

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

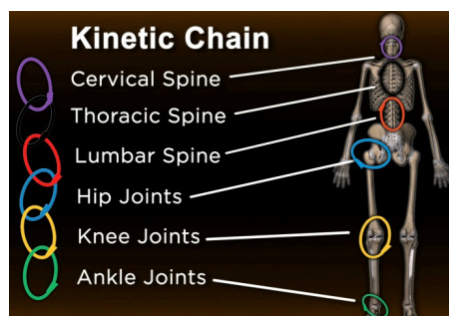


Primary Care Sports Medicine

- Special Populations
 - Youth
 - Geriatric
 - Disabled
 - Pregnancy



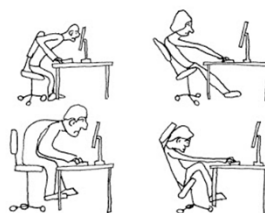
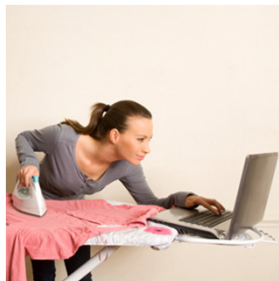
Biomechanics and Kinematics



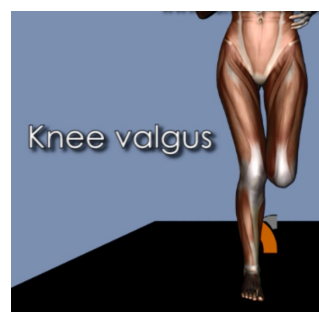
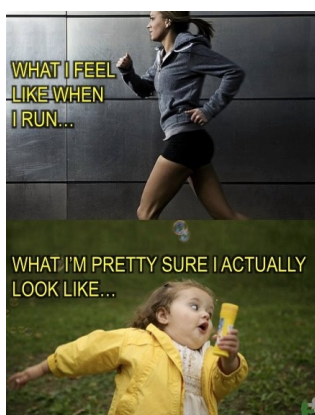
The thigh bone is connected to knee bone....

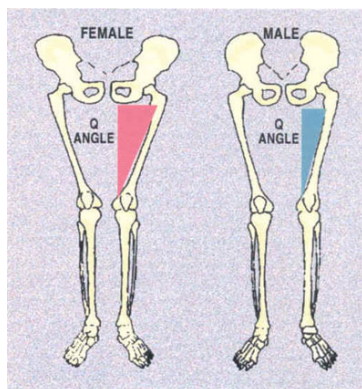
Why is this so useful?

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



BAD POSTURE (EXAMPLES OF)





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



LEE STILL WINLESS, BUT PHILLIES POUND METS, 10-6 **SPORTS**

The Philadelphia Inquirer philly.com

Thursday, May 31, 2012 • 2012 Pulitzer Prize Winner • \$1

Unions, parents to protest SRC plan

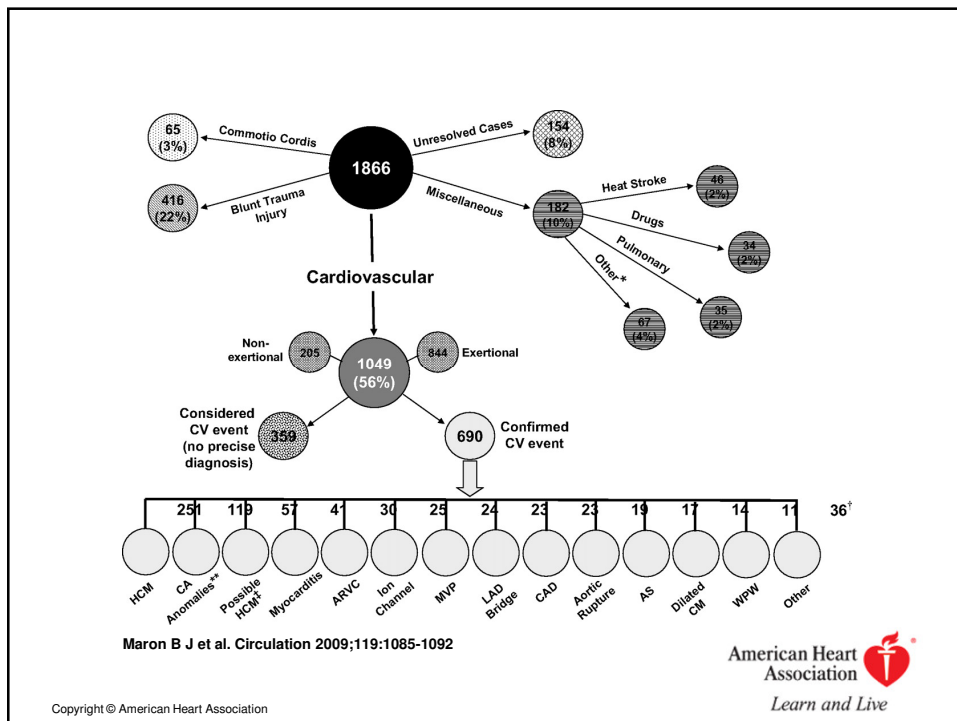
The \$2.5 billion budget shortfalls... the SRC should fight for more funding.

Signing bill for student safety

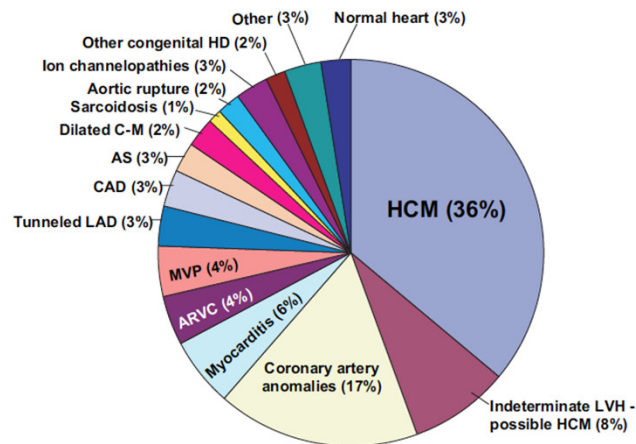
50 years for war crimes in Africa

In a landmark case, former Liberian leader Charles G. Taylor was sentenced for atrocities in Sierra Leone.

10 Athletes Whose Lives Were Cut Too Short



SCD in USA



Corrado NEJM

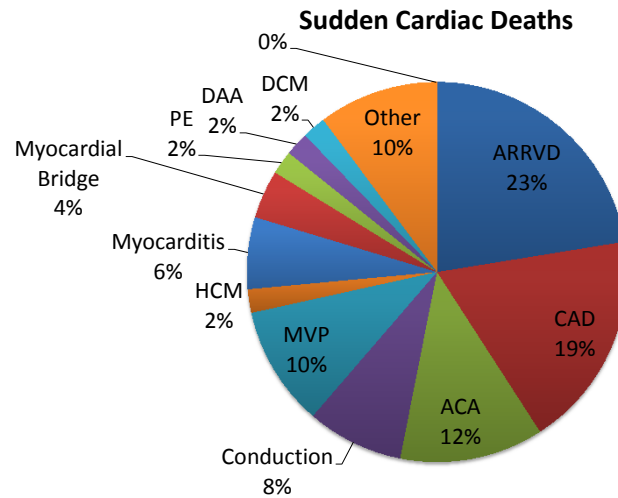
TABLE 2. CAUSES OF SUDDEN DEATH IN ATHLETES AND NONATHLETES 35 YEARS OF AGE OR LESS IN THE VENETO REGION OF ITALY, 1979 TO 1996.

CAUSE	ATHLETES (N=49)	NONATHLETES (N=220)	TOTAL (N=269)
	number (percent)		
Arrhythmogenic right ventricular cardiomyopathy	11 (22.4)	18 (8.2)*	29 (10.8)
Atherosclerotic coronary artery disease	9 (18.4)	36 (16.4)	45 (16.7)
Anomalous origin of coronary artery	6 (12.2)	1 (0.5)†	7 (2.6)
Disease of conduction system	4 (8.2)	20 (9.1)	24 (8.9)
Mitral-valve prolapse	5 (10.2)	21 (9.5)	26 (9.7)
Hypertrophic cardiomyopathy	1 (2.0)	16 (7.3)	17 (6.3)
Myocarditis	3 (6.1)	19 (8.6)	22 (8.2)
Myocardial bridge	2 (4.1)	5 (2.3)	7 (2.6)
Pulmonary thromboembolism	1 (2.0)	3 (1.4)	4 (1.5)
Dissecting aortic aneurysm	1 (2.0)	11 (5.0)	12 (4.5)
Dilated cardiomyopathy	1 (2.0)	9 (4.1)	10 (3.7)
Other	5 (10.2)	61 (27.7)	66 (24.5)

*P=0.008 for the comparison with the athletes.

†P<0.001 for the comparison with the athletes.

Corrado 49 athletes



JN The JAMA Network

From: **Trends in Sudden Cardiovascular Death in Young Competitive Athletes After Implementation of a Preparticipation Screening Program**

JAMA. 2006;296(13):1593-1601. doi:10.1001/jama.296.13.1593

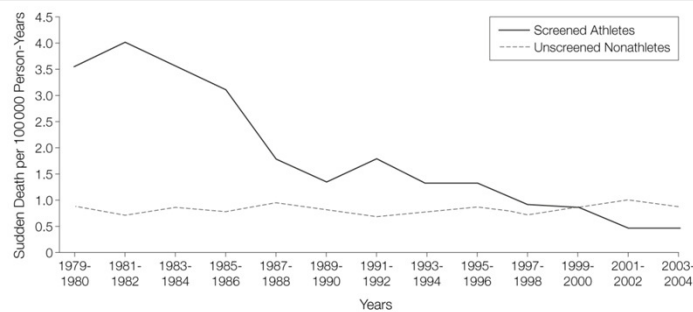


Figure Legend:

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.

Date of download: 5/8/2013

Copyright © 2012 American Medical Association. All rights reserved.

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
JOURNAL OF THE AMERICAN HEART ASSOCIATION



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 Dimeff, 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 75231
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

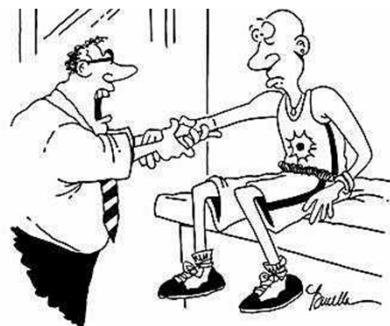
Secondary Goals

- 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...

Page 1 of 1

Sports Participation Physical Evaluation 6/13/14

History: Name Charles S. P. Jr. Date of Birth 6/13/14
 Grade 5 School Warrior Birthdate 6/13/14

Explain "Yes" answers below. Circle questions you don't know the answers to.

- Have you had a medical illness or injury since your last check-up or sports physical? ☐ Yes ☒ No
- Do you have an ongoing chronic illness? ☐ Yes ☒ No
- Have you ever been hospitalized overnight? ☐ Yes ☒ No
- Have you ever had surgery? ☐ Yes ☒ No
- Are you currently taking any prescription or non-prescription (over-the-counter) medications or pills or using an inhaler? ☐ Yes ☒ No
- Have you ever taken any supplements or vitamins to help you gain or lose weight or improve your performance? ☐ Yes ☒ No
- Do you have any allergies (for example, to pollen, mold, dust, or allergen inhalers)? ☐ Yes ☒ No
- Have you ever had a rash or hives develop during or after exercise? ☐ Yes ☒ No
- Have you ever passed out during or after exercise? ☐ Yes ☒ No
- Have you ever been dizzy during or after exercise? ☐ Yes ☒ No
- Have you ever had chest pain during or after exercise? ☐ Yes ☒ No
- Do you get tired more quickly than your friends do during exercise? ☐ Yes ☒ No
- Have you ever had racing of your heart or skipped heart beats? ☐ Yes ☒ No
- Have you had high blood pressure or high cholesterol? ☐ Yes ☒ No
- Have you ever been told you have a heart murmur? ☐ Yes ☒ No
- Has any family member or relative died of heart problems or sudden death before age 50? ☐ Yes ☒ No
- Have you had a severe chest infection (for example, pneumonia or tuberculosis) within the last month? ☐ Yes ☒ No
- Has a physician ever diagnosed or mentioned your participation sports for any heart problem? ☐ Yes ☒ No
- Do you have any current skin problems (for example, itching, rashes, acne, warts, ingrown, or blisters)? ☐ Yes ☒ No
- Have you ever had a head injury or concussion? ☐ Yes ☒ No
- Have you ever been knocked out, become unconscious, or lost your memory? ☐ Yes ☒ No
- Have you ever had a seizure? ☐ Yes ☒ No
- Do you have frequent or severe headaches? ☐ Yes ☒ No
- Have you ever had numbness or tingling in your arms, hands, legs, or feet? ☐ Yes ☒ No
- Have you ever had a single burn, or (scalded) scald? ☐ Yes ☒ No
- Have you ever become ill from exercising in the heat? ☐ Yes ☒ No
- Do you cough, wheeze, or have trouble breathing during or after activity? ☐ Yes ☒ No
- Do you have asthma? ☐ Yes ☒ No
- Do you have seasonal allergies that require medical treatment? ☐ Yes ☒ No

10. Do you use any special protective or corrective equipment or devices that aren't usually used for your sport or position (for example, knee brace, special neck roll, foot orthotics, wristbar on your wrist, hearing aid)? ☐ Yes ☒ No

11. Have you had any problems with your nose or sinuses? ☐ Yes ☒ No

12. Do you wear glasses, contacts, or protective eyewear? ☐ Yes ☒ No

Have you ever had a sprain, strain, or swelling after injury? ☐ Yes ☒ No

Have you broken or fractured any bones or dislocated any joint? ☐ Yes ☒ No

Have you had any other problems with pain or swelling in muscles, tendons, bones or joints? ☐ Yes ☒ No

Please, check appropriate (large) and explain below:

Head	Neck	Chest	Wrist
Shoulder	Elbow	Hand	Finger
Lower Arm			

13. If you want to weigh more or less than you do now? ☐ Yes ☒ No

14. Do you lose weight regularly to meet weight requirements? ☐ Yes ☒ No

15. Record the dates of your most recent immunizations (shot) below:

Measles	Polio
Whooping Cough	MMII
MMII	MMII
MMII	MMII
MMII	MMII
MMII	MMII

16. When was your first menstrual period? ☐ Yes ☒ No

When was your most recent menstrual period? ☐ Yes ☒ No

How many months do you usually have from the start of one shot of a shot? ☐ Yes ☒ No

How many periods have you had in the last year? ☐ Yes ☒ No

What was the longest time between periods in the last year? ☐ Yes ☒ No

Explain "Yes" answers here:

NO
I'm
A
WARRIOR

I hereby state that, to the best of my knowledge, my answers to the above questions are complete and correct.

Signature of athlete Charles S. P. Jr. Signature of parent/guardian Charles S. P. Jr. Date 6/13/14

Reviewed by: (Initial) Date

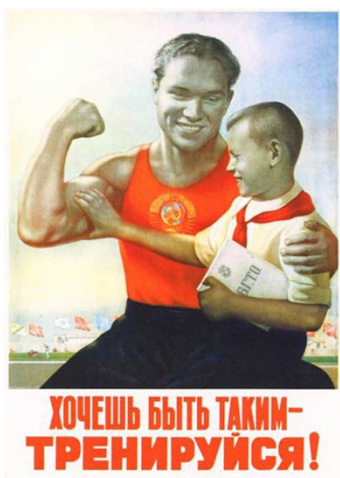
Approved for Participation: Doctor, Nurse, Athletic Trainer, or School Nurse. Approved for Release: Parent/Guardian. Approved for Release: Student.

- 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



Sport	Age Began Sport	N
• T & F	14.0	387
• Wrestling	11.2	248
• Basketball	11.1	89
• Hockey	8.9	167
• Rowing	15.4	283
• Volleyball	8.1	226
• BB/SB	10.4	98
• Swimming	13.8	125

2004 Olympians

- 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

Maron B, **Sudden Deaths in Young Competitive Athletes Analysis of 1866 Deaths in the United States, 1980–2006** *Circulation*, 2009 1085-1092

DiFiori J, et al. **Overuse Injuries and Burnout in Youth Sports: A Position Statement from the American Medical Society for Sports Medicine** *Clin J Sport Med* 2014;24:3–20

Calvo-Muñoz I et al **Physical therapy treatments for low back pain in children and adolescents: a meta-analysis.** *BMC Musculoskelet Disord* 2013 Feb 2;14:55. doi: 10.1186/1471-2474-14-55.

Joel J. Gagnier, et al **Interventions Designed to Prevent Anterior Cruciate Ligament Injuries in Adolescents and Adults A Systematic Review and Meta-analysis** *AM J of Sports Medicine* 2012 Sep 12.

Fleisig GS, Andrews JR **Prevention of elbow injuries in youth baseball pitchers.** *Curr Sports Med Rep.* 2009;8(5):250–254pmid:19741352

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

Vaeyens R, Güllich A, Warr CR, Philippaerts R. **Talent identification and promotion programmes of Olympic athletes.** *J Sports Sci.* 2009 Nov;27(13):1367-80.