Care of the Extreme Recreational Athlete

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Objectives

• Review current popular workout programs amongst the athletic population
• Review typical injuries encountered by athletes participating in these programs
• Review treatment options for these injuries

Extreme Conditioning Programs

• High volume, aggressive training workouts
  – Variety of high-intensity exercises
  – Timed, max number of reps
  – Short rest intervals
• Focus on functional movements
  – Favorite of military combatants
• Includes High Intensity Interval Training (HIIT) programs
• Studied in 2010 with “Consensus Paper on Extreme Conditioning Programs in Military Personnel”
  – Composed by Consortium for Health and Military Personnel (CHAMP) and ACSM
Extreme Conditioning Programs

• Who’s doing it?
  – Military
  – Special forces
  – First Responders
  – Weekend Warriors
  – Current/former athletes
  – Mom and grandmom

Popular Programs

• CrossFit
• P90X
• Insanity
• Gym Jones
• PT Pyramid

CrossFit*

• Workout regimen designed to develop a broad, general and inclusive fitness
  • Developed by Coach Greg Glassman
  • Designed to prepare trainees for any physical contingency
  • Constantly varied functional mvt
  • Performed at relatively high intensities
Crossfit

- CrossFit Community
  - Workouts done in groups
  - 5,500 affiliated gyms
  - 35,000 accredited trainers
  - CrossFit Journal
  - CrossFit Games
- Talking CrossFit
  - Affiliate-official CrossFit affiliate
  - AFAP-as fast as possible
  - AMRAP-as many reps as possible
  - Box-gym
  - WOD-workout of the day
  - SWOD-strength workout of the day

P90X

- Home workout program designed around muscle confusion
  - Created by personal trainer Tony Horton
  - Designed to avoid fitness plateaus
- 12 workout DVDs
  - Minimal equipment required
  - 90 day calendar

INSANITY

- Home program based on interval training
  - 10 workout DVDs
  - 60 day calendar
  - No equipment required
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<td>Push-up</td>
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### Air Squat

![Air Squat Image](image)

### Burpee

![Burpee Image](image)
INJURIES

Shoulder

- Rotator cuff tendonitis
  - Caused by microtrauma secondary to overuse
    - Particularly overhead lifts
  - Result of impingement of rotator cuff on coracoacromial arch
  - Often associated with proximal biceps tendonitis
    - High volume push ups
Shoulder

- Rotator cuff tendonitis
  - c/o pain, weakness and loss of motion
  - Difficulty reaching behind and overhead
  - Painful laying on affected side
  - Physical Exam
  - Treatment
  - Rest
    - NSAIDs, PT, Corticosteroid inj
    - Surgery for complete tears
    - PRP/Prolotherapy

Shoulder

- Osteolysis of the distal clavicle
  - Caused by overuse, particularly common in weightlifters
  - Primary complaint is superior shoulder pain
    - Pushups/bench press
  - Crossover test (+) on exam
  - X-ray, bone scan, MRI
  - Treat with activity modifications and NSAIDS
    - Distal clavicle excision

Wrist

- Sprain/Strain
  - Repetitive loading in extension
    - Pushups, front squats, cleans
  - Complain of pain with extension and gripping/lifting
  - Treat with bracing and rest
Lumbar

- Sprain/Strain vs Radiculopathy
  - Caused by fatigue and poor form
    - Performing heavy lifts late in workouts
    - Repetitive ab exercises
  - Complain of focal pain vs leg pain/numb/ting
  - r/o spondylolysis in teenagers
    - Stork test
  - Treat with rest, NSAIDs, core strengthening
    - Epidural for radicular symptoms

Lumbar

- Dead lift, Cleans, Snatch

Knee

- Patellafemoral pain
  - Generalized anterior knee pain
  - Predisposing factors
    - Quad strength imbalance
    - Patella malalignment
    - Increased Q-angle
    - Flat feet
  - Repetitive loading of the joint
    - Squatting, plyometrics, running
Knee

• Patellafemoral Pain
  – Pain with sitting and descending stairs
  – May complain of snapping/popping
  – Tenderness on exam
    • Pain with patella compression
  – Treatment
    • REST
    • Functional rehabilitation
    • Correct underlying abnormalities
    • Bracing

Knee

• Patella Tendinitis
  – Aka Jumper’s Knee-inflammation of patella tendon
  – Secondary to repetitive jumping activities
  – Primary complaint is pain with activity
    • More severe cases will have pain at rest
  – Treatments
    • REST
    • PT-eccentrics, ioni-/phonophoresia, modalities
    • PRP/Prolotherapy for refractory cases

Stress Injuries

• Overuse injuries along a spectrum ranging from microfracture to complete structural failure
  – Failure of osteoblasts to heal periostal resorption caused by osteoclast activity due to stress induced activities
• Tibia most common site
Stress Injuries

- Primary complaint is insidious onset of pain with activity
  - More severe injuries present with pain at rest
- Exam
  - Point tenderness
  - May even feel callus
  - Tuning fork test
  - Stork Test
- Radiographs
  - X-rays usually negative early
  - Bone Scan
  - MRI/CT

Stress Injuries

- Treatment
  - REST
  - Pain control: ? Use of NSAIDs
  - Bone Stimulator for chronic fx’s
  - Maintain fitness with no/low impact activities
    - Pool/elliptical
    - Begin when pain free at rest
  - Gradual return to impact activity

Medical Conditions

- 21 y/o WM presents with c/o B/L bicep pain x 2 days
  - Started after heavy arm workout with bodybuilder friend
  - Exam demonstrated mild-mod bicep tpt
    - No neurovasc changes
  - Returned to office 4 days later with increased pain and swelling right arm, mild erythema around elbow
    - Severe TTP on exam, no neurovasc changes
    - Doppler U/S negative
    - Started on Abx for suspected cellulitis
  - Called office next day complaining of tingling in R hand ➔ sent to ER
    - ER called to d/c pt, requested CK level ➔ 7,000
Medical Concerns

• Exertional Rhabdomyolysis
  – Breakdown of skeletal muscle secondary to prolonged, heavy, repetitious exercise
    • “Too much, too fast, too soon, too novel”
  – Present with severe pain and swelling
    • Dark brown urine
    • Significantly decreased performance
  – Predisposing factors
    • Heat, humidity, dehydration
    • Poor physical conditioning
    • Altitude, sickle cell trait, hereditary defects of ATP synthesis

Medical Conditions

• Exertional Rhabdomyolysis
  – History
    • Iowa football 2011
    • US Marines- 1960s
    • 3 college wrestling deaths 1997
    • Prisoners
    • Police and firefighting training
    • Multiple accounts in CrossFit

Medical Concerns

• Exertional Rhabdomyolysis
  – Often subclinical, maybe some dark urine
  – Diagnosed with elevated CK levels
    • Normal<200, acute cases up to 10,000
  – Treat with aggressive hydration
    • Monitor electrolytes
    • Severe cases may require alkalinizing urine
  – Complications
    • Renal failure
    • Acute Compartment Syndrome
    • Electrolyte abnormalities
SUMMARY

Positive Characteristics

• Variety of exercises
  – Resistance training
  – Running intervals
  – Bodyweight exercises
• High intensity metabolic conditioning
  – Improved fitness
  – Decreased body fat
• Focus on core strength
• Incorporates “functional movements”
  – Variety of multijoint and total body movements in multiple anatomical planes

Negative Characteristics

• Limited rest intervals
  – Early fatigue
  – Increased oxidative stress
  – Greater perceived effort ➔ loss of form
• Overuse/Overreaching/Overtraining
Recomendations

- Proper medical clearance
- Acclimatization
  - Gradual introduction and progression of advanced exercises, duration and intensity
- Supplemental conditioning programs during acclimatization period based on individual’s goals, experience and needs
- Include rest periods between sets and days of exercise
  - Planned periodization and variation
- Monitor for injuries or overtraining
  - Include periodic evals to track progress

References

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