The Essential Knee

Case study

A 71 year old female presents to you with the diagnosis of left knee osteoarthritis. She has had a gradual increase pain at night, going up steps, and limitations in walking. The pain has worsened over the past 6 months, and has begun to limit the patient’s ability to play tennis. She also wakes 2-3 times a night with pain, and she must use a rail to ascend the steps. Recently, her knee has started to give way a bit as she uses the stairs. She does experience great stiffness in her knee after sitting.

Initial evaluation findings are as follows:
Medical Diagnoses and Medications
Diabetes Type 2 - Glucophage
High Cholesterol – Zocor
Acid Reflux – Pepcid

Clinical Findings:
Pain: 7/10 at worst
Height: 5 feet 5 inches, weight 150 pounds
Alignment: valgus at knees in standing
Strength: dynamometer testing
  Quads - Right: 42 lbs Left: 35 lbs
  Hamstring – Right 25 lbs  Left 22 lbs
  Hip abduction – Right 28 lbs Left 24 lbs

Swelling left girth is 1.1 cm greater than the right

AROM – knee lacking 8 degrees in extension, flexion to 90 degrees

Decreased patella mobility, inferior, and superior

Palpation – infrapatella tenderness; positive patella compression test

Dorsiflexion – right to 5 degrees and left to 5 degrees; hamstring length to 60 degrees with straight leg test; + Thomas test – lacking 5 degrees bilaterally

Balance – one leg stance left is 2 seconds; right is 8 seconds

Functional Tests – positive wobble test; pain with stepping up on a six inch step

Lower Extremity Functional Scale –

Please take the information from above and write your treatment goals for your patient.

Then take the above information and develop a treatment plan for your patient. List what you would do for the first three treatment sessions.
The goals we set for Mr. M

Goals

1) Pain to decrease to a 3/10 at worst, through walking, ADL’s, and sleeping.
2) Decrease swelling, with girth measures equal bilaterally to decrease inhibition to quad.
3) Increase knee AROM to 0 degrees of extension and 120 degrees of flexion to improve gait quality and allow patient to squat to ground.
4) Increase knee extension strength to 48 pounds, flexion to 31 pounds, and abduction to 38?? Pounds to reach age norms.
5) Increase one leg stance time to 5 seconds to reduce fall risk.
6) Increase dorsiflexion AROM to 8 degrees to restore normal gait and reduce fall risk.
7) Increase hip extension to 5 degrees in the Thomas test.
8) LEFS score to increase to……
9) Negative tenderness with palpation.

The treatment plan we developed for Mr. M – first 3 sessions

Treatment Session One
Initiate treatment by reducing swelling, in order to allow for effective quad strengthening.

1) Start with submax exercise 4 minutes of quad sets (McNair, APMR 1996)
3) Assess 1 rep max into knee extension, knee flexion, and hip abduction to set up strengthening program for follow-up sessions
4) Initiate balance training with one leg stance exercise
5) Start stretches at 30 second holds, 3 times of each, bilaterally – gastroc, soleus, hamstring, and hip extension
6) Start home exercises – quad sets 5 seconds 20 times, and mid-range quad holds (short arc quads) 5 seconds 20 times (O’Reilly Ann Rheum Dis, 1999). This will assist both with decreasing swelling and increasing quad function.
7) End session with cryotherapy if swollen for 15 minutes (Uchio AMPR 2003)

Treatment Session Two

1) Include steps 1 and 2 from session one
2) Add manual therapy to the hip – 2 minutes each of P-A, A-P and caudal glides (Cleiborne, JOSPT 2004)
3) Initiate strengthening program based on the 1 RM finding from session one including hip abduction, knee extension, and knee flexion. Cuff weights or machines are appropriate. Program will be set at 60% of 1 RM and be done 2 times a week
4) Continue balance and stretches from session one (steps 4 and 5)
5) Add stationary biking in at 40% max heart rate to start. Start at 10-15 minutes at tolerated, and build to 25 minutes, 3 times a week as reported by Mangione in J of Gero, 1999
6) End with cryotherapy as above

**Treatment Session Three**

1) If swelling is down at this point, initiate treatment with stationary bike.
2) Repeat manual therapy to the hip and knee as above. Continue strengthening, stretching, and balance as previously stated.
3) Add functional exercises, such as step-ups and mini-squats. Care needs to be taken to promote knee alignment with these exercises.
4) Increase home exercises to include prone knee bends and stop-ups, as described by O’Reilly.
5) As swelling decreases discharge use of ice after treatment. Continue if needed for session three.