program ▪ Discharge home within 0-2 days when goals have been achieved and with MD clearance
EMPHASIZE	▪ Control swelling ▪ Independent transfers ▪ Gait training ▪ ROM (emphasize passive extension) ▪ Quadriceps setting

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Post-Operative Phase I (Weeks 2-6)

PRECAUTIONS	▪ If ROM plateaus with hard end feel, contact MD ▪ Use appropriate assistive device if gait deviation is present during ambulation ▪ Avoid prolonged sitting and ambulation ▪ Avoid active knee extension (short and/or long arch quads) ▪ Do not put a pillow under the knee ▪ Avoid pain with therapeutic exercise and functional activities ▪ Avoid reciprocal stair negotiation until strength and control of the operated limb is restored
ASSESSMENT	▪ Pain ▪ LE AROM/PROM ▪ LE flexibility ▪ Strength – MMT and quality of quadriceps contraction ▪ SLS ▪ Timed Up and Go (TUG) ▪ SLR (monitor extensor lag) ▪ Gait ▪ Edema measurement ▪ Patella mobility
TREATMENT RECOMMENDATIONS	▪ ROM/Stretching o PROM/AAROM extension exercises, knee flexion PROM/AAROM/AROM (with hip flexed), ankle DF, stretching of appropriate muscle groups ▪ Strengthening o SLS in all planes (without extension lag); prioritize quadriceps, hip, hamstring strength ▪ Endurance o Cycle ergometry: short crank is >90˚, normal crank is >110˚ at the knee ▪ Modalities o Cryotherapy/elevation/modalities may be used to help control swelling and pain o Electrical stimulation or biofeedback may be used for quadriceps re-education ▪ Patella mobilization when incision is stable ▪ Forward step up progression at 2" if appropriate quadriceps contraction and good quality of movement ▪ Balance training ▪ Gait training with/without assistive device with emphasis on active knee flexion and extension, heel strike, reciprocal pattern, symmetrical weight bearing, eccentric quadriceps control in loading response ▪ ADL training to continue such as sit to stand, in/out of tub/shower, car transfer ▪ Patient education regarding response to increased activity level
CRITERIA FOR ADVANCEMENT	▪ AROM **>110˚ knee flexion, knee extension = 0˚** ▪ No quadriceps lag ▪ Ambulate on level surface with/without assistive device with normal gait pattern ▪ **Sit to stand transfers independent with even weight bearing status through bilateral lower extremities using hand or cushion as needed** ▪ **Independent with ADLs** ▪ **Independent with home exercise program** ▪ **Good pain control**
EMPHASIZE	▪ Decrease swelling ▪ Increase flexibility ▪ Active quadriceps contraction ▪ Normalize gait

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Post-Operative Phase II (Weeks 7-16)

PRECAUTIONS	▪ Avoid active knee extension (short and/or long arc quads)
	▪ Avoid reciprocal stair negotiation if pain or gait deviation present
	▪ Avoid high impact activities such as running, jumping, plyometric activity and vibration platforms
	▪ Avoid pain with therapeutic exercise, standing, walking and other activities
	  ○ Monitor tolerance to load, frequency, intensity and duration
	  ○ Avoid too much too soon

ASSESSMENT	▪ Pain ▪ LE AROM/PROM ▪ Strength – MMT ▪ Patella mobility ▪ Sit to stand form ▪ Step up starting at 2”

TREATMENT RECOMMENDATIONS	▪ Continue phase 1 manual/exercise treatments as needed
	▪ Stretching/foam rolling of quadriceps, hamstring and appropriate muscles groups
	▪ Leg press: bilateral, unilateral, eccentric
	▪ Continue step up/step down progression (2”→8”)
	▪ Body weight squats with hip strategy
	▪ Retro treadmill, forward treadmill, elliptical, upright bicycle with emphasis on quadriceps activation
	▪ Gait training
	▪ Transfer training (especially up and down from the floor)
	▪ Progress bilateral → unilateral balance
	▪ Initiate low impact agility exercises if strength adequate
	▪ Review patient’s preferred exercise routine for safety/modifications
	▪ Aquatic exercise/hydro therapy if accessible when incision healed and cleared by MD
	  ○ Address gait deviations (forward, retro ambulation)
	  ○ Strengthening: sidesteps, standing leg lifts with ankle weights, double limb squats, step ups, standing hip/knee extension with noodle under foot, calf raises (if applicable utilizing laminar flow to provide resistance)
	  ○ Balance: SLS activity with upper extremity/LE movements
	  ○ Core stability: noodle push downs, medicine ball trunk rotation
	  Flexibility: address patient flexibility needs

CRITERIA FOR DISCHARGE	▪ **Active flexion > 120° in sitting, knee extension = 0°** ▪ **Bilateral ankle dorsiflexion > 10°** ▪ **Functional test measures within age appropriate parameters including symmetrical squat** ▪ **Negotiate steps with reciprocal pattern: ascending stairs 6+”, descending 6+” with minimal pain** ▪ **LE strength 4+/5, control, and flexibility for high level ADL activities** ▪ **Independent with full home exercise program** ▪ **Discharge OR progress to Phase III if the goal is to return to sport or advance functional activities (as cleared by MD)**
EMPHASIZE	▪ Increase flexibility ▪ Restore strength ▪ Resume uninhibited ADLs

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Post-Operative Phase III (Weeks 17-24+)
Begin ONLY if returning to sport with MD clearance

PRECAUTIONS	▪ Avoid active knee extension (short and/or long arc quads) ▪ Avoid high impact ▪ Note that expert opinion varies widely on allowable sports – consult with MD
ASSESSMENT	▪ LEFS ▪ KOOS JR ▪ Pain ▪ LE AROM ▪ LE Flexibility ▪ LE strength, especially eccentric quadriceps strength ▪ SLS ▪ Form and fatigue during sport specific movement
TREATMENT RECOMMENDATIONS	▪ Activity specific training ▪ Continue stretching/foam rolling of quadriceps, hamstring and appropriate muscle groups ▪ Eccentric quadriceps strengthening ▪ Progressive resistance exercises (strength endurance and strength power) ▪ Low impact cardiovascular conditioning ▪ Low impact agility drills ▪ Dynamic balance activities ▪ Sports specific warm up and activities ▪ Consider collaboration with ATC, performance coach/strength and conditioning coach, skills coach and/or personal trainer for complex sports specific movements if available
CRITERIA FOR DISCHARGE	▪ Maximize pain free flexibility/ROM in pain-free range ▪ Increase LE and core strength prior to surgery, e.g., quadriceps contraction, gluteal contraction ▪ Increase balance prior to surgery ▪ Patient able to verbalize post-operative plan of care including to avoid AROM knee extensions ▪ Consider collaboration with ATC, performance coach/strength and conditioning coach, skills coach and or personal trainer for complex sports specific movements if available
EMPHASIZE	▪ Return to sport/recreational activity ▪ Neuromuscular patterning ▪ Gradual increase of loads to meet sports specific demands