Primary Care Sports Medicine: Principles and Reasons for Referral

Ricardo Guirola MD M Ed
Rheumatology and Sports Medicine

Objectives

• Discuss basic principles of Primary Care Sports Medicine
• Discuss principles of biomechanics in overuse injuries and prevention of injuries
• Discuss current implications on cardiovascular screening
• Discuss importance of pre participation sports physicals
• Discuss early sport specialization
Primary Care Sports Medicine

- Care of sport related and general medical needs of athletes
  - Weekend Warriors
  - Active individuals

Primary Care Sports Medicine

- Coordination of care of patients
  - Athletic trainers
  - PT
  - Orthopedic surgeons
  - Nutrition
  - Psychologists
- Team Physicians
- Communication
Primary Care Sports Medicine

- Special Populations
  - Youth
  - Geriatric
  - Disabled
  - Pregnancy

Biomechanics and Kinematics

The thigh bone is connected to knee bone....
Why is this so useful?

- Affected by our day to day
- Essential for understanding of overuse injuries
- Implicated in other injuries
  - ACL in females
  - Concussions
  - Back pain
  - Hip pain
Implications of Appropriate Biomechanics

• Meta analysis on Neuromuscular Education for ACL prevention
  – 6 RCT and 8 cohorts total of 27,000 patients
  – Decreased incidence of ACL by 50 %
• Meta analysis Low Back pain in Children and Adolescents (PT and manual therapy)
  – 11 studies
  – 334 patients (221 treatment, 113 control)
  – Clinical and Statistical improvement in pain and QOL scores
Biomechanics in throwing injuries

- Weak serratus anterior
- Scapular dyskinesis
  - Winging
  - Depression
  - Protraction
- Weakness in core

Implications of Appropriate Biomechanics

- Throwing injury prevention
  - Mechanics
  - Throwing restrictions
- Overuse injuries
- Better performance
If all else fails

TO EKG or not to EKG or Cardiac MRI?
HB 1319

- Mandatory EKG
  - One time before 1st year of participation
  - 2nd before students 3rd year
  - PPE

- UIL Legislation
  - PPE mandatory
  - EKG and Echocardiogram recommended not mandatory
  - Awareness form

Sudden Death Athletes

- Rare event

- Sudden cardiac death is the leading cause amongst young athlete

- Exercise is trigger for SCD in athletes
TABLE 2. CAUSES OF SUDDEN DEATH IN ATHLETES AND NONATHLETES 35 YEARS OF AGE OR LESS IN THE VENETO REGION OF ITALY, 1978 TO 1996.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Athletes (N=40)</th>
<th>Nonathletes (N=200)</th>
<th>TOTAL (N=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomalous right ventricular</td>
<td>11 (22.4)</td>
<td>18 (9.2)*</td>
<td>29 (10.8)</td>
</tr>
<tr>
<td>cardiomyopathy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atherosclerotic coronary</td>
<td>9 (18.8)</td>
<td>36 (18.6)</td>
<td>45 (16.7)</td>
</tr>
<tr>
<td>artery disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anomalous origin of coronary</td>
<td>6 (12.2)</td>
<td>1 (0.5)†</td>
<td>7 (2.6)</td>
</tr>
<tr>
<td>artery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease of conduction system</td>
<td>4 (8.2)</td>
<td>20 (9.1)</td>
<td>24 (8.9)</td>
</tr>
<tr>
<td>Mitral valve prolapse</td>
<td>3 (6.1)</td>
<td>19 (9.5)</td>
<td>22 (8.2)</td>
</tr>
<tr>
<td>Hypertrophic cardiomyopathy</td>
<td>1 (2.0)</td>
<td>16 (7.3)</td>
<td>17 (6.3)</td>
</tr>
<tr>
<td>Myocarditis</td>
<td>3 (6.1)</td>
<td>19 (9.6)</td>
<td>22 (8.2)</td>
</tr>
<tr>
<td>Myocardial bridge</td>
<td>2 (4.1)</td>
<td>5 (2.5)</td>
<td>7 (2.6)</td>
</tr>
<tr>
<td>Pulmonary hypertension</td>
<td>1 (2.0)</td>
<td>3 (1.5)</td>
<td>4 (1.5)</td>
</tr>
<tr>
<td>Dissecting aortic aneurysm</td>
<td>1 (2.0)</td>
<td>11 (5.5)</td>
<td>12 (4.5)</td>
</tr>
<tr>
<td>Dilated cardiomyopathy</td>
<td>1 (2.0)</td>
<td>9 (4.5)</td>
<td>10 (4.7)</td>
</tr>
<tr>
<td>Other</td>
<td>5 (10.2)</td>
<td>63 (31.7)</td>
<td>68 (26.5)</td>
</tr>
</tbody>
</table>

*P<0.001 for the comparison with the athletes.
†P<0.001 for the comparison with the athletes.
Corrado 49 athletes

Sudden Cardiac Deaths

- ARRVD: 23%
- CAD: 19%
- ACA: 12%
- MVP: 10%
- HCM: 2%
- Myocarditis: 6%
- Myocardial Bridge: 4%
- Conduction: 8%
- Other: 10%
- DCM: 2%
- DAA: 2%
- PE: 2%
- Other: 10%

During the study period, the annual incidence of sudden cardiovascular death decreased by 89% in screened athletes (P for trend <.001). In contrast, the incidence rate of sudden cardiovascular death did not demonstrate consistent changes over time in unscreened nonathletes.
Ongoing Studies

- EKG in Athletes
  - Fewer FP than HP and PE
  - Cost effective
  - Recognized HR conditions
- Cardiac MRI
  - School age children
  - Recognized HR-CVC that even EKG missed
  - Increased number of individuals with ACA

AHA

Circulation

Recommendations and Considerations Related to Preparticipation Screening for Cardiovascular Abnormalities in Competitive Athletes: 2007 Update: A Scientific Statement From the American Heart Association Council on Nutrition, Physical Activity, and Metabolism: Endorsed by the American College of Cardiology Foundation
Barry J. Maron, Paul D. Thompson, Michael J. Ackerman, Gary Balady, Stuart Berger, David Cohen, Robert Dineff, Pamela S. Douglas, David W. Glover, Adolph M. Hutter, Jr, Michael D. Krauss, Martin S. Maron, Matthew J. Mitten, William O. Roberts and James C. Puffer

Circulation. 2007;115:1643-1655; originally published online March 12, 2007; doi: 10.1161/CIRCULATIONAHA.107.181423
Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75331
Copyright © 2007 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539
Role of Team Physician

Role of team physician

- Leadership
- Provision of medical care
  - Individual
  - Mass events
- Prevention
- Integration of services
  - Athletic care network
- RTP
Being a Team Physician

• Improve the care of adolescent and pediatric athlete participating in Sports
  – MSK conditions
  – Medical
  – Psychological
  – Administrative
  – Ethical
  – Medico/Legal

Role of Team Physician

• Challenging Environment
  – NO $$$$$$
  – High Risk Population
  – Health care evolution
Role of Team Physician

- Provide PPE
- Prevention
  - Injuries
  - High risk Medical conditions
- Navigation of Health Care system
  - Provide imaging
  - Specialist care

Pre-Participation Sports Physical
Primary Goals

• Detect medical conditions
  – present a risk of injury
  – disease
  – death to an athlete or opponent
• Injuries in Particular
  – When did it happen
  – Evaluated?
  – Management
  – Cleared

Primary Goals

• Detect Medical Conditions
  – Undiagnosed
  – Misdiagnosed medical conditions
Primary Goals

• Detect medical conditions
  – That need further evaluation
  – Rehabilitation prior to participation

Primary Goals

• Guidance for participation
• Patients with known conditions
Primary Goals

- Meet legal and insurance obligations

Secondary Goals

- Counsel health related issues
- Assess fitness level
- Injury prevention and treatment
- Determine general health
Pre-participation Sports Evaluation
Take Advantage of it!

• 85% of those athletes who get a PSE will not return for a health maintenance visit.

“Bad news. Your arm is too injured to hold up those sneakers you endorse on TV.”

Take advantage!!

• Female Athlete triad
  – Disordered eating
    • Poor energy
  – Low Bone Density
    • Osteopenia
  – Irregular Menses
    • Menstrual Dysfunction
Take Advantage!!

- Substance Abuse
- Illicit Drugs

Quick Tips...

- Go over questions
- Our patients
  - Rarely see doctors
  - High risk environments
  - All they want is to get cleared
  - Focus on most important conditions
- Legally your name on the paper
Not all Kids are Destined to be these guys!

Early Sports Specialization
Do Genetics Play a Role?

- Very limited data
- Over 200 autosomal gene variants and loci associated with physical performance
- Preferable genotypes are uncommon AND combinations are even more rare
- Chances of a “perfect” sports genotype are 1 in 20 million

Early Sports Specialization

- “Professional Pie”
- 0.2 to 0.5% percent of High School athletes go PRO
  - Higher risk of overuse
  - Higher risk of burnout
  - Isolation?
- Young athletes who participate in multiple sports have lower risk of injury
2004 Olympians

<table>
<thead>
<tr>
<th>Sport</th>
<th>Age Began Sport</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>T &amp; F</td>
<td>14.0</td>
<td>387</td>
</tr>
<tr>
<td>Wrestling</td>
<td>11.2</td>
<td>248</td>
</tr>
<tr>
<td>Basketball</td>
<td>11.1</td>
<td>89</td>
</tr>
<tr>
<td>Hockey</td>
<td>8.9</td>
<td>167</td>
</tr>
<tr>
<td>Rowing</td>
<td>15.4</td>
<td>283</td>
</tr>
<tr>
<td>Volleyball</td>
<td>8.1</td>
<td>226</td>
</tr>
<tr>
<td>BB/SB</td>
<td>10.4</td>
<td>98</td>
</tr>
<tr>
<td>Swimming</td>
<td>13.8</td>
<td>125</td>
</tr>
</tbody>
</table>

Age of onset of training was **NEGATIVELY** correlated with time lag before competing in an international championship.

R = - 0.63 to -0.83 p< 0.01
German Olympic Athletes

German national athletes in all Olympic sports (N = 1558)
• Older age of initiating training in main sport compared to those who did achieve international level (11.4y vs. 10.2y)
• On average, participated in 2 other sports before or parallel to main sport.
• Internationally successful athletes continued in other sports to a later age.
• Adolescent success did not predict senior level success.

Sports Specialization

• Few Make it Pro
• Early Specialization
  – Success limited
  – Likely detrimental
• Encourage other Sports
• Early success does not mean later success
Bibliography

Team Physician Consensus Statement: 2013 update ACSM

Role of Primary Care Sports Medicine AMSSM


Brenner et al. AAP position Statement Overuse Injuries, Overtraining, and Burnout in Child and Adolescent Athletes 2007