INJURY PREVENTION AND TREATMENT OF THE SENIOR ATHLETE

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Course Overview

• This course will expand on findings from the Senior Athlete Fitness Exam (SAFE) in National Senior Games athletes. Content will review: typical injuries, risk factors and evidence-based treatment in this unique and growing population.

Objectives

• By the end of this 2-hour session participants will:
  2. Recognize key risk factors for injury in senior athletes.
  4. Discuss case scenarios and apply course content to create sample treatment plans.

Prevalence of Senior Athletes

• Approximately 10,000 athletes participate in National Senior Games events biennially
  • Master’s Level Competition is growing

Inactivity by Age

Sport participation by generation
Cardiovascular Changes with Aging
- VO2Max
- Heart Rate
- Stroke volume
- Cardiac Output
- Blood Pressure
- Arteriovenous Oxygen Differential
- Peripheral Vascular Resistance
- Baroreceptor Sensitivity
- Orthostatic tolerance
- Vessel Compliance

Pulmonary Changes with Aging
- Lung Compliance
- Conducting tubules
- Alveoli
- Skeletal muscle
- Ribcage
- Impairments in lung defense
- Spine

Musculoskeletal Changes with Aging
- Cartilage
- Joints
- Connective Tissue
- Skeletal Muscle
- Bone

Neurological Changes with Aging
- Functional changes
- Anatomical changes
- Physiological changes

The Senior Athlete Response to Aging
1. Cardiovascular
2. Pulmonary
3. Musculoskeletal
4. Neurological
GOLFERS

PHYSICAL DEMANDS
- Extended duration
- Quick bursts of activity
- Upright posture
- Balance
- Strength
- Flexibility
- Cardiorespiratory Endurance

Common Injuries
- Back
- Shoulder
- Elbows
- Wrists

Sport-Specific Recommendations
- Skill Training
- Strength Training
- Flexibility Training
- Regular warm up

Sport-Specific Recommendations
- Shoulder pain
  - Scap stabilization program
  - Rotator cuff strengthening
  - Modify stroke to a flatter swing plane to reduce impingement
- Back Pain
  - Strengthen Abdominals
  - Increase lead hip IR
  - Increase lumbar extension
  - Correct swing (don’t overrotate)

SWIMMING
PHYSICAL DEMANDS

• Repetitive UE use
  • Frequent practice (5-7x/week, twice daily)

• Cardiovascular Endurance

• Non-Weight Bearing

Common Injuries

• 40-91% have shoulder pain
• Glenohumeral laxity
• Rotator cuff lesions
• Biceps lesions
• Impingement

Sport Specific Recommendations

• Cross Training/reduce exposure
• Core endurance training
• Strength Training
• Pec Stretching
• Posterior Shoulder Stretching

• No clear prevention program exists.

TENNIS PLAYERS

PHYSICAL DEMANDS

• Overhead hitting
• Impact
• Endurance
• Speed
• Balance

Common Injuries

• Achilles rupture
• Medial gastroc tear
• Meniscal tears (medial or post horn)
• Rotator Cuff Rutpure/Tendonitis
• Degenerative change in knees
• Lateral epicondylitis
• Back Pain
Sport-Specific Recommendations

- Increase strength training
  - Abs
- Increase Flexibility
  - Gastroc/soleus
  - Adductors
  - Hamstrings
  - Lumbar Spine
  - Shoulder
- Include warm up prior to play

Rotator Cuff Pathology

<table>
<thead>
<tr>
<th>Age</th>
<th>Prevalence</th>
</tr>
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<tbody>
<tr>
<td>30-50</td>
<td>10%</td>
</tr>
<tr>
<td>60-70</td>
<td>50%</td>
</tr>
<tr>
<td>80-99</td>
<td>80%</td>
</tr>
</tbody>
</table>

- Pain vs. Intensity

RUNNERS

PHYSICAL DEMANDS

- Repetition
- Impact
- Endurance

Common Injuries

- 46% injury rate
- Increased incidence with age
- Multiple injuries were not uncommon

- Calf*
- Hamstrings*
- Knee
- Foot

*more common in older runners

TRIATHLETES
Physical Demands
- Repetition
- Impact
- Duration
- Accidents

Sport-Specific Recommendations
- Strength Training
- Intensity of Cardiovascular Training
- Cross-training
- Warm up
- Stretching
- Balance Training

GLOBAL RECOMMENDATIONS

Strength
- Strength training may be more critical in older athletes
  - Key areas
  - Frequency
  - Duration
  - Intensity
  - Mode
  - Core

Cardiovascular Training
- Intensity
- Time
- Mode
- Duration

Flexibility
- Problem Areas
- Consider the sport
- Mode
- Timing
**Posture**

- Trends

**Balance**

- Consider underlying variables

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**CASE STUDY**

78 yo Female Runner

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**Starting Exercise Late in Life**

<table>
<thead>
<tr>
<th>Cardiac Risk Factors</th>
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</thead>
<tbody>
<tr>
<td>Hypercholesterolemia</td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Diabetes</td>
</tr>
<tr>
<td>Family history of CAD</td>
</tr>
</tbody>
</table>

*If several then suggest a cardiac stress test
*low risk, no screening
*more likely to need screening with diabetes

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**Hx**

- 78 yo retired college professor
  - Running history: ½ marathon at 72
- Medical history
  - Osteopenia
  - Bil frozen shoulder
  - DDD per MRI (2014)
- Current Status
  - Pain in bil LE R>L
  - Pain in LE (right hamstring) and back with running or fast walking
  - Limited participating in some fitness classes

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**Starting Exercise Late in Life**

- OA is not a reason to limit exercise
- Evidence supports exercise and dynamic movement
- Avoid pain
- Avoid joint trauma
Benefits of Staying In the Game

- Morbidity
- Mortality
- Strength
- Balance/Falls
- Flexibility

As a group....still waiting to plateau.

References