

REHABILITATION OF KNEE INJURIES

Exercises should be performed with consideration for the presence or absence of pain. If pain is persistent the exercises may not be appropriate for the injury or the patient. Make sure exercises are performed properly with good technique

INITIAL PHASE

WARM-UP

Whirlpool, hot bath, hot tub or hot packs. 5 min.

Isometric knee exercises - contract muscles in all four quadrants for three sets of 5 seconds each. Forward (Quads), backward (Hamstring), inside (Adductors), outside (Abductors).

Range of motion - move knee in flexion (backward) when prone, perform extension (forward) when knee is hanging over table while seated.

Hip Exercises

1. Hip flexion - seated at edge of table or bed with knee flexed (hanging). The hip is actively flexed without resistance for three sets of 10 reps.
2. Hip abduction - lying on the non-injured side with the non-injured knee and hip flexed. The injured knee and hip are fully extended and the injured leg is abducted (side away) until it is well above the table or mat. leg should be held at the top for two seconds and then relaxed for 5 seconds. 3 sets of 10 reps.
3. Hip extension - lying face down, with the injured leg over the edge of a table or bed. The leg is raised keeping the knee extended (straight), until even with the edge of the table. Hold for two seconds, relax for five seconds. 3 sets of 10 reps
4. Hip adduction - isometric contractions of the adductors against a rolled towel between knees or practitioners resistance.

KNEE EXERCISES - INITIAL

1. Isometric (do not move joint, just contract muscle) leg extensions (forward) - Performed in the seated position and performed with 2 seconds contraction with 4 seconds of relaxation. Do not fully extend the knee in these exercises. 3 sets of 10 reps
2. Isometric leg curls (backward) - Performed face down, curling the leg up. Do not fully extend the knee (straight) while performing these exercises. Do perform several different joint angles during this exercise.

Resistive Exercises

Using resistive Theraband, tubing, weights, etc..

1. **Leg extensions** - performed in the seated position much like the Isometric but with resistance. Emphasis is put on contracting the Vastus Medialis at the top of the arc. 3 sets of 10 reps.
2. **Leg curls** - These are performed prone on most machines. Care should be taken to avoid full knee extension under weight as this could compromise the injured knee joint.
3. **Lunges** - These are performed with dumbbell weights held in both hands. Care is taken with performance of this exercise. Knee is straight over the ankle. DO NOT go past perpendicular knee over ankle as this puts undo stress on the knee.
4. **Agility exercises** - Designed to recover normal function of movement. Allow the nervous system/proprioceptive system to readjust to complex movements. These can be any complex exercise involving the lower extremities. Dance, ballet, pool walking,
5. **Stretching** - Knee rehabilitation usually involves the Gastroc-soleus group, the hamstring group, the adductors and gluteals. Stretching the quadriceps is generally contraindicated at least in the early stages because extreme flexion may cause pain and insult to the injured knee. The stretching is usually performed initially by the practitioner and then taught to the patient for performing it on their own. Stretching is not to be taken to the extreme ranges. Stretching must be performed with the intention of inhibiting the stretch reflex pathway and lengthening the connective tissues involved.

BEGINNING INTERMEDIATE PHASE

WARM-UP - Whirlpool, hot pack. 5 min.

RESISTIVE EXERCISE

<u>Exercises</u>	<u>Repetitions</u>	<u>Sets</u>	<u>Weights / Resistance</u>
Hip abduction	10	2-3	
Hip extension	10	2-3	
Hip Adduction	10	2-3	
Quadriceps isometric contract	10	2	
45 degree quad extension	10	2	
Hamstring isometric contract	10	2-3	
Toe Raises	20	2-3	
<u>Stretching</u>			
Calf	10	3	Body Weight
Hamstring	10	3	5 lbs.
Adductors (gently)	10	3	5 lbs.

Isometric muscle contraction in all ranges of motion, Pool walking, Gentle Range of Motion.

INTERMEDIATE PHASE PROGRAM

WARM-UP

Bike

Stretching

Calf w/ tilt/wobble board

Hamstring (pt. supine), passive stretch, practitioner can use Theraband around the patients heel to apply the stretch and have the patient actively resist by extending the thigh to relieve the stretch. Hold on tight.

Other area if indicated (adductors, abductors, glutes, quads)

<u>Exercise</u>	<u>Repetitions</u>	<u>Sets</u>	<u>Weight /</u>
<u>Resistance</u>			
Hip Adduction	10	3	
Hip Abduction	10	3	
Hip Flexion	10	3	
Hamstring Curls	10	3	
45 degree quad extension	10	3	

Step ups or Stairmaster, Treadmill to patient tolerance, not to exceed 15 min.

Swimming

Bicycling to patient tolerance

ADVANCED PHASE

Bike, to tolerance

Jog-walk

Stairmaster

<u>Exercises</u>	<u>Repetitions</u>	<u>Sets</u>	<u>Weight /</u>
<u>Resistance</u>			

Same as intermediate but add:

Lunges	20	3	
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Agility drills - complex movements, basketball, racquetball, dance, ballet, walking.