

**FOOT AND ANKLE OVERUSE
INJURIES
IN STANDARDIZED
EXERCISE PROGRAMS**

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SUBTITLED
"NEW YEAR'S
RESOLUTION
HEEL PAIN"

BACKGROUND FACTS

- Increase in physical activity started in 1970's with running craze
- 1980's-1990's saw an explosion of health clubs and fitness centers
- Currently in the US more than 90 million people are members of a fitness center, roughly 1 out of 3 people

HEALTHY PEOPLE 2010

- US Department of Health Human Services project
- Physical activity is the # 1 leading health indicator
- Obesity is the # 2 indicator

Despite these facts
the population of the
US is becoming more
obese

What Is Fitness?

- Defined as good health or physical condition, usually the result of an exercise program and proper nutrition
- 4 components of fitness
 - Body composition
 - Flexibility
 - Cardiovascular fitness
 - Musculoskeletal fitness

Factors that influence the desire to "be fit"

- Medical need to become fit
- Media influence
- Peer pressure
- Family pressure
- Social aspect
- Psychological aspect of obesity and fitness

Overuse Injuries

- Definition – bone, muscle or tendon microtrauma caused by repetitive stress without adequate healing time
- ½ of all pediatric sports injuries related to overuse

4 Stages of Overuse Injury Progression

1. Pain after activity
2. Pain during activity without affecting performance
3. Pain during activity affecting performance
4. Chronic pain at rest

Factors that influence overuse injuries

- Improper training
- Excessive stress on body part
- Improper use of equipment
- Overexercising
- Exercising through injury
- Psychological aspect

Children at Higher Risk?

- Growing bones
- Inability to recognize signs of injury
- 30-45 million youth 6-18 yo participate in organized athletics
- Increase due to accessibility of athletic programs
- Overtraining can cause injury which can cause “burnout” and discourage later fitness activities

Types of injuries

- Tendinitis
 - Achilles
 - Peroneal
- Capsulitis
- Strains
- Plantar fasciitis
- Shin splints
- Stress Fractures
- Calcaneal apophysitis

Posterior Problems

- Achilles tendinitis
- Sever's disease (aka calcaneal apophysitis)
- Gastroc/soleus strain

Achilles Tendinitis

- Inflammation of the Achilles tendon either in it's body or at the attachment to the calcaneous
- Commonly associated with a retrocalcaneal bursitis

Achilles Tendonitis

- Most common cause is overuse involving dorsiflexion which stretches and strains the tendon
- Stair stepper is common culprit



Achilles Tendinitis

■ Treatment

- Elevate the heel
- Control pronation
- NSAIDS
- Immobilize
- Physical therapy
- Rare steroid injection
- Rare surgical intervention

■ Prevention

- Decrease stressful dorsiflexion activities
- Keep feet perpendicular to steps
- Slow the pace
- Adjust the height of the steps (if possible) appropriately for the height of the person
- Cross training

Sever's Disease (Calcaneal Apophysitis)

- Inflammation of the posterior calcaneal growth plate
- Seen typically from age 10-15
- Resolves when growth plates close
- Aggravated by jumping and running sports

Sever's Disease

- Inclined treadmill is the worst fitness center culprit
- High impact aerobics 2nd



Sever's Disease

■ Treatment

- Heel lifts
- Rest
- NSAIDS
- Immobilization

■ Prevention

- Lower incline on treadmill
- Cross training

Lateral Problems

- Peroneal Tendinitis
- Lateral Ankle Sprain

Peroneal Tendinitis

- Inflammation of the Peroneal tendons on the lateral aspect of the foot and ankle
- Occasionally associated with a tendon tear

Peroneal Tendinitis

- Most common cause is inversion/eversion motion
- Calf strengthening exercises are culprits



Peroneal Tendinitis

■ Treatment

- Control inversion/eversion strain
- NSAIDS
- Immobilization
- Physical therapy
- Steroid injection
- Surgically repair tear

■ Prevention

- Strengthen inverters and everters
- Use more sagittal plane motion (dorsiflexion and plantarflexion) with less frontalplane motion (eversion/inversion)
- Cross training

Peroneal Tendinitis



Lateral Ankle Sprain

- Usually traumatic inversion injury
- Can occur with overuse if foot is overly inverted on heel strike

Lateral Ankle Sprain

■ Treatment

- Rest
- Ice after activity
- Compression
- Ankle brace
- Immobilization
- Lateral ankle surgical stabilization

■ Prevention

- Control inversion of the heel with valgus heel wedge
- Ankle taping
- Ankle brace

Plantar problems

- Capsulitis
- Plantar fasciitis

Capsulitis

- Inflammation of the plantar aspect of a metatarsophalangeal joint
- Usually caused by repetitive tiptoe activity

Capsulitis

- Common culprit is weight lifting
- Step aerobics
- Dance aerobics



Capsulitis

■ TREATMENT

- Relieve pressure on ball of foot
- NSAIDS
- Steroid injections
- Hammertoe repair, MTPJ release

■ PREVENTION

- Cross training
- Gradual increase in activity and weight lifted

Plantar Fasciitis

- Inflammation of the ligament that maintains the arch on the bottom of the foot
- The most common foot and ankle overuse injury
- Seen typically with sudden increase or change in weight bearing activity

Plantar Fasciitis

- Elliptical trainer and treadmill are common culprits



Plantar Fasciitis

■ TREATMENT

- Control strain of plantar fascia
- NSAIDS
- Steroid injections
- Immobilization
- Physical therapy
- Orthotics
- ESWT
- Plantar fasciotomy

■ PREVENTION

- Gradual increase in activity
- Stretching
- Cross training

Misc problems

- Stress fractures
- Chondromalacia Patella (patella femoral compression syndrome)

Stress Fractures

- Osseous reaction to repetitive strain
- Frequently happen to lesser metatarsals due to chronic strain on the ball of the foot

Stress Fractures

- Treadmill and step aerobics are common culprits



Stress Fractures

■ TREATMENT

- Eliminate activity
- Immobilization
- Bone stimulator

■ PREVENTION

- Gradual increase in activity
- Crosstraining
- Appropriate control of motion and strain in the shoe

Chondromalacia Patella

- Inflammation of the articular surface of the patella
- Caused by compensation at the knee due to excessive pronation of the foot

Chondromalacia Patella

- Running is worst culprit but seen commonly with biking



Chondromalacia Patella

■ TREATMENT

- Rest
- Ice
- NSAIDS
- Chopat's knee strap
- Orthotics

■ PREVENTION

- Cross training
- Control pronation with orthotics
- Adjust bike seat to correct position for 10-15 degree knee bend at full extension
- Strengthening of quads and hamstrings equally

Solutions to Overuse Injuries

- Encourage 1-2 rest days each week
- Limit increase of activity to 10% per week
- Encourage cross training
- Discourage single muscle training, encourage muscle group training
- Encourage cross training
- Emphasize fun, safety, sportsmanship
- Promote proper training techniques
- Focus on overall wellness and fitness

References

- US Department of HHS "Healthy People 2010
- APMA webpage
- Barclay and Murata; "Guidelines Issued for Overuse Injuries in Child and Adolescent Athletes"; Medscape.com June, 6, 2007
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Questions?

