PHYSICAL THERAPY
and the
PATELLOFEMORAL JOINT

TIFFANY VANN PT DPT

OBJECTIVES:
1. UNDERSTAND WHAT A PHYSICAL THERAPY EVALUATION FOR PATELLOFEMORAL NON-SURGICAL AND SURGICAL PATIENT CONSISTS OF
2. PROTOCOLS FOLLOWED FOR BOTH NON-SURGICAL AND SURGICAL PATELLOFEMORAL PATIENTS
3. COMMON EXERCISES FOR PATELLOFEMORAL PATIENTS
4. MODIFICATIONS/TAPING AND BRACING FOR PATELLOFEMORAL PATIENTS

About Me
• Graduated with my DPT from St. Ambrose University in Davenport, Iowa in Dec of 2005
• Worked in all areas of PT practice in Iowa and Nebraska
• Started at BMP Nine Mile Dec 2014
• Focus on Workers’ Compensation and Orthopedics

Demographics
• Female > Male
• 50-59 age group > 10-19 age group
• Athletes ages 16-25
• Prevalence
  ➢ 21-40% in active adolescents
  ➢ 15-33% in adults
• Adolescents and Young Adults
  ➢ Higher in Athletes
  ➢ A quarter of all knee problems in athletes
• Soccer, Volleyball, Running female athletes
• Cyclists, Young Athletes of both genders
• Not influenced by height, weight, body fat %, military vs civilian or leg length discrepancy
• Low Performance on Vertical Jump was associated with development of PFPS

Demographic and Epidemiological Trends in Patellofemoral Pain
Glaviano, et al.
• Problems with PFP research is it is not looked at across the general population. Research is mainly done in sports medicine centers, military facilities and smaller orthopedic facilities
• Looked at Data from 2007-2011 using Pearl Diver Patient Record Database
• Looked at Patellofemoral Pain using
  ➢ Chondromalacia of patella
  ➢ Pain in joint, lower leg
• Found that Patellofemoral Pain is more common:
  ➢ In the South (42%)%)
  ➢ In Females (60%)
  ➢ Increased with age and Peaked at 50-59 years old (over 25%)
  ➢ Only 13.5% in 10-19 year olds compared to 70% of age 16-25 found in other research
• Incidence rate was approximately 7.3% of all orthopedic visits
• No real PFP code with ICD-10

Common activities that cause pain
Running
Ascending/Descending stairs
Squatting
Prolonged sitting with knee in flexed position

http://www.patellofemoral.org/pfoe/pfpain.html
PATIELLOFEMORAL PHYSICAL THERAPY EVALUATION

PT Evaluation

Gait pattern – Possibly a Trendelenburg pattern or just antalgic
VMO atrophy/ control
Effusion
Patellar mobility – limited or painful
Point tenderness – not always found
Flexibility – Typically tight in IT Band, hamstrings and quad
Knee and Hip strength
ROM

Special tests
• Ober Test – Tight IT Band commonly found
• Patellar Grind Test – may be positive
• Patellar Apprehension Test positive if previous dislocation/subluxation
• Medial and Lateral Patellar Glide Tests - often limited medially due to tight lateral structures
• Patellar Ti – sometimes present

Function Tests
• Squat ability
• Stair climbing

Subjektively patient will complain of pain with running, jumping, stairs climbing and squatting

PATIELLOFEMORAL PHYSICAL THERAPY PROTOCOLS

PATELLAR PROTECTION PROGRAM

This four-phased program approach can be utilized for both conservative and surgical patellofemoral clients.

Ultimate Goal of Program:
1. Improve Functional Status
2. Normalize biomechanical Forces
3. Improve Strength/Power/Endurance
4. Decrease Pain/Inflammatory Status

Acute Phase - Maximum Protection

Weight bearing as tolerated - crutches as needed
Ice, Compression, Elevation, Anti-inflammatory as indicated by physician
Electric Stimulation to Quadriceps

Strengthening Exercises (isometric)
• Quadriceps setting
• Multi-angle isometrics (non-painful): 90°, 75°, 60°, 45°, 30°
• Straight leg raises (four planes of motion)
• Hip abduction, hip flexion stressed
• Hip abduction not done with lateral compression syndrome

LE Stretching (especially gastroc and hamstrings, checking iliobibial band and quadriceps)

Avoid squatting, kneeling, excessive knee flexion, stairs, repetitive activities

Brace as needed for patellar stability

Knee and Hip exercises (KHE) group
• Same protocol as the KE group with the addition of
  • Hip abduction with weights (sidelying), 3 sets of 10 repetitions‡
  • Hip lateral rotation against elastic band (sitting), 3 sets of 10 repetitions‡
  • Hip extension (machine), 3 sets of 10 repetitions*

Knee exercise (KE) group
• Stretching (hamstrings, plantar flexors, quadriceps, and iliobibial band), 3 repetitions of 30 seconds
• Seated knee extension from 90° to 45°, 3 sets of 10 repetitions*
• Leg press from 0° to 45°, 3 sets of 10 repetitions*
• Single-leg calf raises, 3 sets of 10 repetitions*
• Prone knee flexion,† 3 sets of 10 repetitions*


Knee exercise (KE) group
• Stretching (hamstrings, plantar flexors, quadriceps, and iliobibial band), 3 repetitions of 30 seconds
• Seated knee extension from 90° to 45°, 3 sets of 10 repetitions*
• Leg press from 0° to 45°, 3 sets of 10 repetitions*
• Single-leg calf raises, 3 sets of 10 repetitions*
• Prone knee flexion,† 3 sets of 10 repetitions*

Knee and Hip exercises (KHE) group
• Same protocol as the KE group with the addition of
  • Hip abduction with weights (sidelying), 3 sets of 10 repetitions‡
  • Hip lateral rotation against elastic band (sitting), 3 sets of 10 repetitions‡
  • Hip extension (machine), 3 sets of 10 repetitions∗
• Result showed that the KHE group has better pain control and functional outcomes compared to the KE group at the 3, 6 and 12 month follow ups
• Most significant difference was found in the single-leg hop test of the KHE group at 12 months compared to that of the KE group

Subluxations & Dislocations
• Mainly seen in children or traumatically in adults/athletes
• Research is undecided on bracing/splinting vs allowing unrestricted movement
• Physical Therapy unless MPFL reconstruction is needed

MPFL Reconstruction
• 0-3 wk postop
  - Motion, advance as tolerated PT in brace
  - Quad sets, 4-way hip exercises, calf raises
  - Eccentric exercises in position of quad control
• 3-5 wk postop
  - Motion with cooperation or no brace, for support
  - Quad sets, 4-way hip, and calf raises
  - Physical Therapy/PT with use of band or minimal resistance
  - Gradually start running with no progression
  - Gradually start running with no progression
• 6-12 wk postop
  - Motion with closed chain double leg strengthening
  - Start running in brace
• 12+ wk postop
  - Return to sports

Lateral Release
• Failed conservative treatment
• Need to watch out for medial stability issues as a lateral release will make this worse.
• Decreased patellar elevation during patellar tilt testing
• Decreased lateral translation during patellar glide testing

General Rehab Considerations
• Encouraged patients to switch from running to swimming, pool running or cycling
• Avoidance of squats, stairs and uphill running
• An elliptical should be used with caution as it may cause increase patellofemoral contact forces
• Address poor patellofemoral tracking
• Increase patellar mobility and LE flexibility
• Strengthen VMO and Posterolateral hip joint musculature
• Eccentric exercises more than concentric exercises and closed chain more than open chain

Effectiveness of Exercise Therapy in Treatment of Patients with Patellofemoral Pain Syndrome: A Systematic Review and Meta-Analysis
Ron Clijsen, Janine Fuchs, Jan Taeymans in Physical Therapy July 2014
• Used PEDro and ended up with 15 studies out of 285 that were included in the Meta-Analysis
  - Exercise Therapy vs No-Exercise Therapy
  - Exercise vs Exercise with Additive Therapy
  - Knee Extension Exercises vs Other Forms of Exercise
• Exercise prescription varied widely across the trials
  - 3 to 5 times a week vs 2 or less a week vs home-based exercise only
• Exercise showed improvements in surveys (PRIMALP) but not in VAS pain scale in both the short and long-term.
• Exercise vs Exercises with Additive Therapy (Electrical Stim or splinting) showed that exercise was more favorable in the long-term than adding additional therapy
• Closed-Chain vs Open-Chain exercises showed no significant difference between the groups
• Overall, determined that exercise was important in achieving pain relief with PFPS but the type of exercise can not be determined at this time
  - Closed-chain exercises did show a slight advantage over open-chain exercises, just not a statistically significant one.
Important Exercises to Complete for Patellofemoral Problems

- Side-lying hip abduction
- Prone hip extension
- Side-lying clamshells with theraband
- Prone hip extension with knee flexion

Close Chain Exercise

- Lateral Step Downs
- Forward Step Downs
- Squats

Core Stability

- Forward Planks
- Side Planks
- Bridges
- Single-leg Bridges

Graston

- Use of Graston or other manual therapy treatment to the IT Band and around patella can help decrease tightness that is inhibiting correct patellar alignment

McConell Taping

- Taping begins with an assessment of the patellofemoral joint's lateral hypermobility.
- Hypafix (Cover Roll) is applied to the skin covering the knee to protect the skin from the tape.
- Next, a medial glide of the patella is obtained by manually pushing the patella medially to its end range of motion.
- Rigid strapping tape is then used to maintain the medial glide of the patella by pulling the skin and patella medially.

Kinesio-taping

http://lrmagazine.com/article/patellofemoral-taping-pain-relief-mechanisms
A variety of different braces can be found at Target, Wal-Mart, CVS, Walgreens or even Academy. The best over the counter brace is going to have straps to help adjust the brace for comfort, and a pad around the patella to provide extra support/stability.

In Conclusion...

- Research shows that hip and core strengthening is more beneficial than knee strengthening alone in the treatment of patellofemoral problems
- Physical therapy is usually the first step and only after 6-8 weeks of treatment should surgery be considered

Patellofemoral Education from the International Patellofemoral Study Group


Special Thanks to Brent Thompson

Any Questions?