Outpatient Rehabilitation Guidelines for MAKOplasty Unicompartmental Knee Arthroplasty (UKA)

The following rehabilitation guidelines are presented in a criterion based progression. General time frames are given for reference to the average, but individual patients will progress at different rates depending on their age, associated injuries, pre-injury health status, motivation, rehabilitation compliance and injury severity. Specific time frames, restrictions and precautions may also be given to protect healing tissues and the surgical reconstruction. The full rehabilitation program may not be necessary; it will depend on the patient's goals and desired activities.

Basic Principals for the Patient and Therapist

1. General: Inpatient hospitalization could be 23 hours to 3 days, and outpatient therapy should start as soon as possible. These patients usually do not need skilled nursing facility placement and therefore are encouraged to schedule outpatient (OP) physical therapy (PT) well in advance of the surgery. If patients schedule two PT appointments for the week following surgery, they will be seen promptly, even if their hospitalizations are longer than initially planned. It is recommended that patients have PT set up twice weekly for 2 weeks after evaluation, and then as needed based on evaluation findings and rate of progress.
2. These patients will have smaller incisions, and possibly less bony trauma associated with the surgery itself, due to the robotic control of depth of cut, etc. Pain and swelling may be less than is typical due to this technique. All Range of Motion (ROM) for knee flexion and extension should be measured in supine for consistency and accuracy.
3. Return to Sports: Once rehabilitated, impact activities are not recommended. Activities that are allowed are bicycling, golfing, walking, rowing (if flexion range allows), swimming, use of elliptical trainer and other non-impact walking-like training. Classic cross country skiing is allowed, but patients should check with their surgeons about skate skiing.

PHASE I (surgery to about 3 weeks after surgery)

Appointments	• Start as early as post-operative day (POD) 2, with continuation of inpatient (IP) exercises if any lag time between hospital discharge and starting outpatient PT (Could be over weekend) • Frequency of OP PT should be 2-3 times weekly to start for all patients, for a minimum of 2 weeks, depending on range of motion (ROM) progress

Rehabilitation Goals and Priorities	• Priority placed on Quad function, ROM and minimizing edema
	• By 5-6 days after surgery:
	  ◦ ROM: 90° Flexion
	  ◦ Strength: Ability to perform a straight leg raise (SLR)
	  ◦ Edema: Evaluation and education on home management with elevation and ice
	• By 0-3 weeks after surgery:
	  ◦ ROM: Full Extension, 110-120° Flexion (flexion to be equal to or greater than pre-operative range)
	  ◦ Gait: with weight bearing as tolerated (WBAT) safely in home and stairs
	  ◦ Patients will be WBAT/ full weight bearing (FWB). Encourage use of an assistive device until no limping is present, and full extension at heel strike is present

Precautions	• Use assistive device(s) for normal gait, WBAT; Incision protection
ROM Exercises	• Supine heel slides, gravity assisted flexion sitting at edge of bed, supine heel props for gravity assisted extension, hip flexion, ankle dorsiflexion and plantarflexion • Encourage self-directed range of motion beyond premature end point with education on hurt versus harm; this can be done on supine leg press if light enough resistance is available (20-60 lbs); unaffected leg can be used for active assisted range of motion (AAROM) on this as well • Stationary bike full or partial revolutions, minimal to no resistance
Suggested Therapeutic Exercise/Treatment	• Quadriceps set, SLR, ankle pumps, hip abduction, short arc quadriceps, standing hip active range of motion (AROM) with and without bands • If edema is problematic, quad sets need to be done in elevated position while at home • Patellar mobilization • Possible options: Standing mini-squats, calf raises, use of supine shuttle with light resistance through available range, weight shifting, reciprocal stairs if possible, but no unilateral leg loading in lunge-like positions for 8 weeks
Cardiovascular	• Upper body circuit training or upper body ergometer if patient desires
Progression Criteria	• Normal gait with assistive device on level indoor surfaces • No extensor lag • Full proximal hip strength • Double leg squat to 45° knee flexion

PHASE II (begin after meeting Phase I criteria, usually 3-6 weeks after surgery)

Appointments	• Physician appointment at 6 weeks after surgery • Rehabilitation appointment based on patient progress, 1-2 times every week
Rehabilitation Goals and Priorities	• Regain muscular strength (focus on quadriceps) • Progress off assistive device for all surfaces and distances, if able • Reciprocal gait on stairs by 6 weeks • Knee flexion range at 6 weeks should be at 80-120% of what is expected for final outcome, depending of course on ROM going into surgery (range for these is 95°-145°; average 125°) • Double leg sit to stand from chair with no upper extremity assist • Single leg balance 15 seconds, or ability to put on socks in standing • Return to work by 6 weeks
Precautions	• Post-activity soreness should resolve within 24 hours • No impact activities
Suggested Therapeutic Exercise	• Progress exercises from Phase I to include increased resistance • Progress ROM exercises • Manual therapy to incision • Joint mobilization • Neuromuscular re-education to minimize substitution patterns
Cardiovascular Exercise	• Treadmill if tolerated, elliptical if tolerated, swimming if incision is healed/completely closed (not before 4 weeks in most cases, check with surgeon if unsure)
Progression Criteria	• Regain muscular strength (focus on quadriceps) • Progress off assistive device for all surfaces and distances, if able • Reciprocal gait on stairs by 6 weeks • Flexion ROM by 6 weeks should be 80-120% of normal (95°-145°; average 125°) • Double leg sit to stand with no upper extremity assist • Single leg balance 15 seconds, or ability to put on socks in standing

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PHASE III (begin after meeting phase II criteria, usually 6 weeks after surgery)

Appointments	• Rehabilitation based on patient progress, one time every 1-3 weeks although some patients may be independent by this point
Rehabilitation Goals and Priorities	• Improve muscular strength and endurance • Good control and no pain with all activities of daily living as well as work specific movements • Able to walk longer distances (1 mile) without a limp
Precautions	• Post-activity soreness should resolve within 24 hours • No impact activities
Suggested Therapeutic Exercise	• Strength and balance exercises with progression from double leg to single leg and single plane drills to multi-plane drills • Dynamic control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities • Work specific balance and proprioceptive drills • Progression of hip and core strengthening • Work on non-impact portions of sports allowed in those patients who wish to do so including tennis, classic cross country skiing and bowling
Cardiovascular Exercise	• Replicate sport or work specific energy demands (non-impact)
Return to non-impact sport/work criteria	• Normal gait on all surfaces, including longer distances (1 mile) • Dynamic neuromuscular control with multi-plane activities, without pain or swelling • Return to impact sports such as tennis, downhill skiing, and others will be discussed with surgeon and therapist • No impact activities will start before 6 months after surgery