

Exercise Therapy

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Free exercise for knee joint

1. Quadriceps Setting (Quad Sets)

Patient position: Supine, sitting in a chair (with the heel on the floor) or long-sitting with the knee extended (or flexed a few degrees) but not hyperextended.

Procedure: Have the patient contract the quadriceps isometrically, causing the patella to glide proximally; then hold for a count of 10 and repeat. Use verbal cues and When the patient sets the muscle properly, offer verbal reinforcement immediately and repeat the activity. Have the patient dorsiflex the ankle and then hold an isometric contraction of the quadriceps.

2. Straight-Leg Raise (SLR)

Patient position: Supine, with the knee extended. To stabilize the pelvis and low back, the opposite hip and knee are flexed, and the foot is placed flat on the exercise table.

Procedure: First, instruct the patient to set the quadriceps muscle; then lift the leg to about 45 degree of hip flexion while keeping the knee extended; hold the leg in that position for a count of 10 and then lower it.

As the patient progresses, have the patient lift to only 30 degree of hip flexion and hold the position. Later, have the patient flex the hip to only 15 degrees. The most significant resistance to the quadriceps is during the first few degrees of SLR.

To increase resistance, place a cuff weight around the patient's ankle.

3. Multiple-Angle Isometric Exercises

In Supine position: Supine.

Procedure: Have the patient perform bent leg raises with the knee in multiple angles of flexion.

In Sitting position: Seated at the edge of a treatment table.

Procedure: When tolerated, resistance is applied at the ankle manually or mechanically to strengthen the quadriceps isometrically in varying degrees of knee flexion.

4. Short-Arc Terminal Extension

Patient position: Supine or long-sitting.

Procedure: Place a rolled towel or bolster under the knee to support it in flexion. The patient can also assume a short-sitting position at the edge of a table with the seat of a chair or a stool placed under the heel to stop knee flexion at the desired angle. Begin with the knee in a few degrees of flexion. Increase the degrees of flexion as tolerated by the patient or dictated by the condition. Initially have the patient extend the knee only against the resistance of gravity.

5. Full-Arc Extension

Patient position: Sitting or supine.

Procedure: Have the patient extend the knee from 90 degree to full extension. Apply resistance to the motion as tolerated.

Reference: Kisner, Carolyn Therapeutic exercise: foundations and techniques / Carolyn Kisner, Lynn Allen Colby. — 5th ed.

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