



# Benefits and Risks of Cardiovascular Exercise and Strength Training on Knee Health

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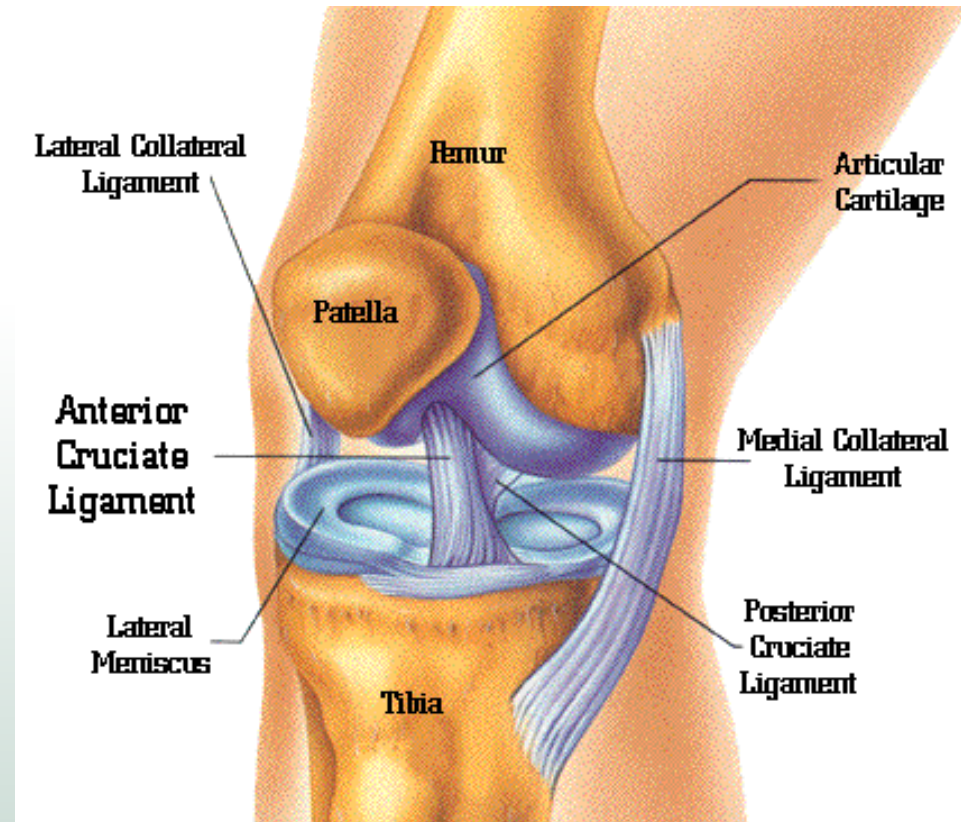
Orthopaedic Knee and Shoulder Surgery



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# Basic Knee Anatomy

- Knee
  - Femur (thigh bone)
  - Tibia (shin bone)
  - Patella (kneecap)
- Cartilage
  - Smooth surface lining the ends of bones contacting one another
- Arthritis
  - Loss of cartilage on both sides of the joint



# Scope of the Problem

- Knee arthritis is VERY common
  - >9million Americans
  - 9.6% men, 18% women >60 yo
- The number of older adults is increasing
  - Older individuals are more active and WANT TO STAY THAT WAY



**INVESTIGATE THE  
SCOPE OF THE  
PROBLEM.**

# Symptoms

- Pain
- Swelling
- Increasing Stiffness



**HOW CAN WE IMPROVE KNEE  
HEALTH?**

# Weight Loss and Knee Pain

- Knee is exquisitely sensitive to body weight
- Each pound of body weight lost = 4 pound reduction in knee joint stress
- \*Obesity is risk factor for complications with surgery\*



# Strength Training/Aerobic Exercise

- Studies have repeatedly shown that therapy can reduce pain and improve function in patients with arthritis
- **Muscle strengthening** can improve pain
- **Aerobic exercise** can improve function



# Strength and Exercise Myths

- **Exercise and strength training can increase risk of arthritis**
  - Evidence suggests that increased levels of exercise lower the incidence of musculoskeletal disability, reduce pain, and increase functional capacity
  - Distance running does not seem to induce changes in joints or increase risk of OA
- **Individuals with arthritis should not engage in strength training or exercise activities**
  - Evidence suggests those who do moderate exercise can expect reduction in knee pain and disability for the duration of intervention



# What are the best aerobic and strength exercises for knees?

- None
- All

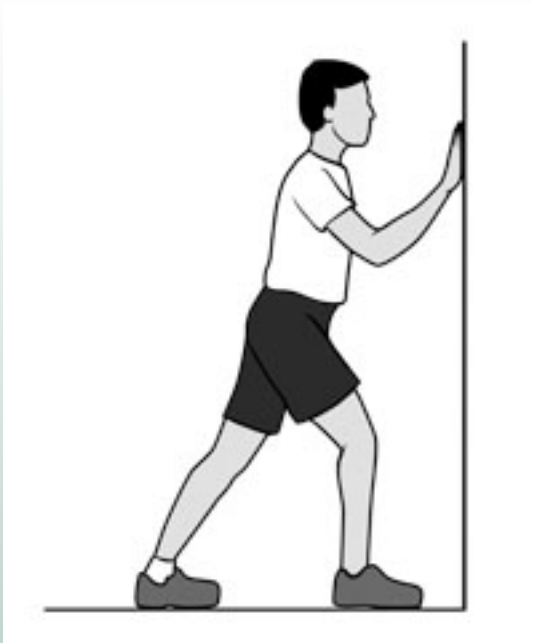
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# Important Principles and Concepts

- Low intensity/duration at outset
- Gradual increase in intensity/duration
- Good form/technique
- Titrate activities according to any symptoms
  - Modify or stop activity if it hurts!
- Avoid extreme sports and trauma

# Tips

- Emphasize hip and ankle flexibility and strength



Calf Stretch



Quad Stretch



Hamstring Stretch

# Tips

- Forget about isolating VMO (vastus medialis obliquus)
  - You can't physically do it!



# Tips

- Strengthen gluteus muscles and hip abductors as well as calf muscles!



Straight leg raise - supine



Straight leg raise - prone



Hip Abduction



Hip Adduction



Calf Raises

# Tips

- Balance agonist/antagonist muscle groups
  - Quadriceps/hamstrings



# Tips

- Work on single leg exercises
  - Decrease imbalances between legs
  - Improve balance and proprioception



**THANK YOU FOR YOUR ATTENTION!**