

ARNOLD & COX KNEE AND SHOULDER CENTER

TOTAL KNEE REPLACEMENT

REHABILITATION PROTOCOL

This protocol should not be considered the final authority for the rehabilitation of a patient with a total knee replacement. Each patient presents with their own set of unique challenges, requirements, and expectations. Although each patient is expected to attain certain ROM and mobility achievements, we must not lose sight of the individual nature of each patient; 'cookie-cutter therapy' does not apply to any of our patients. The exercises in this protocol are specifically referred to as 'suggestions', and are in no way meant to supersede the clinical judgment of the physical therapist. Each patient's plan of care should be individualized to meet their specific needs.

General Rehabilitation Considerations:

- Time frames described in this protocol are considered approximate. Patients are unique individuals and are progressed based on their clinical presentation.
- CPM is to be used 6 hours per day, usually divided into 2 hour segments 3 times per day. The CPM should be advanced during each session, with the patient feeling the knee is stretching to its maximum.
- Extension. Most patients are aware of how important it is to bend their knee, but many patients need to be reminded how necessary full knee extension is to a normal gait pattern.
- Patients are weight bearing as tolerated (unless otherwise indicated) with a walker, crutches, or cane until they are able to demonstrate proper gait mechanics; emphasize 'heel-toe' gait pattern.
- The long leg immobilizer is to be worn whenever the patient ambulates until quad control is demonstrated. The brace may be D/C'd once patient can perform 10 SLR's without significant extension lag.
- TED hose are to be worn bilaterally until the patient is 'up more than down'. This usually lasts for as long as the patient is using the CPM. The patient may continue to wear TED hose on the involved side if it is felt the knee benefits from the added compression for management of swelling.
- Ace bandage/4X4's: As long as there is no drainage from the incision, this bandage may be D/C'd. However, the patient is instructed to continue 'painting' the incision with betadine until their first post-op visit.
- Steri strips: These typically fall off by themselves. If blisters are present under a steri strip, leave them alone and notify the physician's office.
- Bathing: Knee should be wrapped in water repellent material for the first post operative week. They may shower without the knee covered 1 week after surgery. It is okay for water, soap, and wash rag to move over the knee, but do not scrub the incision. After the

shower, gently pat the knee dry. The knee is not to be submerged under water until the incision is fully healed.

- Swelling: A critical aspect to manage during a patient's rehabilitation. Encourage the patient to ice and elevate their knee higher than their heart several times per day at 15-20 minute intervals. Many patients need to be shown what 'elevation higher than their heart' looks like. P-R-I-C-E: protection, rest, ice, compression, elevation
- Avoid excessive pain/soreness with exercise
- Avoid twisting on involved knee with weight bearing
- **No resisted leg extension machines (isotonic or isokinetic), squats, lunges, or straight leg raises at any point during rehabilitation.** Straight leg raises may only be used to assess quadriceps control.

Physician Notification:

The knee may appear swollen for several weeks and feel warm for several months after surgery. However, Dr. Arnold's office should be notified immediately if any of the following are observed:

- Significant redness and/or swelling around the knee or incision
- Red streaking
- Excessive bleeding or drainage from the incision
- Calf pain
- Patient reports difficulty breathing, chest pain, diaphoresis, or any other sign of a pulmonary embolism
- Patient is experiencing severe knee or leg pain
- Fever over 101 degrees F
- If patient fails to meet the expected goals for each protocol phase

Discharge Criteria:

- ROM 0-120 degrees
- Normal gait pattern
- No reports of knee 'buckling/giving out' during daily activities
- No reports of significant knee pain with daily activities
- Patient meets functional goals set during the initial PT evaluation

Rehabilitation:

Postoperative day 7-14

GOALS

- Passive range of motion 0 to 90 degrees
- Reduce swelling and pain
- Promote adequate quadriceps contraction
- Safe/independent ambulation and patient transfers
- Teach patient light retrograde massage

SUGGESTED EXERCISES

FLEXION STRETCHES

- PROM
- Active assisted knee flexion while sitting in chair
- Knee flexion with foot on 6-12 inch step and a forward weight shift allowing involved knee to advance forward over toes
- Heel slides in supine or long sitting-passive, active assisted, active
- Dangle leg from edge of table
- Stationary bike (no resistance) for gentle/partial revolutions.

EXTENSION STRETCHES

- Seated hamstring stretch
- Gastrocnemius stretch (seated or standing)
- Heel Prop in supine or sitting

STRENGTHENING

- Ankle pumps
- Quad sets (Neuromuscular Electric Stimulation for muscle re-education with poor quad set)
- Hip abduction in supine or long sitting, emphasize no extension lag
- Hamstring curls, light resistance
- Standing terminal knee extension
- Bilateral toe raises

BALANCE

- Standing bilateral weight shift-left/right, front/back
- Unilateral stance

Weeks 2-4

GOALS

- ROM 0-120
- Progress from walker to cane. Attempt to wean off all assistive devices
- Promote normal proprioceptive and neuromuscular control
- Control inflammation/effusion

SUGGESTED EXERCISES

FLEXION STRETCHES

Continue as before. Consider adjusting bicycle seat height as well as position of foot on pedal to assist with flexion. To minimize stress on the knee, position the heel on the pedal and/or raise the bicycle seat height. As the incision heals, you may begin patella mobilizations in all directions.

EXTENSION STRETCHES

- Continue as before.

STRENGTHENING

- Progress hamstring curl from bilateral to unilateral
- Multi hip machine-emphasize unilateral hip extension and bilateral hip abduction
- Closed Chain Exercises:
 - Leg press-concentric-unilateral (65-10 degrees), light resistance
 - Leg press-eccentric (65-10 degrees), progressive resistance
 - Mini-wall squats (0-40 degrees), feet shoulder width with slight external rotation
 - Step ups-forward, lateral left/right, downward-progress from 4-6 inches and from using bilateral upper extremity support to none
 - Unilateral stance, progress to lock/unlock knee

BALANCE

- Bilateral BAPS or KAT, progress to unilateral on involved LE
- Single leg balance, level surface-eyes open/closed. Begin with 2 hands for support, progress to no hands.
- Standing kick exercise-stand on involved leg while simultaneously swinging the uninvolved leg back and forth; use theraband for resistance.

Week 4-8

GOALS

- ROM 0-120 degrees or better
- Optimize gait pattern, D/C assistive device
- Work on functional exercises to progress patient towards independence with ADL's, recreational, or the occupational needs of each patient.
- Should be able to ambulate without any assistive devices, except for long distances

FLEXION STRETCHES

If flexion ROM is slow to progress, consider a low load prolonged stretch. This can be done while seated with the knee held in static flexion for 5-10 minutes. Moist heat may be applied to the mid quadriceps. Also consider trying either prone or supine quadriceps stretches. Dynamic or static bracing may also be considered.

EXTENSION STRETCHES

If full knee extension has not been attained, consider prone hangs and or heel props with overpressure.

STRENGTHENING

Progress closed chain exercises, increasing resistance as tolerated. Advanced strengthening exercises:

- Vertical step ups
- With the previously described step up exercises, minimize the participation of the uninvolved leg
- Resisted walking: backwards, forward, lateral left/right
- Increase step up height greater than 6 inches. Emphasize minimal assistance allowed with either upper extremity or the uninvolved leg.

BALANCE

As before, but progress all exercises from bilateral to unilateral and from a stable surface to an unstable surface. Various balance exercises with perturbation training; balance training while doing an alternate activity such as tossing a ball.