

**Patellofemoral Treatment Today**  
**Track 1 #103**

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**Learning Objectives:**

**Upon completion the attendee will have been:**

- 1. presented the treatment rationale for PFPS today
- 2. presented the concept of patient classification/categorization
- 3. presented the treatment programs linked to PFPS classification

**Patellofemoral**  
**Conservative Concepts**  
**“New Approaches”**  
**for an**  
**Old Problem**

**Common Descriptions**

- Black hole of orthopaedics
- A treatment enigma
- Great challenge for management
- Underdiagnosed and over operated
- Soft tissue dominated joint
- Anterior knee pain

**Initial question: What Hurts?**

**Dr. Scott Dye**

**Conscious Neurosensory Map of the Knee AJSM 1998**

**0 – Rating of Articular Cartilage**

**to**

**4 A – Anterior Synovium, Fat Pad, Joint Capsule**

**Meniscal Tissue Variable**

**( Greater sensation peripherally )**

**Dr. Scott Dye - 1999**

**“ The Knee does not recognize**  
**the difference between an**  
**Ax attack and major surgery !!!”**

**What we must appreciate  
As Physical Therapists:  
We want to fix things  
&  
make them better  
(It is in our genetic makeup)**

**You can only do so much**

**The Good News  
When we match  
Problem (Classification) and Protocol  
(Clinical Prediction Rule in Reality)  
80+ % success is common  
in most groups**

**How we (I) got here  
First experiences in working instability  
THEY DID NOT GET BETTER DOING THINGS IN EXTENSION)  
Terminal Extension  
(GOOD FOR SOME PATIENTS - BAD FOR OTHERS)  
Compression and noise  
(Medial push made it happy!)**

**How we (I) got here  
Sometimes proximal - hip “weakness” was obvious and “got them better”  
Sometimes excessive pronation was obvious and “got them better”  
(remember the other limb)**

***Bolgia, et al*  
(PhD Dissertation – UK – 2005- JOSPT - 2008)  
■Significant hip “weakness” with patello-femoral pain subjects – Consistent with  
our theory of proximal issues with both ACL and PF (hip/knee positions)**

**How about “below” – “the foot”  
■Should we consider foot orthotics & “why”**

**Generally speaking:  
Treatment and Prevention of lower extremity pathology or abnormal positioning  
which increases injury risk  
Epidemiology/Frequency of Problem  
■About 35% of Bony lower leg symptoms  
• Yates AJSM 2004;32:772-780**

■ **About 20% of all Athletic “injuries”**

- **Dehaven AJSM 1986;14:218-224**

What does Pronation do?

■ **Results in:**

- **Functional Knee Valgus**
- **Significant Femoral and Tibial IR**
- **Loading changes in the extremity**
  - **eversion @ heel strike**
  - **Knee Flexion**

McClay Clin Biom 1998

**Low Arch Problems**

- **Often “Over-use” related – Functional pes planus – “medial collapse”**
- **Knee Pain – Often soft tissue related – Medial complaints most common**
- **Williams DS Cin Biom 2001;16:341-347**

What we see RE Pronation and PF Pain Patients

- **Tibia & Fem Rotation**
  - **Salsich JOSPT 2007**
- **dorsiflexion with tight Achilles**
  - **Kaufmann AJSM 1999**
- **Rearfoot varus may contribute to the PF symptoms**
- **Powers JOSPT 1995**

High Arch - Cavus

- **Pattern of Knee Flexion (excursion)**

- **Leg Stiffness**

- **Early VL Firing**

- **Williams DS Gait & Posture 2004**

Gender Concerns

- **Hip Adduction and IR – relative Knee Abduction**
  - **Ferber Clin Biom 2003**
- **Hip & Knee ROM-ROM**

■ **Time to peaks Significant increases in ground reaction forces**

- Schmitz Clin Biom 2007
- Med/Lat Displacement – SLL
- Ford KR Clinical Biom 2006

SO Orthotic use is most commonly associated with:

- “Pronation”
  - Calcaneal Eversion
  - Pronation with forefoot varus
  - IR of the Tibia

Genova JOSPT 2000

McPoil J Am Pod Med Assoc 2000

**SO it can be:**

**A Problem above or below or at the knee itself – hence appropriate examination is the key – to then allow us to match the protocol focus.**

**Example follows:**

**Articular Cartilage**

**Structural Considerations**

- **Gliding Zone**
- **Transitional Zone**
- **Radial Zone**
- **Tidemark**
- **Calcified Zone**
- **Subchondral Bone**

**Articular Cartilage**

**Makeup - Components**

- **Collagen**
- **Proteoglycans**
- **Water**
- **Chondrocytes**
- 

**Articular Cartilage**

**Mechanical Considerations**

- **Proteoglycans / Water Affinity**
- **Fluid Egress & Absorption**
- **Slick Fluid Covered Surface with “Collagen” Stiffness**
- **Descriptor: Teflon Coated Bobsled Run !**

**Rehabilitation Concepts**

- **Traditional Single Protocol - Insufficient Process**
- **Clinical Perceptions & Science are Needed - Required for Success !**
- **Standard of Care is Appropriate**

■(Consensus Model ) - We use the concept of an Evaluation Based Protocol

What do we control ?

ROM of Contact (PF & TF)

Length of Time (&)

Level of Pressure Applied to the Surface

Activation Type

Motor Program / Pattern

Open / Closed : Shear / Compression

External Modifiers

Example: Evaluation Based Process

Articular Cartilage :

Typical presentation;

(What is the story - trauma, insidious , etc ?)

Are there things to avoid ?

What do we have to offer?

Remember : you can only do so much!

Articular Cartilage Exercise Concepts

■Control Shear Forces - Submaximal Exercise, High Speed Exercise, Partial ROM Exercises (Painfree)

■Decrease Maximal Loads - Pool & H2O Programs

■Walking - But limit Fatigue

■Combine Open & Closed Chain Appropriately

■Limit ROM of Some Exercise Devices - Stair/CC Units

■

This led to:

Four Approaches or Protocols

Matched to underlying structural problem/cause at the knee:

1)Instability 2) Tension

3) Friction 4)Compression

Extensor Mechanism

■Category 1 Ligamentous Instability

■Category 2 Tension Problem

Extensor Mechanism

■Category 3 Friction Problem

■Category 4 Compression Problem

■

Category Delineation

■Ligamentous Patellar Instability Passive & Active

■ Dislocation

■ Subluxation

■ Patellar Control Problems - Ligament &/or Muscle

■ **Tension Problems**      Inability of the M-T Unit to Dissipate High Tension Loads - Often Degenerative Problem

■ **M-T Strain (Insertions                      or Junctions)**

■ **Tendon - itis/osis**

**Category Delineation**

■ **Friction Problems**    Soft Tissue Irritation often related to Repetitive Flex/Ext in a loaded state

■ **IT Band Friction Syndrome**

■ **Bursitis**

■ **Fat Pad Syndrome**

■ **Compression Problems**    PF & TF can be involved - Often related to loads & Wt. Bearing

■ **Osteoarthritis**

■ **Articular Defects**

■ **Abnormal Muscular Absorption**

■

**Ligamentous Instability**

■ **Avoid Terminal Extension !**

■ **Exercise in the Groove ( Lower ROM - Patella within the Sulcus )**

■ **Fingers - Tape - Brace - Get the Patella Medial for Exercise - We must be Painfree !**

■ **Remember Gluteals, Abductors, & Adductors**

■ **Strengthen the “Quadriceps”**

■

**Tension Problems**

■ **Avoid High Speed Isokinetics**

■ **Emphasis to Eccentric Maximal Exercise**

■ **Use Plyometrics but late in Rehab Sequence (Advance weight prior to Speed)**

■ **10 - 12 Week RULE !**

■

**Friction Problems**

■ **Avoid Repetitive Flexion/Extension Loaded Patterns**

■ **Avoid High Speed Isokinetics**

■ **Multiple Angle Isometrics & Partial ROM Exercise Sequences**

■ **Modify footwear if Pronation Related but Remember other Leg !**

**Compression Problem**

■ **Painfree Exercise - Partial ROM - Multiple Angle Isometrics**

■ **Avoid Full ROM Loaded Activities that Cause Pain - SOF Inserts**

■ **Strengthen the Quadriceps - Open & Closed Chain but Painfree - Don't Abuse the Damaged Surface**

■ **High Speed Isokinetics Can Be Used !**

**PF Classification (JOSPT- 1998)**

- **Patellar Compression Syndromes**
- **Excessive Lateral Pressure Syndrome (ELCS)**
- **Global Patellar Pressure Syndrome (GPPS)**
- **Patellar Instability**
- **Chronic (Recurrent) Patellar Subluxation**
- **Acute Patellar Dislocation**
- **Recurrent Patellar Dislocation**

**PF Classification (JOSPT-1998)**

**Biomechanical Dysfunction Including: Foot, Limb Length, and Flexibility Deficits**

**Direct Patellar Trauma**

- **Articular Lesion**
- **Fracture**
- **Fracture /Dislocation**
- **Articular Lesion with Associated Malalignment**

■

**PF Classification (JOSPT-1998)**

**Soft Tissue Lesions**

- **Suprapatellar Plica**
- **Fat Pad Syndrome**
- **Medial PF Ligament Pain**
- **IT Band Friction**
- **Bursa (itis, etc.)**

■

**Overuse Syndromes**

- **Tendinitis**
- **Tendinosis**
- **Apophysitis (Patellar Pole - Jumper's Knee {SLJ Disease}) ; Tibia - Osgood. Schl. Disease**

**PF Classification (JOSPT-1998)**

- **Osteochondritis Dissecans**
- **Neurologic Disorders**
- **Reflex Sympathetic Dystrophy (RSD) - Complex Regional Pain Syndrome**
- **Sympathetically Maintained Pain (SMP)**

■

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Your  
Protocol  
For ???