When Good Knees Go Bad

REMINDER:
Obtain medical clearance and physician’s release prior to beginning an exercise program for clients with medical or orthopedic concerns.

Knee Anatomy & Mechanics
- Bones
  - Femur, tibia, fibula, patella
- Ligaments
  - Adl, pcl, lcl, mcl
- Meniscus

Anatomy of the Knee
- Quadriceps
- Quad tendon
- Patella tendon
- IT band
- Gluteus medius/ max
- Hamstrings
- Gastrocnemius

Joint-by-Joint Approach
- Poor hip and/or ankle mobility increases the mobility demands on the knee

Steps to Effectively Managing Knee Injuries or Conditions
1. Understand the condition
2. Avoid exercises or movements that cause pain or discomfort
3. Implement strategies to address the common causes of the condition
4. Refer to PT if new pain or progression occurs

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Common Knee Conditions/Injuries
- Anterior Knee Pain
- Meniscus Injury
- Degenerative Arthritis

Anterior Knee Pain (AKP)
- Patellofemoral pain (PFPS)
  - I.E. Runner’s knee
- Patellar tendinopathy
  - I.E. Jumper’s knee
- Chronic degenerative condition
- IT band syndrome (ITBS)

Potential Causes of AKP
- Foot Abnormalities
- VMO/VLO Reflex Timing
- Gastrocnemius Tightness
- Hamstring Tightness/Weakness
- Hip Musculature Weakness
- Quadriceps Tightness/Weakness

PREVENTIVE STRATEGIES
- Improve inadequate ROM of lower body joints
- Avoid or “modify” activities that worsen condition
- Foam rolling & stretching:
  - Quadriceps, IT band, psoas, hamstrings
- Strengthening:
  - Quadriceps, glutes, (esp. Glute medius) hip flexors
- Braces, Taping and Supports

Meniscus Tears
- Results from flexion and rotation of the knee as in cutting or changing direction
- Older adults are prone to tears due to degenerative weakness
- Low-level swelling following activity that causes friction is common

Managing Meniscus Injury
- Discuss inflammation management with physician
- Avoid deep knee bending
  - Deep squats and lunges
- Maintain a vertical shin
- Avoid locking out the knee
- Avoid or modify impact activities
Training Around Knee Arthritis

- Decrease BW
- Up to 80% reduction in pain with well-rounded exercise program
- Yoga/tai chi
- Hydro-aquatic exercise
- Strength/cardio

Stability Ball Wall Squats or Wall Sits

Adapting Cardio for Knee Pain

- Repetitive stress & chronic knee pain
- Recommendations
  - Cross-training
  - Interval training
  - Aquatics
- Recovery
  - Ice & massage

Strong Ankle & Hip Joints Make Happy Knee Joints

Ankle Range of Motion

- 10-30° of Dorsiflexion w/ knee extended
- Assessment
  - Stand with foot 6" from wall
  - Without lifting heel attempt to touch the wall with the knee

Role of Glutes

- Ability to control frontal and transverse plane hip motion impaired in those with PFPS
Strengthen the Glutes in all Planes of Motion

- Weak hip abductors & external rotators common in knee pain
- Use multi-vector and loading to optimize strength of the hip muscles

Band Resisted Hip Extension

- Resist direct line of pull through glutes
- Reduces force placed on lumbar spine
- Great drill for teaching hip hinging
- Add KB, BB, DB for advanced version

Bulletproofing Your Knees

- Stretch quadriceps
- Do mobility and proprioception drills for ankles and hips
- Strengthen glutes, quads and hamstrings
- Include single leg work
- Learn to squat, lunge, jump, and run efficiently

Rear Foot Elevated Split Squat

Clamshell

Glider Pistol Squat

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Anteromedial-Posterolateral Lunge
• Leg exercising is stationary
• Mobile leg reach across the front of the body and then back
• Foot of the stationary Leg maintains full contact with the ground

Glider Curtsy Lunges
• Only allow slight cross behind.
• Watch for rotation of front knee
• Those with better hip mobility can increase ROM

Single Leg Eccentric Leg Curls
• Contra-lateral resistance encourages free limb/hip to maintain alignment
• ROM restricted by hip extension on free hip

Single Leg Reach / RDL
• Use bilateral exercises
  – Squat
  – Leg press
  – Knee extension
  – Leg curls
• Do hamstring and glute activation drills 1st

Integrated Ankle- Knee-Hip Drills

Glider Triple Flexion
The Knee: Top Training Trends for 2017

1. Improving acceleration/deceleration
2. Mastering directional changes
3. Landing mechanics
4. Resisted running

Resisted Backpedal To Deceleration

Deceleration Lunges

- Band increases the demand to decelerate
- Increased eccentric forces
- Improve knee stability and strength

Multi-directional Resisted Agility Training

Jumps & Landing Mechanics

- Implicated in most forms of knee pain and injury
- Teach client to land on ball of foot with chest directly above and back extended
- Immediately upon ground contact... “sit back” and drop to the heels
- Client should squat slightly to absorb the ground reaction forces

Jump Training Basics

- Requires coordination
  - Sustain posture
  - Immediately flex knees after ground contact
  - Dynamic muscle control
  - Eccentric strength
- Flexibility
- Conditioning
  - Role of fatigue
Mini Band In & Out Hops

Clock Hops
- Start in the center and hop from one leg to other
- Must “stick” the landing before hopping back
- Increase speed to challenge more

Single Leg Box Drill
- Start slow
- Must demonstrate stability on landing
- Hop in one direction first then repeat opposite direction

Plyo Lunge

Monster Band Broad Jumps

Monster Band Split Jumps

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