



# TEC ORTHOPEDICS

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## Comprehensive Prehabilitation Program for Total Knee Replacement

### Objective:

Prepare the patient for total knee replacement by improving joint strength, flexibility, range of motion (ROM), and functional mobility. This program includes ROM exercises to optimize knee function before surgery and familiarizes the patient with post-operative exercises and assistive devices (e.g., a walking knee frame and crutches).

### Program Goals

1. **Strengthen muscles** supporting the knee to aid in recovery.
2. **Increase knee flexibility** and range of motion for better surgical outcomes.
3. **Improve functional mobility** using assistive devices.
4. **Prepare the patient mentally and physically** for postoperative recovery.
5. **Minimize post-surgical complications** by addressing pre-surgery conditioning.

### Program Structure

**Duration:** At least 2 weeks

**Frequency:** 2-3x per week

**Duration per session:** 45–60 minutes

### Training with Assistive Devices (15 minutes)

Focus: Proper use of assistive devices for mobility and support.

#### 1. Walking Knee Frame Training

- **How-to:** Adjust the frame to the correct height. Practice proper gait mechanics:
  - Move the frame forward.
  - Step forward with the surgical leg, followed by the unaffected leg.
- **Goal:** Safely walk for 10–15 minutes indoors without fatigue or instability.

## 2. Crutch Walking Training

- **How-to:** Use a **partial weight-bearing gait:**
  - Move both crutches forward.
  - Step with the surgical leg, then the unaffected leg.
- Practice navigating turns, uneven surfaces, and stairs (if applicable).

### Warm-Up (5–10 minutes)

Purpose: Warm up muscles and improve joint mobility.

- **Stationary cycling** or walking using the knee frame for 5–10 minutes.
- Dynamic stretches, such as:
  - **Leg swings:** Gently swing each leg forward and backward.
  - **Hip circles:** Rotate each leg in small circular motions.

### Strengthening Exercises (15–20 minutes)

Focus: Build strength in the quadriceps, hamstrings, calves, and hips.

#### 1. Quad Sets

- **Purpose:** Strengthen quadriceps to support knee stability.
- **How-to:** Sit with legs extended. Tighten the quadriceps and press the back of the knee into the floor. Hold for 5–10 seconds.
- **Reps:** 10, repeat 3 times.

#### 2. Straight Leg Raises

- **Purpose:** Strengthen the quadriceps and hip flexors.
- **How-to:** Lie on your back. Keep the surgical leg straight and lift it to about 12 inches, then lower.
- **Reps:** 10, repeat 3 times.

#### 3. Hamstring Curls

- **Purpose:** Strengthen hamstrings for better knee function.
- **How-to:** Stand while holding onto the knee frame for support. Bend the surgical leg to bring the heel toward the buttocks, then slowly lower.
- **Reps:** 10, repeat 3 times.

#### 4. Mini Squats (with Knee Frame or Crutches)

- **Purpose:** Strengthen the quadriceps, glutes, and hamstrings.
- **How-to:** Stand holding the frame or crutches. Perform shallow squats, avoiding excessive knee bending.
- **Reps:** 10, repeat 3 times.

## 5. Calf Raises

- **Purpose:** Strengthen calves and improve balance.
- **How-to:** Stand holding the frame or crutches. Raise both heels off the ground, then slowly lower.
- **Reps:** 10, repeat 3 times.

## Range of Motion (ROM) Exercises (10 minutes)

Focus: Enhance knee flexibility and ROM, crucial for post-operative recovery.

### 1. Heel Slides

- **Purpose:** Improve knee flexion.
- **How-to:** Lie on your back or sit with legs extended. Slowly slide the heel of the surgical leg toward the buttocks, then return to the starting position.
- **Reps:** 10, repeat 3 times.

### 2. Knee Extension Stretch

- **Purpose:** Improve knee extension and reduce stiffness.
- **How-to:** Sit on a chair or flat surface. Extend the surgical leg straight out, hold for 5–10 seconds, and return to the starting position.
- **Reps:** 10, repeat 3 times.

### 3. Seated Knee Flexion Stretch

- **Purpose:** Enhance knee flexibility.
- **How-to:** Sit on a chair. Slide the surgical leg backward under the chair as far as possible and hold for 5 seconds.
- **Reps:** 10, repeat 3 times.

### 4. Passive Knee Extension (Using a Towel)

- **Purpose:** Stretch the knee into full extension.
- **How-to:** Sit on a flat surface with a rolled towel under the ankle of the surgical leg. Let the leg relax and straighten fully.
- **Hold:** 20–30 seconds, repeat 2 times.

### 5. Ankle Pumps

- **Purpose:** Improve circulation and prevent stiffness in the lower leg.
- **How-to:** Flex and point the toes up and down while lying or sitting.
- **Reps:** 15–20, repeat 3 times.

## Cardiovascular Conditioning (5–10 minutes)

Purpose: Improve endurance and prepare for functional mobility.

- Brisk walking using the knee frame or crutches.

## Cool Down (5 minutes)

Purpose: Relax muscles and reduce heart rate.

- Perform gentle stretches for the quads, hamstrings, and calves (e.g., standing quad stretch while holding the frame).

## Milestones

### 1. Week 1:

- Patient demonstrates improved knee ROM (target: at least 90° of flexion).
- Confident use of assistive devices for walking indoors.
- Completes strengthening and flexibility exercises with minimal discomfort.

### 2. Week 2:

- Increased ROM (target: 100–120° of flexion).
- Ambulates confidently with assistive devices for longer distances.
- Stronger quadriceps and hamstrings, reducing stress on the joint.

## Purpose of Continuing ROM Exercises Post-Op

- **Heel Slides, Knee Flexion, and Extension Stretches:** Regain full ROM for daily activities.
- **Quad Sets and Ankle Pumps:** Minimize swelling, improve circulation, and prevent muscle atrophy.
- **Seated Knee Flexion Stretch:** Accelerate recovery by gradually improving flexibility.

By incorporating ROM exercises with strengthening and assistive device training, this prehabilitation program ensures better surgical outcomes, faster recovery, and improved post-op mobility.

Sincerely,



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Orthopedic Surgery  
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