Total Knee Replacement: Rehabilitation Protocol

This rehabilitation protocol was developed for patients who have had a cemented total knee arthroplasty. Patients who have had a prior patellectomy or failed total knee replacement may require modifications in regards to the progression of weight bearing and knee motion as discussion in this protocol.

The overall goals of the operation and rehabilitation are to:

- Control joint pain, swelling, hemarthrosis (minimal or none)
- Regain normal knee flexion and extension
- Regain a normal gait pattern and neuromuscular stability for ambulation
- Regain normal quadriceps, hamstring lower extremity muscle strength
- Regain normal proprioception, balance, and coordination for desired activities
- Achieve optimal functional outcome based on orthopaedic and patient goals

The supervised rehabilitation program is supplemented with a home self-management program which the patient performs on a daily basis. The therapist must evaluate the patient thoroughly to implement the enclosed protocol and should see the patient in the clinic for therapeutic procedures and modality treatments which are required for rehabilitation. The majority of this protocol can be accomplished at home provided patient cooperation and follow through are present.

Important postoperative signs to monitor include:

- Fever, malaise, lethargy or general feeling of being unwell
- Swelling of the knee joint or soft tissues
- Abnormal pain response
- Insufficient flexion or extension
- Weakness (strength/control) of the lower extremity, especially the quads/hamstrings
- Insufficient lower extremity flexibility

Physician Notification

The physician will be notified if the patient

- fails to meet the expected goals
- has a persistent joint effusion
- develops a chronic pain syndrome
- has difficulty with ambulation
- has a limitation of knee motion
- develops other complications associated with surgery.

Discharge Criteria

- 0-90° of knee motion
- Able to full weight bear
- Pain and swelling controlled, no giving-way
- Dry wound

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Return to Activities Warning

Return to strenuous activities after total knee arthroplasty carries the definite risk of failure of the prosthesis. These risks cannot always be scientifically assessed. Patients are warned to avoid running, twisting, turning, and jumping activities and to return to only light recreational or work activities. Patients are asked to avoid any activity in which symptoms of pain, swelling, or a feeling of instability are present.

Phase 1: Week 1 & 2

Goals:

1. demonstrate safe and independent transfers from bed and various surfaces.
2. demonstrate safe and independent ambulation with appropriate assistant device.
3. negotiate steps safely with wide based quad cane (WBQC) or crutches.
4. demonstrate fair to good static and dynamic balance with appropriate assistant device.
5. attain full extension (0°) and 100° flexion of the involved knee.
6. demonstrate home exercise program (HEP) accurately.
7. thromboembolic chemical prophylaxis may be used for the first 15 days post surgery

Day 1 post-surgery:

- Urinary catheter out, antibiotic course complete and repeat blood tests performed. If a blood transfusion is not required, then the cannula is taken out and the patient is now free from all “tubes”.
- Ice for 20 minutes every 1-2 hours, a minimum of x3/day.
- A towel roll should be placed under the ankle, but never under the knee.
- Review and perform all bedside exercises which include ankle pumps, quadriceps sets,
- gluteal sets, and heel slides.
- Sit at the edge of bed with necessary assistance.
- Ambulate with standard walker 15m with moderate assistance.
- Sit in a chair for 15 minutes.
- Actively move knee 0-70°.

Day 2:

- Continue as above with emphasis on improving ROM, performing proper gait pattern
- with assistant device, decreasing pain and swelling, and promoting independence with
- functional activities.
- Perform bed exercises independently 5 times per day.
- Perform bed mobility and transfers with minimum assistance.
- Ambulate with standard walker 75-100m with contact guarding.
- Ambulate to the bathroom and review toilet transfers.
- Sit in a chair for 30 minutes twice per day, in addition to all meals.
- Actively move knee 0-80°.

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Day 3:

- Continue as above.
- Perform bed mobility and transfers with contact guarding.
- Ambulate with standard walker 150m with supervision.
- Ambulate with WBQC 150m with contact guarding.
- Negotiate 4 steps with necessary assistance.
- Begin standing hip flexion and knee flexion exercises.
- Sit in a chair for most of the day, including all meals. Limit sitting to 45 minutes in a single session.
- Use bathroom with assistance for all toileting needs.
- Actively move knee 0-90°.

Day 4

- Continue as above.
- Perform bed mobility and transfers independently.
- Ambulate with WBQC 300m with distant supervision.
- Negotiate 4-8 steps with necessary assistance.
- Perform HEP with assistance.
- Continue to sit in chair for all meals and most of the day. Be sure to stand and stretch your operated leg every 45 minutes.
- Actively move knee 0-95°.
- Discharge from the hospital to home if ambulating and negotiating stairs independently.

Day 5

- Continue as above.
- Perform bed mobility and transfers independently.
- Ambulate with WBQC 400m independently.
- Negotiate 4-8 steps with WBQC safely.
- Perform HEP independently.
- Actively move knee 0-100°.
- Discharge from the hospital to home.
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PHASE II: PROGRESSIVE FUNCTION (WEEKS 2-5)

Goals:

1. Progress from WBQC to straight cane.
2. Improve involved lower extremity strength and proprioception.
3. Improve static and dynamic balance to good-normal.
4. Maximize function in the home environment.
5. Attain 0-125° active knee motion.

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Weeks 2-3

- Monitor incision site and swelling. Visit your local doctor for a wound review.
- If any concerns contact your surgeon for review.
- Continue with HEP.
- Progress ambulation distance (increase 1/2 block to 1 block each day) with WBQC.
- Begin stationary bicycle with supervision for 5-10 minutes.
- Begin standing wall slides. DO NOT ALLOW THE KNEES TO MOVE FORWARD OF THE TOES.
- Incorporate static and dynamic balance exercises.
- AROM 0-115°.

WEEKS 3-4

- Continue as above.
- Practice with straight cane indoors.
- Increase stationary bicycle endurance to 10-12 minutes, twice per day.
- Attempt unilateral stance on the involved leg and side stepping.
- Incorporate gentle semi-squats (BODY WEIGHT ONLY) concentrating on eccentric control of the quadriceps.
- Attain AROM 0-120°.

WEEKS 4-5

- Continue as above.
- Ambulate with straight cane only.
- Increase stationary bicycle to 15 minutes, twice per day.
- Progress with gentle lateral exercises, i.e. lateral stepping, carioca.
- Attain AROM 0-125°.

PHASE III: ADVANCED FUNCTION (WEEKS 6-8)

Goals:

1. Progress to ambulating without an assistive device.
2. Improve static and dynamic balance to normal without assistive device.
3. Attain full AROM (0-135°).
4. Master functional tasks within the home environment.

WEEKS 6-7

- Visit your surgeon for review with a new xray
- Continue as above.
- Ambulate indoors WITHOUT device.
- Focus exercises on strength and eccentric control of muscles. DO NOT USE CUFF WEIGHTS UNTIL CLEARANCE FROM SURGEON.
- Focus on unilateral balance activities.
- Continue aggressive AROM exercise to promote knee range of motion 0-135°

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WEEKS 7-8

- Continue as above.
- Develop and instruct patient on advance exercise program for continued strength and endurance training.
- Ambulate without straight cane.

3, 6 & 12 Month surgeon review with repeat xrays and reassessment.

This protocol is intended as a basic overall guide to various stages of rehabilitation after knee replacement surgery. Patients' needs may very depending on their clinical situation and some may be able to achieve some milestones quicker or slower than others, whereas some patients may not achieve all these milestones because of other clinical or patient related factors. Other types of knee replacemnet surgery such as unicompartmental replacements or revision knee replacements may have a different rehabilitation protocol and some of the above steps may not apply to the patient. Please contact Care First Orthopaedic centre if there are any queries about a patient's rehabilitation protocol

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