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## Rehabilitation Program Following Anterior Cruciate Ligament Reconstruction

### Introduction:

The anterior cruciate ligament is one of the main stabilizing ligaments of the knee. Loss of this ligament can lead to functional instability during work or sports and can also lead to the development of knee arthrosis.

The goals of anterior cruciate ligament reconstruction are to provide functional stability to the knee, return the patient to his/her previous level of activity, and prevent the development of arthrosis. Modern methods of arthroscopic reconstruction of the anterior cruciate ligament can successfully return functional stability to the knee. The most worrisome complication following this surgery is the development of arthrofibrosis with its adherent loss of motion and weakness in the operative extremity.

The goal of the anterior cruciate ligament post reconstruction rehabilitation is to return normal motion, strength, and function to the knee while not compromising the integrity of the reconstructed anterior cruciate ligament. Total body conditioning should be utilized throughout this protocol.

The following rehabilitation program is offered to provide consistent, efficient and goal-directed rehabilitation. The program is divided into five phases. Each phase has a **time frame** provided for the purpose of guidance and protection. However, it is understood that all patients will vary somewhat in their speed of recovery. Each phase has **goals**, which provide the rationale behind the treatment approach. The **treatment recommendations** are the therapeutic modalities, which can be used to safely achieve the goals for each phase. **Notes** provide parameters for the use of braces, crutches, etc. **Precautions** are offered to make the treating therapist and patient aware of special problems that may arise during specific phases during the rehabilitation program.

If any questions arise during the course of this anterior cruciate ligament rehabilitation program, do not hesitate to contact your surgeon or therapist.

## Phase 1 – Early Mobilization Phase

### Time Frame: 0 To 2 Weeks

#### Goals:

1. Decrease pain and swelling
2. Full extension, and
3. Voluntary quad contraction

#### Treatment recommendations:

1. Ice
2. Active range-of-motion, passive range-of-motion, CPM
3. Prone lying with legs off edge of bed achieving full extension
4. Quad sets
5. Patellar mobilizations, especially superiorly
6. Straight leg raises
7. Full arc quad without weights
8. Multidirectional hip PREs
9. Prone knee flexion
10. Calf and hamstring stretching

#### Note:

Ambulation weightbearing as tolerated is begun on post-op day #1. Crutch use is around 2 weeks.

## Phase II – Late Mobilization Phase

### Time Frame: 2 to 6 Weeks

#### Goals:

1. Good quad control
2. Normal gait, and
3. Full flexion

#### Treatment recommendations:

1. Continue all exercises begun in Phase I, add weights as tolerated
2. Mini-squats
3. Wall Slide mini-squats
4. Short arc quads, 60° to 90°, with weights as tolerated
5. Toe raises with weights as tolerated
6. Step-ups, 2 inches and progress to full step

#### Note:

Crutches can be discontinued when the patient demonstrates a normal gait.

**Precaution:**

Motion should be full by 6 weeks. A 10° or greater deficit of extension and/or less than 125° of flexion is considered serious losses of motion. The physician should be contacted sooner, rather than later, if full motion appears unachievable. A change in therapy or surgery may be indicated.

## Phase III – Early Strengthening Phase

**Time Frame: 6 Weeks to 3 Months****Goals:**

1. Strength 60% of opposite limb
2. Re-emphasize full range-of-motion & normal gait

**Treatment Recommendations:**

1. Continue with exercises from previous two phases
2. Begin more closed-chain activities, e.g., step-ups, mini-squats, Stairmaster, bike riding, PNF, etc.
3. Continue gait training, both fast speed and slow speed, for good control and strengthening of muscles
4. Proprioceptive training, early phase Plyometrics performed only with supervision
5. May begin supervised jogging

## Phase IV – Late Strengthening Phase

**Time Frame: 3 to 5 Months****Goals:**

1. Strength 80% of opposite limb

**Treatment recommendations:**

1. Continue with exercises from previous phases increasing resistance as tolerated
2. Increase intensity of Plyometrics
3. Increase jogging/running intensity
4. Jump rope

## Phase V – Functional Phase

### Time Frame: 5 to 9 Months

#### Goals:

1. Return to full activity, work or sport

#### Treatment recommendations:

1. Progressive Plyometrics
2. Incline Plyometrics
3. Jogging
4. Running
5. Bounding
6. Skipping
7. Hopping
8. Sport simulation

#### Criteria for returning to sport activities

1. One-leg hop test 90% of opposite leg
2. Jog without a limp
3. Full-speed run without a limp
4. Shuttle run without a limp
5. Figure 8 running without a limp
6. Single leg vertical jump 90% of opposite limb
7. Squat and rise from squat

#### Criteria for returning to work activities

1. Perform simulated work activity to 90% level