

TOUGHMAN TRIATHLON

“The Do’s and Don’ts”

Orthopedic Injury

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bodyworksmd™
PHYSICIAN GUIDED PHYSICAL THERAPY

Background

- Mount Sinai Medical School New York
- Orthopedic Residency @ MSH
- Fellowship Sports Medicine Univ. of Chicago
- Manhattan Orthopedic and Sports Medicine Group
- NYC Triathlon / Toughman Medical director
- Creator of BodyworksMD DVD series
- Endurance Junkie



TOUGHMAN TRIATHLON

- What you need to know

Be Prepared to Change Your Plan



TOUGHMAN TRIATHLON

- What you need to know

NUTRITION



TOUGHMAN TRIATHLON

- What you need to know

RECOVERY



TOUGHMAN TRIATHLON

- What you need to know

INJURY



INJURY

- MECHANISM

- Traumatic Injury

- Significant force to normal tissues that causes failure and injury
 - Fall / Direct Contact

- Overuse Injury

- Failure of tissue to less than maximal force.
 - Coat hanger analogy
 - Repetitive micro injury
 - Gradual onset

Overuse Injuries

- Top “10” List “ Why did it happen to me and how to I get better”

1. Injuries are not an act of God.
2. Injury indicates athlete has reached a breakdown point
3. Overuse injuries have a gradual onset
4. Early recognition the best cure
5. All injuries are curable
6. Treat both the cause and the effect
7. Equipment can make a difference
8. Rest is seldom the most appropriate treatment
9. Sleep....Sleep...Sleep
10. Seek out the help of an MD that is a like minded soul!

Overuse Injuries

- INJURY RECOGNITION

- Difficult

- Compulsive Nature of Running / Triathlon
 - No Obvious Injury
 - We are ALL BAD PATIENTS
 - Chronic Nature
 - Procrastination to Seek Help
 - No Obvious Signs of Injury Except Pain
 - Good Pain vs. Bad Pain

Overuse Injuries

- ANATOMY / PHYSIOLOGY

- Muscles

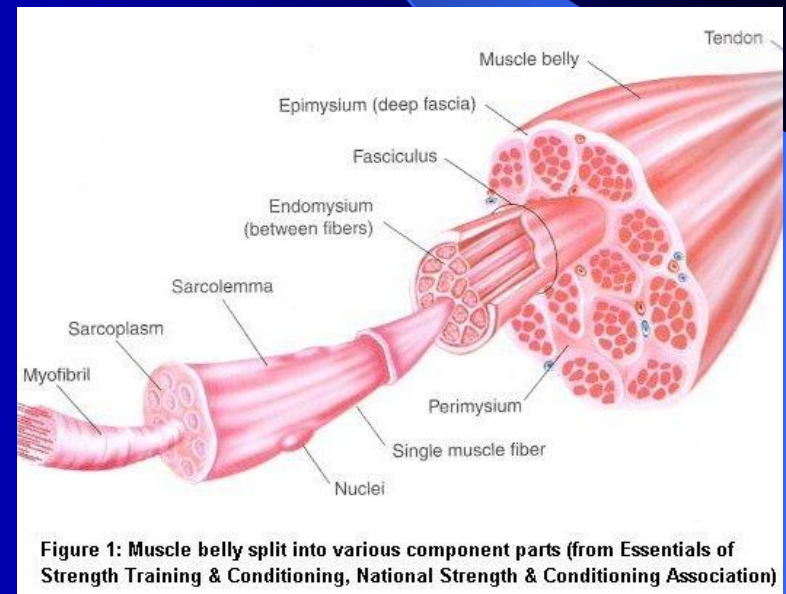
- Contractile Origin

- Isometrics
- Concentric
- Eccentrics

- Energy Systems

- Fascial Covering

- Response to Exercise



Overuse Injuries

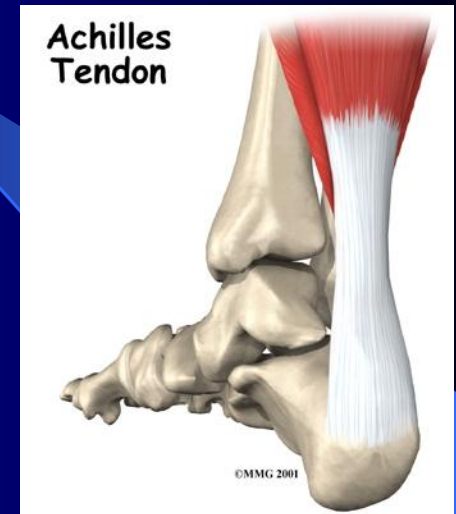
● ANATOMY / PHYSIOLOGY

– Tendon

- Fibrous Structure
- Tensile Strength
- Response to Stress
- Musculotendinous junction
 - Weak Link

– Ligaments

- Chronic micro tears lead to instability



Overuse Injuries

● ACUTE INJURY HEALING

- Initial response to tissue failure → Bleeding
 - Causes swelling and subsequent bruising
- Cellular recruitment → specific healing cells
 - Continued swelling
- Tissue organization and proliferation
 - Swelling plateau / pain subsides
- Tissue maturation → Normal tissue
 - Clinical and functional improvement
- 4-6 weeks average but can be longer

Overuse Injuries

● CHRONIC INJURY HEALING

- Initial response to tissue failure → Bleeding
 - Causes swelling and subsequent bruising
- Cellular recruitment → specific healing cells
 - Continued swelling
- **REINJURY / PERSISTANT OVERLOAD**
 - Altered Tissue organization and proliferation
 - Persistent swelling / Pain
 - Altered Tissue maturation → SCARRING
 - Clinical and functional impairment

Overuse Injuries

- TREATMENT

- RICE / RRICE
- ACTIVITY MODIFICATION
- EQUIPMENT MODIFICATION
- MEDICATION
- PROFESSIONAL INTERVENTION
- PREVENTION
 - Catch it before it catches you!



Overuse Injuries

- PREVENTION

- Stretching

- Controversial benefits
 - Injury prevention
 - Possible loss of performance
- Ballistic bad
- How long?
- Warm vs. Cold
- Maturity leads to stiffness → helps



Overuse Injuries

- PREVENTION

- Strength Training

- Age → loss of lean body muscle mass
- Loss of joint protection
- Isometric / concentric / eccentric /Plyometric



Overuse Injuries

- PREVENTION

- Rest and Recovery

- Allows for tissue repair, rebuild and strengthen
 - Replenish energy stores and repair damaged tissues
 - Better balance between home, work and fitness goals
 - Lack of can lead to Overtraining Syndrome:
 - General malaise, staleness, depression, decreased sports performance and increased risk of injury
 - Short and long term

Overuse Injuries

- PREVENTION

- Rest and Recovery

- Short Term

- Active recovery:

- Cool down period / Easy workout following days

- Allow tissues to repair and remove chemicals that build up from exercise.

- Post workout meal:

- Replenishing energy stores and fluids lost during exercise

Overuse Injury

- PREVENTION

- Rest and Recovery

- Long Term

- Seasonal training program

- Recovery days and weeks

- Cross training, modify workouts types, changes in intensity, time, distance

Overuse Injuries

- PREVENTION

- Rest and Recovery

- Immunity

- Regular moderate exercise boosts immunity
 - Cellular mechanisms improved

- Over-Training/Intense exercise

- Susceptible up to 72 hours after exercise
 - Cortisol (stress hormone) levels altered

Overuse Injuries

- PREVENTION

- SLEEP: How much is enough?

- Sleep deprivation: Scientific studies <4hours

- Glucose metabolism less efficient

- Leptin levels fall

- INCREASE FAT STORAGE

- Levels of Cortisol (a stress hormone) Increase

- Associated with memory impairment, age-related insulin resistance, and impaired recovery

- Decreased activity of human growth hormone

- Active during tissue repair

- Immunity Impaired

- Decreased ability to fight colds

Overuse Injuries

● PREVENTION

– Rest and Recovery

- Sleep Deprivation linked to Over-Training
- Mindset: More is better
- Recognition 1st line of defense: Warning signs
 - Lack of energy/soreness/drop in performance/INSOMNIA/illness/irritability/loss of appetite/injuries!
 - Measurements: Log book / Resting heart rate

– Treatment:

- Rest/Recovery: Physical / Mental / Dietary

Overuse Injuries

- PREVENTION

- Nutrition

- Calories burned should equal calories in
 - Balanced diet
 - Supplements
 - Vitamins
 - Antioxidants
 - Nutraceuticals : Glucosamine / Chondroitin sulfate

Overuse Injuries

- PREVENTION
 - Other
 - Equipment Modifications
 - Training Logs
 - Massage /A.R.T.
 - Braces
 - Activity Modification
 - Cross Training

Overuse Injuries

CASE EXAMPLES

Overuse Injuries

- DOMS

- Delayed onset muscle soreness

- Good or Bad?

Treatment

- Stretch
- Ice
- Cross Train
- Conditioning



Overuse Injuries

● CALF STRAIN

– Anatomy

- Gastrocnemius / Soleus / Achilles Tendon
- Musculotendinous Junction

– Mechanism

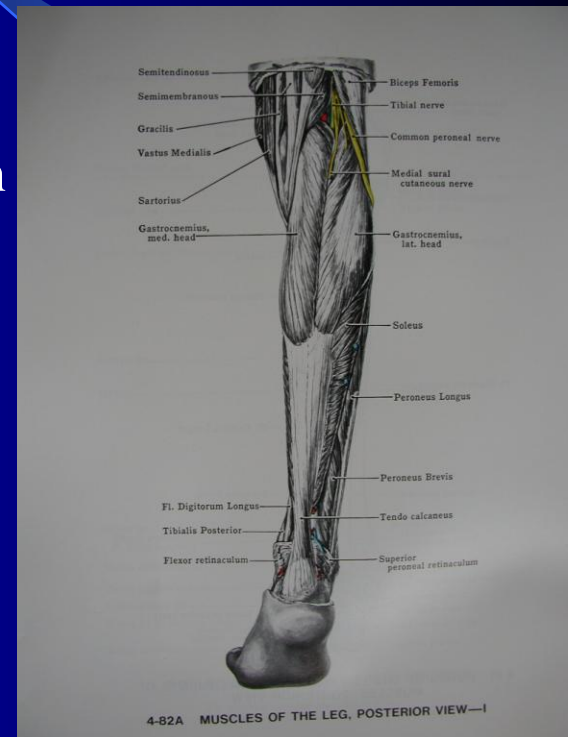
- Non Contact / Push Off

– Symptoms

- Feeling a “Pop” / Tightness / Cramp
- Difficulty with walking
- Swelling / Bruising (ecchymoses)

– Treatment

- Ice 24-36 hrs / Ace wrap / Shoe lift / Relative rest



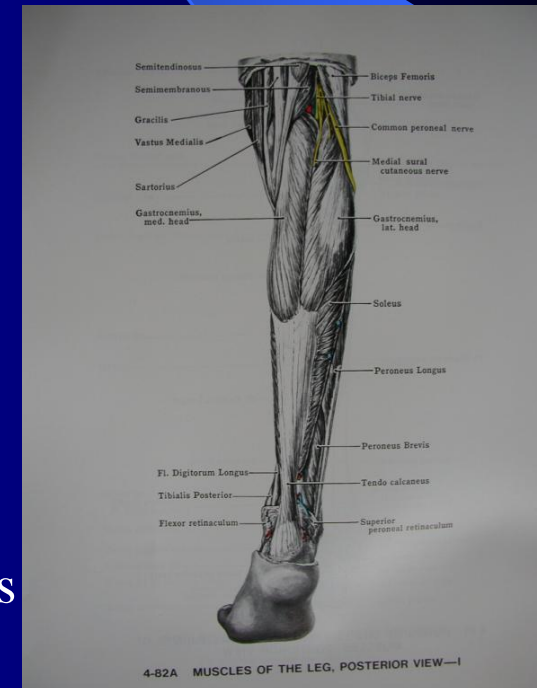
Overuse Injuries

● ACHILLES TENDONITIS

- Acute vs. Chronic
- Musculotendinous Region / Mid Tendon / Insertional
- Pain / Stiffness
- Warms up with Activity
- Symptoms Worsen After
- Swelling / Nodule
- Risk of Rupture

– Treatment

- Stretch / Ice / Act. Mod. / Heel Lifts /
- Physical Therapy / NSAID / PDF Injections



Overuse Injuries

- SHIN SPLINTS

- Anterior leg pain with activity
- Bad @ start → warms up → bad after activity
- Diffuse Tenderness on shins
- Can be Bilateral
- Differential diagnosis
 - Stress reaction / Stress Fracture / Exercise induced compartment syndrome

Overuse Injuries

- SHIN SPLINTS

- Treatment

- Make the diagnosis
- Activity Modification
- Ice
- NSAID
- Shoe modifications / Orthotics
- Physical Therapy → improve muscle imbalances
 - Flexibility
 - Strength

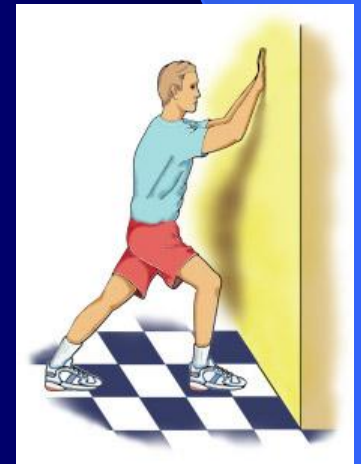
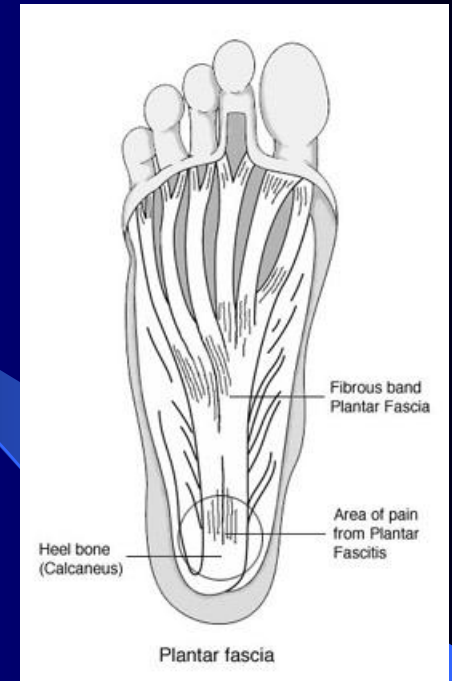
Overuse Injuries

● PLANTAR FASCIITIS

- The Bane of a Runner's Existence
- Heel Pain/Heel Spur
- Morning Pain
- Chronic Discomfort
- Referred Pain

– Treatment

- Stretch
- Ice
- Activity modification
- Shoe wear / orthotics
- Injections
- Physical therapy /Ultrasound
- NIGHT SPLINTS

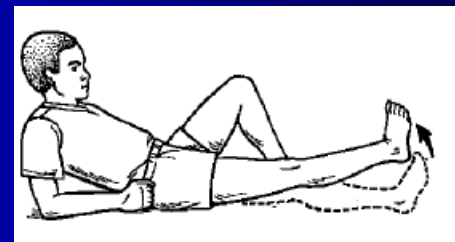
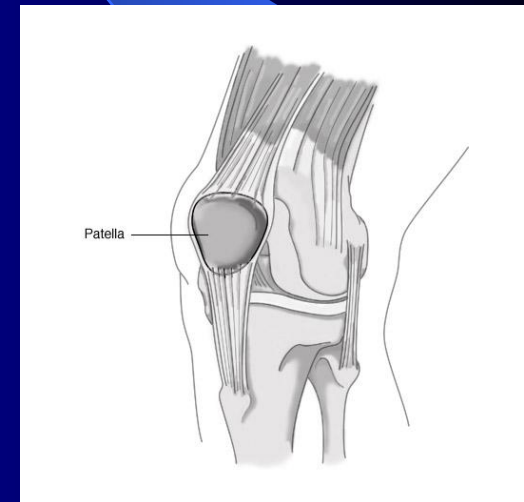


Overuse Injuries

- **RUNNER'S KNEE**

- Chondromalacia Patella / Patellofemoral Syndrome

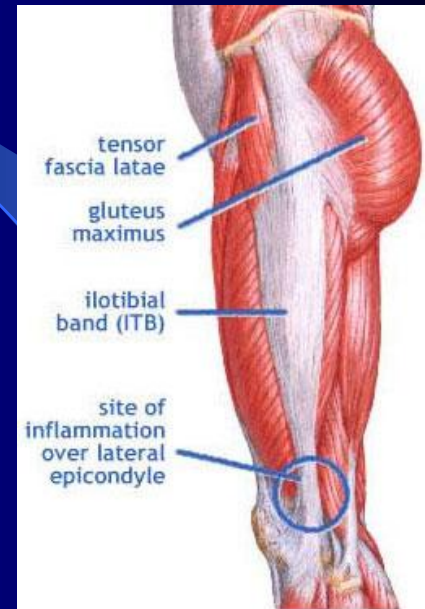
- Anterior Poorly localized Knee pain
- Worse with knee flexion activities
- Treatment
 - Stretch
 - Ice
 - Activity modification
 - Physical Therapy / Quad
 - Braces



Overuse Injuries

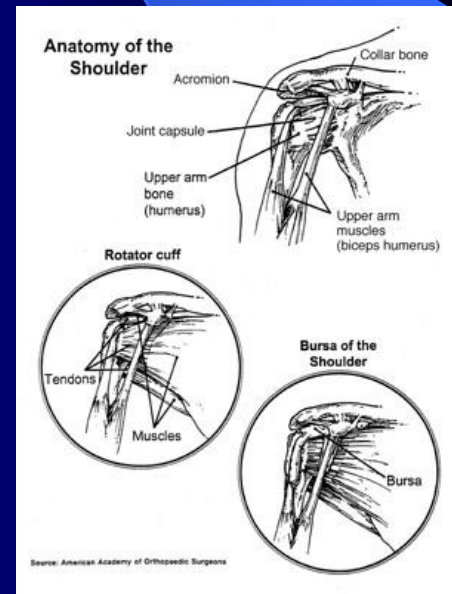
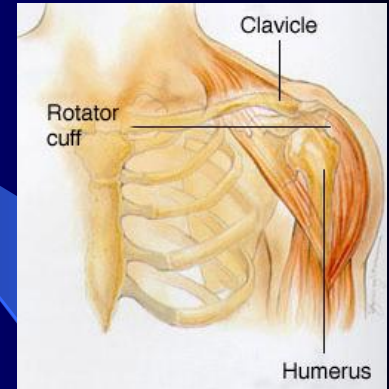
● ILIOTIBIAL BAND FRICTION SYNDROME

- Debilitating lateral knee pain
- Treatment
 - Stretch
 - Ice
 - Activity modification
 - NSAID
 - Injections
 - Physical therapy



Overuse Injuries

- **ROTATOR CUFF TENDONITIS / IMPINGEMENT**
 - Shoulder pain with overhead activity
 - Night Pain
 - Loss of motion
 - Associated neck and arm pain



Overuse Injuries

- RC TENDONITIS / IMPINGEMENT

- Treatment

- Stretch
- Ice
- Activity Modification
- Swim Instruction
- Physical therapy / Strength
- NSAID / Injections



Overuse Injuries

● BONE STRESS FRACTURES

– Foot

- Repetitive Stress to Forefoot.
- Second Metatarsal Most Common
- Acute Onset
- Pain / Swelling / Difficult Walking
- X-ray
 - Initial usually normal
 - 2 wks see calcification / callus
- Treatment
 - Hard sole shoe / Activity Modification
 - SWIM - SWIM - SWIM
 - 6-8 weeks healing time



X-ray of a soccer player who started having foot pain during preseason conditioning. The original X-ray was normal. This X-ray, taken four weeks later, shows the appearance of a healing stress fracture of the 2nd metatarsal.

Overuse Injuries

- CONCLUSIONS

- Activity = Health
- Injury → Breakdown of body system
- Early recognition + Appropriate modification =
MINIMAL LOSS OF TIME

Overuse Injuries

THANK YOU

