PNF for Patellofemoral Pain Syndrome (PFPS)

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Knee Anatomy

- Knee joint consists of:
  - LCL, MCL, ACL, PCL
  - Meniscus
  - Patellar tendon
  - Patella
Patellofemoral Pain

• Most common diagnosis with patients who have knee pain (esp. for runners and in sports medicine).
• Anterior knee pain or “runners knee” which contains the retinaculum and patella.
• Chondromalacia is secondary to this syndrome.
• Patient will complain of:
  – Aching knee joint, particularly on or around patella
  – Clicking/cracking
  – Pain while ascending or descending stairs or hills
Risk Factors

- Trauma/Previous Injury or Surgery
- Mal-alignment
- Hypermobility of patella
- Muscle weakness
- Poor flexibility
- Overuse
- Abnormal tracking of patella
- Tight hamstrings, IT band, retinaculum, etc.
PFPS Treatments

• RICE
• VMO strengthening
• Stretching
• Release the tight lateral structures.
• Strengthening the hips, quads, hams, other supporting muscles to help support the “Q” angle.
• Bracing
Proprioceptive Neuromuscular Facilitation (PNF)

• PNF is defined as functionally based diagonal pattern movements with neuromuscular control and functional techniques.

• Used to exercise and rehabilitate by using ADL patterns.
  – This is because we utilize multiple muscles at the same time while performing ADLs

• 10 different components in PNF
PNF (Cont’d)

• Utilized to:
  – Increase stability and strength
  – Increase coordination
  – Increase mobility

• Extremity Patterns:
  – Diagonal 1 & Diagonal 2
    • Flexion or Extension
    • [http://www.youtube.com/watch?v=wvcze7faHhc](http://www.youtube.com/watch?v=wvcze7faHhc)
PNF Techniques for PFPS

• “The goal of PNF techniques is to promote functional movement through facilitation, inhibition, strengthening, or relaxation of muscle groups (Adler et al., 2000)” (Martin & Kessler, pg 253).

• Strengthening Techniques
  – Rhythmic Initiation
  – Rhythmic Stabilization
  – Repeated Contraction
  – Slow Reversal
  – Slow Reversal Hold
PNF Techniques for PFPS

• Rhythmic Initiation:
  – Passive motion $\rightarrow$ active assistive motion $\rightarrow$ active motion

• Rhythmic Stabilization:
  – Isometric contraction of agonist $\rightarrow$ Isometric contraction of antagonist

• Repeated Contraction
  – Isotonic contraction against a max. resistance in concentric and eccentric motions
    – [youtube link](http://www.youtube.com/watch?v=vTDM2j5Mx0s)
PNF Techniques for PFPS cont’d

• Slow Reversal
  – Isotonic contraction of agonist → Isotonic contraction of antagonist
  – http://www.youtube.com/watch?v=gWAAN-wFfro

• Slow Reversal-Hold
  – Isotonic contraction of agonist → isometric contraction
Benefits

• PNF facilitates multiple muscles in the body, which leads to strengthening the lower extremities.
  – The muscles in the leg will then begin to align everything in the proper place, esp. the patella.
• Also stretches muscles and tendons that may be too tight.
• PNF helps with PFPS by utilizing every issue needing to be treated. (ie. Tight IT band, hamstrings, or weak VMO)
References