How to Manage Common Injuries

Prevention, Recognition, Treatment

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Agenda

- Mission: discuss most common running/cycling injuries – how to prevent, how to recognize, how to treat
- Injury **Prevention**
- Recognize Common running and cycling injuries :
  - Stress Fractures
  - Cartilage / Bone overload
  - Patellofemoral Pain Syndrome
  - Tendonitis – Achilles, Patella, Quadricep
  - Bursitis - IT band, Greater Trochanter, etc
  - Neck / Back Pain
  - Nerve conditions - Cyclist Palsy, Carpal Tunnel syndrome, Foot numbness and tingling
- **Treatment** Options

10 Tips to Preventing Sports Injuries

1 - Train Smarter, not more often
2 - Warm Up gradually
3 - Dynamically stretch prior to exertion
4 - Cross Train
5 - Static stretch after exertion and on rest days
6 - Use proper equipment and technique
7 - Listen to your body
8 - Allow time for muscle Rest and Regeneration
9 - Intake proper Nutrition and hydration
10 - Develop healthy Sleep habits

(All Equally Important !!)

Train Smarter, Not More Often

- Be mindful about how you work out and train
- Have a Goal and a plan with a schedule
- Interval training

Fasting cardio ?

Blood flow restriction therapy?

Cryotherapy ?

- Strength Training
- Cardio Training
- Optimized Nutrition

- Do your homework and research, don’t get sucked into temporary trends.

Warm Up

- Gradually increase heart rate and circulation
- Loosen the joints
- Increase blood flow to the muscles

Warm up is a good time to:

- Prepare mentally, rehearse strategy
- Practice skills and technique

Stretching type Comparison

- Dynamic Stretching – before exertion/run/bike

- Static Stretching – on off days, after exertion/exercise

Dynamic vs Static Stretching

- Dynamic Stretching
- Warming up the muscles
- Increasing blood flow
- Priming the muscle and tendon fibers for exercise
- No micro tears
- Avoiding injury prior to exercise

- Static Stretching
- Good for Lengthening muscles for future flexibility
- Creating micro tears
- Muscle/tendon eventually heals longer
- Muscles temporarily injury prone prior to exercise

Stretching type Comparison

- Dynamic Stretching – before exertion/run/bike

Dynamically balance and Alternate legs

- Static Stretching – on off days, after exertion/exercise

Cross Train

- Training Schedule :
- Jog – M, W, Sat
- Cross train – Tues, Fri
  - Any activity primarily using different muscle groups or movements
- Rest – Thurs, Sun
  - Regeneration of the muscles and bone

<u>Example for a Runner</u>

Monday- Run (intervals)

Tues- Cycling, weight lift (upper)

Wed- Run

Thurs- Rest, stretch, yoga

Friday- Elliptical or swim

Saturday- Run (Endurance)

Sunday – Rest, Meditate

Proper equipment and technique

- Get all your joints involved from toes to hips
- Don’t heel strike and crush cartilage
- Midfoot strike (sprint and train with forefoot)
- Proper padding and shoe shape
- Muscle activation kinetic chain
- Be in Flow
- Proper Form / bike settings

Proper equipment and technique

- Weight forward, like falling downhill, let gravity pull you forward

Ask a coach to fill you on all the minute details of proper and the most efficient technique and training methods

Listen to your body

- Aches mean pay attention, maybe slow down
- Find optimal heart rate
- A muscle burn is fine for a short time – lactic acid
- Pain means stop
- Pain means stop
- Pain means stop unless it's a race

- **exercise** within 55 to 85 percent of your maximum **heart rate** for at least 20 to 30 minutes to get the best results from aerobic **exercise**. The MHR (roughly calculated as 220 minus your age) is the upper limit of what your cardiovascular system can handle during physical activity.

Muscle Rest and Regeneration

- Allow recovery and regeneration after a race
- Allow muscle regeneration between hard/stressful workouts

Build muscle

Avoid Scar tissue and tendinosis

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7 - Listen to your body

8 - Muscle Rest

9 - Nutrition and hydration

10 – Sleep

***I would encourage independent study on these topics, never stop learning, see Healthy Living Handout on www.AndrewMorrisMD.com (patient education tab) for a few details on Fitness, Stress Management, Nutrition and Sleep hygiene

Types of Injuries

- **Overuse** injuries
  - Occur over time from repetitive trauma to the tendons, bones, and joints

- **Acute** injuries
  - Usually result from a single traumatic event
    - Muscle sTrain, ligament sPrain, fracture, rupture (T for tendon, P -> b for bone)

Stress Fractures

- Repetitive loading to a bone rather than a single traumatic event.
- Microdamage from repetitive stress accumulates in a bone and overwhelms the body's reparative process.
- <u>Common bones effected in runners</u>
  - Hip (femoral neck)
  - Tibia
  - Foot (heel, metatarsals, navicular)

Stress Fractures

- Common Features
  - Impact/repetitive exercise
  - Insidious onset of pain
  - Change to an increased training schedule
  - Pain with weight bearing / relieved with rest
- Exam
  - Swelling and localized tenderness noted
  - Xray changes occur only after 3-4 weeks of symptoms
  - Bone scan/MRI scan necessary to identify

Stress Fractures

- Treatment
  - Modify or stop training
  - Protected weight bearing
  - Surgical stabilization in some cases

Patella Tendonitis

- Patellar Tendonitis:

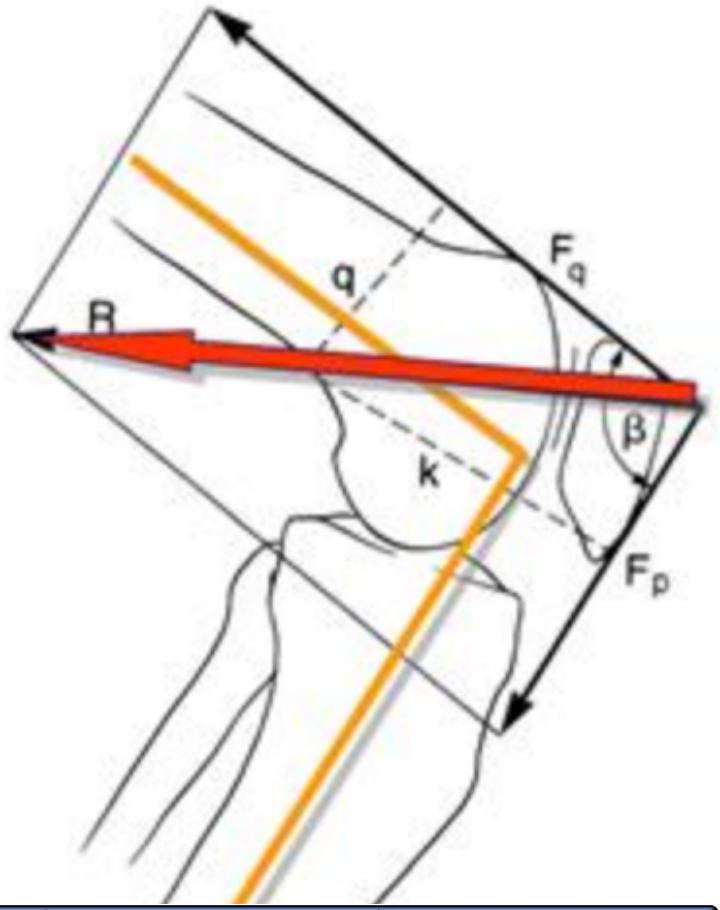
–One of the most common clinical complaints

–Up to 25% of athletes complain of anterior knee pain

- Prevalence is 2.5% - 14.4% in nonelite athletes
- Depends on the sport
- –Twice as common in males

Causes of Runner's Knee

- The patella being out of alignment
- Overpronation
- Overuse
- Previous injury
- Weak quadriceps or hip muscles
- Incorrect or worn shoes



- –Increased height
- –Increased body weight
- –Unbalanced quad strength/flexibility
- –Hamstring inflexibility

Losing just 5 pounds

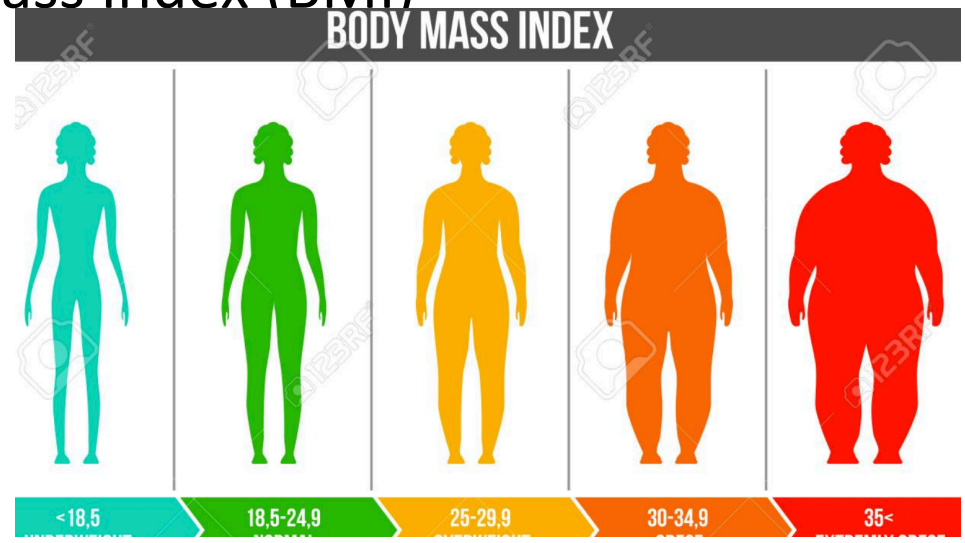
makes a difference! →

Activity	Force	% Body Weight	Pounds of Force
Walking	850 N	½ x BW	100lbs
Bike	850 N	½ x BW	100lbs
Stair Ascend	1500 N	3.3 x BW	660lbs
Stair Descend	4000 N	5 x BW	1000lbs
Jogging	5000 N	7 x BW	1400lbs
Squatting	5000 N	7 x BW	1400lbs
Deep Squatting	15,000 N	20 x BW	4000lbs

Prevention of Runner's Knee

- Strengthen and condition upper leg and hip muscles
- Avoid excessive downhill running and cambered roads
- In off days Stretch quadriceps, hamstring, IT band, and gluteal muscles
- Correct shoes or orthotics
- Always work on the joints above and below
- Be a healthy weight, 19-25 Body Mass Index (BMI)

*Easy for a muscular person to be mistakenly labeled overweight but be honest with yourself, is that Really why your in that category ?



Tendonitis

- Tendinopathy

–Pathologic change in a tendon

- Tendinosis

–Degenerative pathologic condition **without** inflammatory change

- Tendinitis

–Degenerative pathologic condition **with** an inflammatory process

Tendonitis

"**Overload**" of tendon tissue is key to the pathologic process

–Unable to respond adequately to the load over time

–Incremental weakening and eventual failure

Chronic repetitive damage accumulates over time

–↑ incidence with increasing age

–↑ incidence in the athletically active

Tendons thought to have a limited blood supply

--When subjected to heavy training the demand outpaces the vascular supply

–Pathologic tendons seen to have neovascularization

Achilles Tendon Injuries

Similarities in presentation and treatment with Patella, Quadricep, and all body region Tendonitis exacerbations

- Achilles tendon:
  - Largest tendon in your body
  - Connects the calf muscles to the back of the heel bone and must withstand large forces during sporting exercises and pivoting
  - Over time, inflammation can produce a covering of scar tissue, which can tear or rupture
  - There are two main types of injuries: overuse and inflammation, called Achilles Tendonitis may be intrasubstance or insertional

Achilles Tendon Injuries: Symptoms

- May experience mild pain after exercise that gradually worsens
- Mild swelling, morning tenderness, and stiffness may also occur, but may improve with use
- Dull or sharp pain anywhere along the back of the tendon but usually close to the heel

Achilles Tendon Injuries: Symptoms

- Limited ankle flexibility with redness or heat over the painful area
- Lumpy nodule on tendon
- Cracking sounds with ankle movement
- Tear of the tendon

Causes of Achilles Tendonitis

- Often occurs with rapid increase in the intensity of training or with new types of training when the body is not fully conditioned
  - Tight or fatigued muscles, which transfer the burden of running to the Achilles
  - Poor stretching
  - Rapidly increasing distance or over training
  - Excessive hill running or speed work
  - Incorrect shoes
  - Overpronation

Prevention of Achilles Tendonitis

- Appropriate stretching of tendon
- Correct shoes
- Strengthen foot and calf muscles
- Avoid excessive hill training
- Orthotics
- Regulate training schedule

Tendon Tear

- Any tendon may tear if it is overstretched.
  - Tear may be partial or complete
  - A snap or crack sound may be heard at the time of injury
- Signs of a Tendon Tear:
  - Pain and swelling near your joint
  - An inability to bend your joint or bear weight on the limb

Bursitis and Friction syndromes

- Examples:
- IT band
- Hip Bursitis
- Subacromial bursitis
- Infrapatellar bursitis

IT Band Syndrome (Iliotibial Band)

- Pain and inflammation on the outside of the knee. **Caused from**

friction of the iliotibial band against the lateral femoral epicondyle, compression of the fat and connective tissue deep to the iliotibial band, and chronic inflammation of the iliotibial band bursa.

IT Band Sydrome (Iliotibial Band): Symptoms

- Dull, aching pain shortly

  into a run
- Pain disappears after run

  but returns as severe, sharp pain later
- Pain is worse on downhill and crowned roads
- Local tenderness and inflammation

Causes of IT Band Syndrome

- Anything that causes the leg to bend inwards, stretching the IT Band against the femur
- Over training
- Overpronation (feet rotate too far inward on impact)
- Lack of stretching of IT Band
- Incorrect or worn shoes
- Excessive hill running or on crowned roads

Prevention of IT Band Syndrome

- Stretch IT Band, quads, hamstring, and gluteal muscles
- Strengthen quads, hamstring, and calf muscles
- Correct shoes
- Orthotics
- Avoid excessive downhill and stay on flat running surfaces

Nerve Compression Syndromes

- Examples: Thoracic outlet, Carpal Tunnel, Ulnar Tunnel (cyclist's palsy), Sciatica
- Caused by long Positional or anatomic changes
- Results in pain, tingling, numbness, eventual weakness

Non-Surgical Treatment

- The most important way to improve your condition is rest and rehabilitation.
- Physical Therapy sessions
- Professional Coach and trainer
- Deep Tissue Massage
- Weight loss if overweight
- Address Metabolism - Nutrition and Sleep Hygiene
- At home, general care involves “RICE”:
  - **R**est
  - **I**ce
  - **C**ompression
  - **E**levation

Non-Surgical Treatment

- Bracing and Orthotics
  - Braces or shoe inserts may be recommended to take pressure off of certain joints

Non-Surgical Treatment

- Nonsteroidal anti-inflammatory medications (NSAIDs) are helpful to relieve pain and inflammation
  - Side effects – GI side effects vs Cardiac vs Kidney
  - Dosing – taken routinely suppresses inflammation rather than occasional
  - Cost
- Selective Injections
  - Dexamethasone – water soluble joint injection
  - DepoMedrol or Kenalog – joint injection longer duration but possible precipitation of crystals
    - Mixed study results about whether or not it can harm cartilage
  - Betamethasone – Soft tissue

The End, Thank you, Any Questions ??

RECAP:

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JOINT PAIN ?

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See this power point and healthy living handout on website: