

# Preparticipation Physical Exam

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# Disclosures

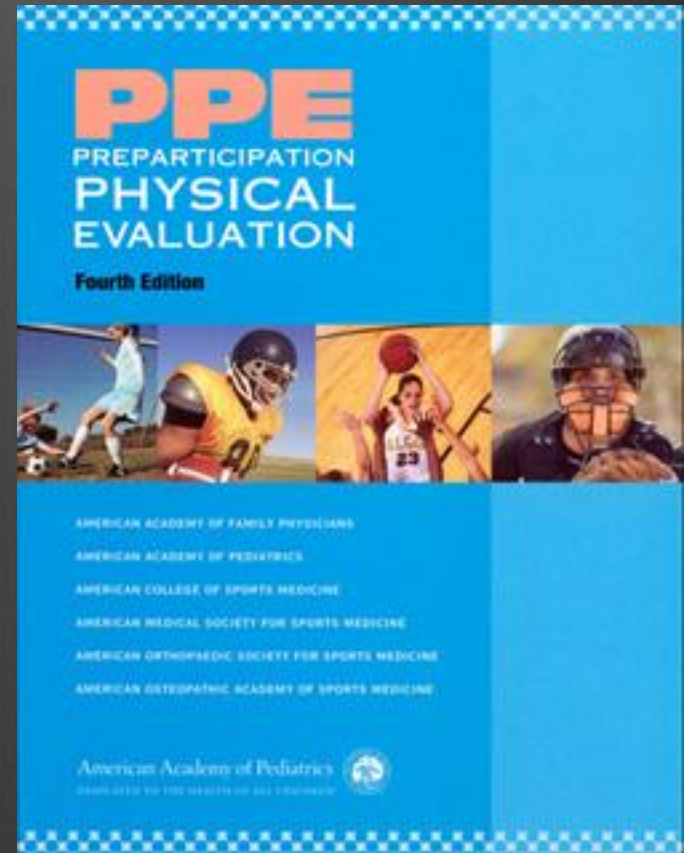
⊗ No Disclosures

# Objectives

- ⊗ Be able to determine contraindications to participating in competitive sporting events
- ⊗ Become familiar with cardiovascular screening guidelines
- ⊗ Be able to determine when further cardiovascular work up is needed

# Preparticipation Physical Exam

- ⦿ Overview
  - ⦿ Currently in its Fourth edition
  - ⦿ First published in 1992
  - ⦿ Endorsed by AAFP, AAP, ACSM, AMSSM, AOSSM, AOASM



# Preparticipation Physical Exam

## ⊗ Goals

⊗ “The most important goal of the PPE is to promote the health and safety of athletes”

## ⊗ Primary Objective

⊗ Screen for potentially life-threatening or disabling conditions

⊗ Screen for conditions that may predispose the athlete to injury or illness

## ⊗ Secondary Objective

⊗ Determine general health of the athlete

⊗ Serve as an entry point into the healthcare system

⊗ Provide an opportunity to discuss health-related topics with athlete

# Timing/Frequency

- ⊗ AHA recommends every two years with an interim history and focused exam
- ⊗ PPE consensus panel:
  - ⊗ Every 2 yrs in younger athletes, every 2-3 years in older athletes
  - ⊗ Annual updates
- ⊗ Dictated by governing bodies

# Timing/Frequency

- ⊗ UIL of Texas

- ⊗ Section 1205: ATHLETIC ELIGIBILITY

- ⊗ (1) Pre-participation Physical Examination . Upon entering the first and third years of high school, a physical examination signed by a physician, a physician assistant licensed by a State Board of Physician Assistant Examiners, a registered nurse recognized as an advanced practice nurse by the Board of Nurse Examiners or a doctor of chiropractic is required. Standardized pre-participation physical examination forms, available from the League office and authorized by the UIL Medical Advisory Committee, are required.
    - ⊗ (2) Medical History Form . Each year prior to any practice or participation a UIL medical history form signed by both student and a parent or guardian is required. A medical history form shall accompany each physical examination and shall be signed by both student and a parent or guardian.

# Preparticipation Physical Exam

- ⊗ Exam Content
  - ⊗ History/Questionnaire
    - ⊗ cardiovascular history, concussion/neuro, prior musculoskeletal injury, illness, medical conditions
  - ⊗ Vital signs
    - ⊗ Ht/Wt
    - ⊗ BP and Visual Acuity
  - ⊗ Cardiovascular exam
  - ⊗ Pulmonary exam
  - ⊗ Abdominal/GU exam
  - ⊗ Skin exam
  - ⊗ Musculoskeletal exam



# Preparticipation Physical Exam

- ⊗ Vital signs
  - ⊗ “Blood pressure measurement and testing of visual acuity are essential”
  - ⊗ Note: Pediatric BP guidelines are based on height and age
  - ⊗ Considered functionally one-eyed if best corrected acuity in one eye is less than 20/40
    - ⊗ AAP/AAO recommend eye protection with polycarbonate or CR-39 lenses even for low risk sports
    - ⊗ Should be worn in moderate to high risk sports
    - ⊗ Mandatory for all functionally one-eyed athletes
      - ⊗ Participation in sports where eye protection can't be effectively worn is contraindicated

**Box 6C-3. Categories of Sports-Related Eye Injury Risk to the Unprotected Player<sup>a</sup>**

<p><b>High Risk</b></p>	<p><i>Small, fast projectiles</i>          Air rifle          BB gun          Paintball</p> <p><i>Hard projectiles, "sticks," close contact</i>          Baseball/softball          Basketball          Cricket          Fencing          Hockey (field and ice)          Lacrosse (men's and women's)          Racquetball          Squash</p> <p><i>Intentional injury</i>          Boxing          Full-contact martial arts</p>
<p><b>Moderate Risk</b></p>	<p>Badminton          Fishing          Football          Golf          Soccer          Tennis          Volleyball          Water polo</p>
<p><b>Low Risk</b></p>	<p>Bicycling          Diving          Noncontact martial arts          Skiing (snow and water)          Swimming          Wrestling</p>
<p><b>Eye Safe</b></p>	<p>Gymnastics          Track and field<sup>b</sup></p>

TABLE 6C-2. RECOMMENDED EYE PROTECTORS FOR SELECTED SPORTS<sup>a</sup>

Sport	Minimal Eye Protector	Comment
Baseball/softball (youth batter and base runner)	ASTM standard F910	Face guard attached to helmet
Baseball/softball (fielder)	ASTM standard F803 for baseball	ASTM specifies age ranges
Basketball	ASTM standard F803 for basketball	ASTM specifies age ranges
Bicycling	Helmet plus street-wear/fashion eyewear	
Boxing	None available; not permitted in the sport	Contraindicated for functionally one-eyed athletes
Fencing	Protector with neck bib	
Field hockey (men and women)	ASTM standard F803 for women's lacrosse (goalie: full face mask)	Protectors that pass for women's lacrosse also pass for field hockey
Football	Polycarbonate eye shield attached to helmet-mounted wire face mask	
Full-contact martial arts	None available; not permitted in the sport	Contraindicated for functionally one-eyed athletes
Ice hockey	ASTM standard F513 face mask on helmet (goaltenders: ASTM standard F1587)	HECC OR CSA certified full face shield
Lacrosse (men)	Face mask attached to lacrosse helmet	
Lacrosse (women)	ASTM standard F803 for women's lacrosse	Should have option to wear helmet
Paintball	ASTM standard F1776 for paintball	
Racquet sports (badminton, tennis, paddle tennis, handball, squash, and racquetball)	ASTM standard F803 for selected sport	
Soccer	ASTM standard F803 for selected sport	
Street hockey	ASTM standard 513 face mask on helmet	Must be HECC or CSA certified
Track and field	Street-wear with polycarbonate lenses/fashion eyewear <sup>b</sup>	
Water polo/swimming	Swim goggles with polycarbonate lenses	
Wrestling	No standard available	Custom protective eyewear can be made

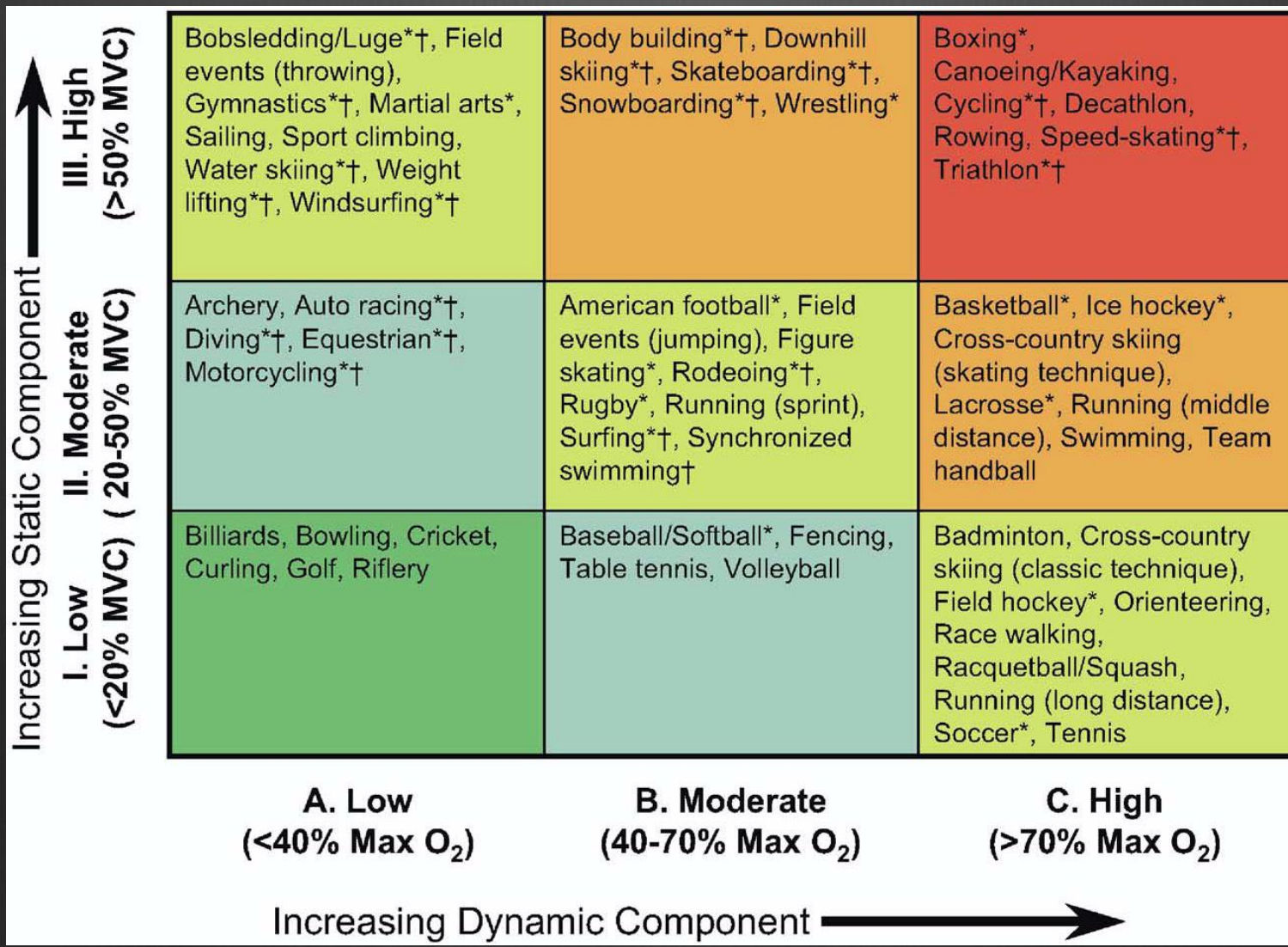
Abbreviations: ASTM, American Society for Testing and Materials; CSA, Canadian Standards Association; HECC, Hockey Equipment Certification Council.

<sup>a</sup>Adapted with permission from Vinger PF. A practical guide for sports eye protection. *Phys Sportsmed.* 2000;28(6):49-69.

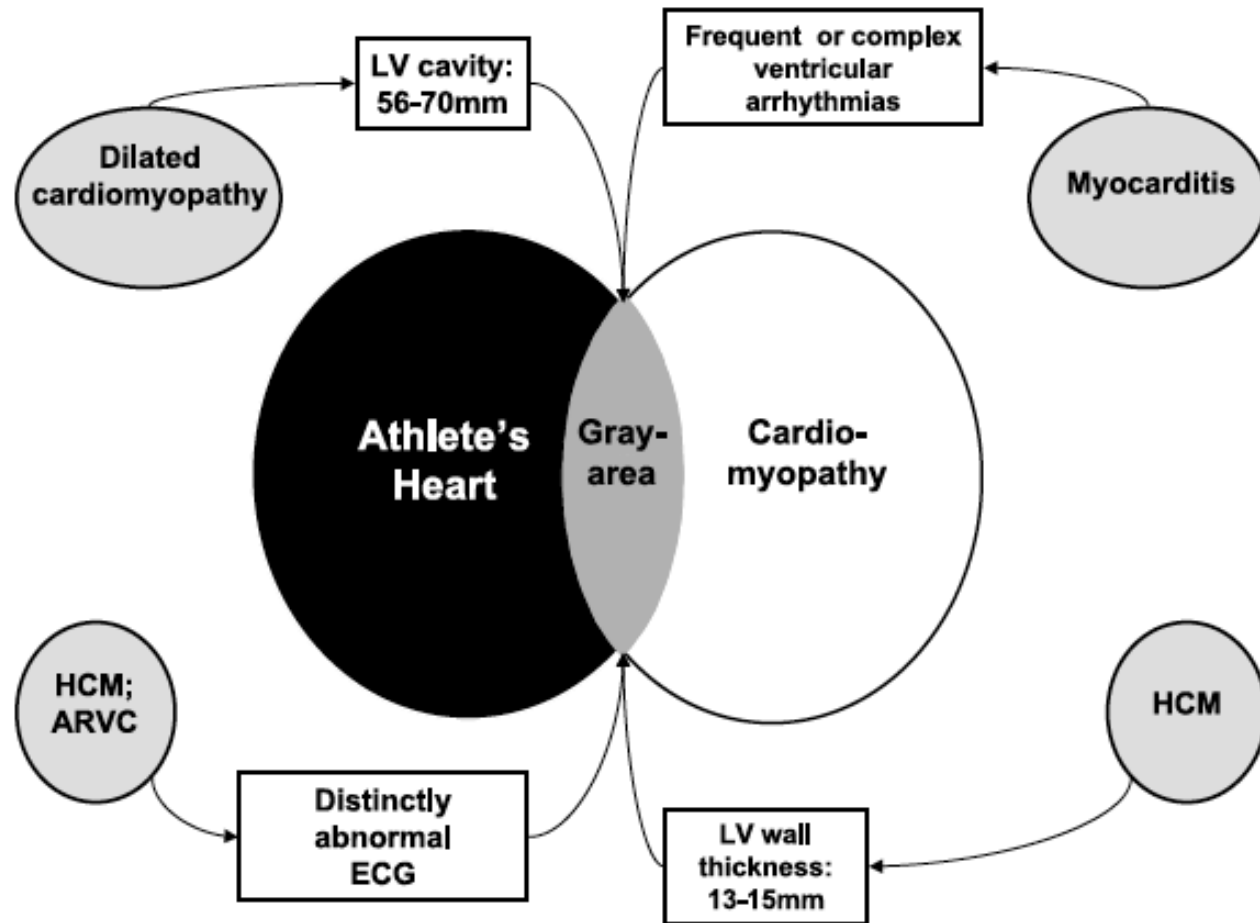
<sup>b</sup>Eyewear that passes ASTM standard F803 is safer than street-wear eyewear for all sports activities with impact potential.

# Preparticipation Physical Exam

- ⊗ Cardiovascular Exam
  - ⊗ Auscultation of heart in 2 positions
    - ⊗ Standing position preferred over sitting
  - ⊗ Palpation of femoral pulses
  - ⊗ Observe for any physical stigmata of Marfan Syndrome
  - ⊗ Contraindications for participation
    - ⊗ HCM murmur
      - ⊗ Very rare
      - ⊗ Increases with valsalva/standing
    - ⊗ Diastolic Murmurs
    - ⊗ Systolic Murmurs grade 4 and above
    - ⊗ Implantable cardioverter-defibrillator
    - ⊗ +History on questionnaire



# To EKG or not to EKG



# To EKG or not to EKG

- ⊗ Growing debate as to whether to include screening EKGs as part of the PPE
- ⊗ Standard practice in Europe
  - ⊗ Endorsed by the International Olympic Committee, European Society of Cardiology
- ⊗ American Heart Association 2007 revised guidelines advised against routine screening with EKG
  - ⊗ Poor sensitivity
  - ⊗ High false-positive rate
  - ⊗ Not cost effective
- ⊗ Currently, the AHA guidelines have been adopted for non-professional athletics

**Table 1.** AHA Consensus Panel Recommendations for Preparticipation Athletic Screening (1)

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Family History

1. Premature sudden cardiac death
2. Heart disease in surviving relatives less than 50 years old

Personal History

3. Heart murmur
4. Systemic hypertension
5. Fatigue
6. Syncope/near-syncope
7. Excessive/unexplained exertional dyspnea
8. Exertional chest pain

Physical Examination

9. Heart murmur (supine/standing\*)
  10. Femoral arterial pulses (to exclude coarctation of aorta)
  11. Stigmata of Marfan syndrome
  12. Brachial blood pressure measurement (sitting)
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\*In particular, to identify heart murmur consistent with dynamic obstruction to left ventricular outflow. From Maron BJ, et al. *Circulation* 1996;94:850–6, reprinted with permission of the American Heart Association.



# Preparticipation Physical Exam

## ⊗ Respiratory

- ⊗ Auscultation for wheezing/other abnormalities
- ⊗ Contraindications for participation
  - ⊗ Severe uncontrolled asthma
  - ⊗ Febrile respiratory illness

## ⊗ Gastrointestinal/Genitourinary

- ⊗ Palpate for masses, tenderness, organomegally
  - ⊗ Asymptomatic hernias are not contraindications for participation
- ⊗ Testicular exam
- ⊗ “The inguinal canal should be digitally palpated if the athlete is symptomatic and need not be if asymptomatic”

**TABLE 6E-1. GASTROINTESTINAL/GENITOURINARY MEDICAL CONDITIONS AND SPORTS PARTICIPATION**

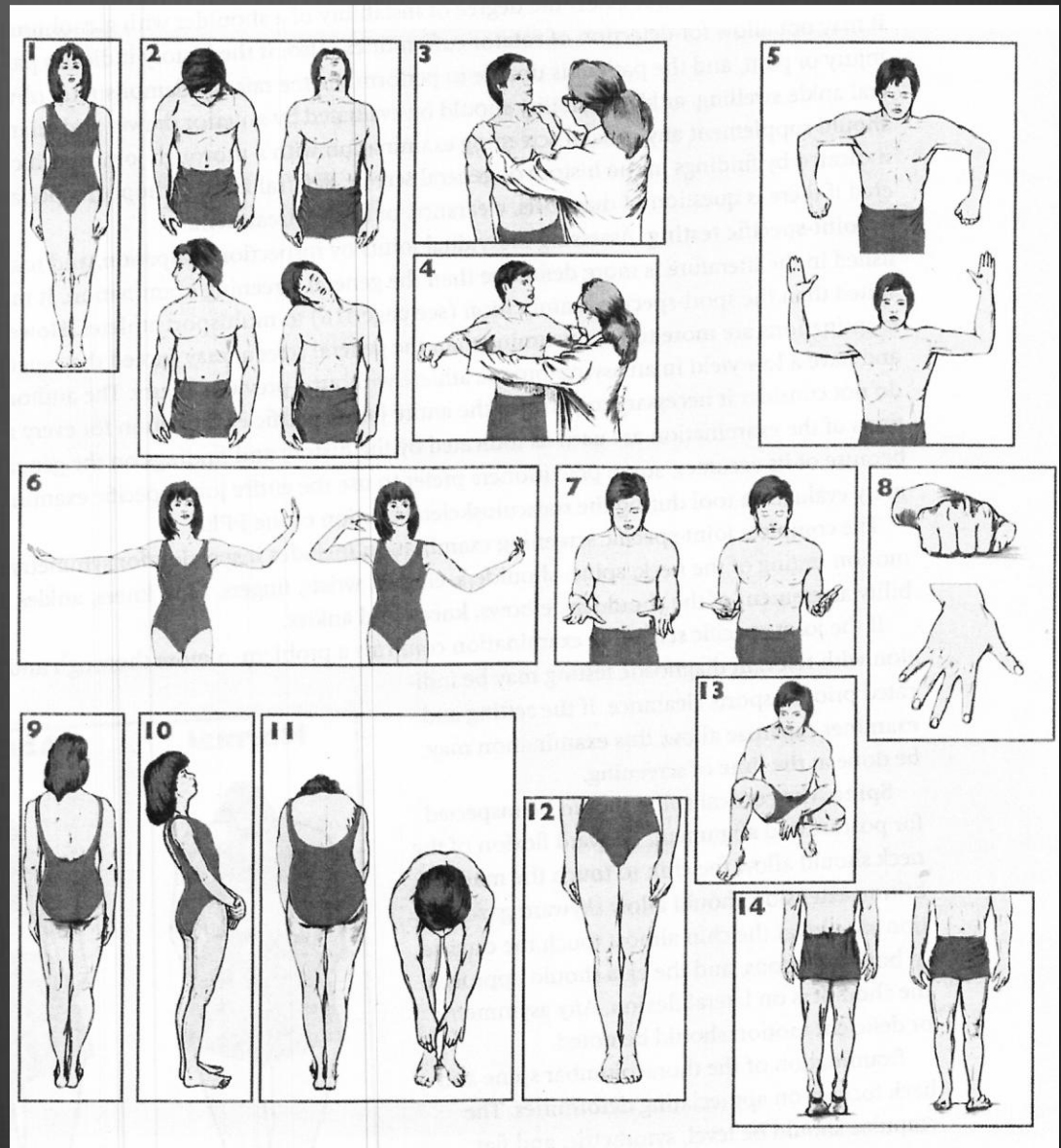
<b>Condition</b>	<b>May Participate</b>
<p><b>Diarrhea, infectious</b>  <i>Explanation:</i> Unless symptoms are mild and athlete is fully hydrated, no participation is permitted, because diarrhea may increase risk of dehydration and heat illness (see fever in Table 5-1).</p>	Qualified no
<p><b>Gastrointestinal</b>                      Malabsorption syndromes (celiac disease, cystic fibrosis)  <i>Explanation:</i> Athlete needs individual assessment for general malnutrition or specific deficits resulting in coagulation or other defects; with appropriate treatment, these deficits can be adequately treated to permit normal activities.                      Short bowel syndrome or other disorders requiring specialized nutritional support including parenteral or enteral nutrition  <i>Explanation:</i> Athlete needs individual assessment for collision, contact, or limited-contact sports. Presence of a central or peripheral indwelling venous catheter may require special considerations for activities and emergency preparedness for unexpected trauma to the device(s).</p>	Qualified yes
<p><b>Kidney, absence of one</b>  <i>Explanation:</i> Athlete needs individual assessment for contact, collision, and limited-contact sports. Protective equipment may reduce risk of injury to the remaining kidney sufficiently to allow participation in most sports, providing such equipment remains in place during activity.</p>	Qualified yes
<p><b>Liver and/or spleen, enlarged</b>  <i>Explanation:</i> If the liver or spleen is acutely enlarged, participation should be avoided because of risk of rupture. If the liver or spleen is chronically enlarged, individual assessment is needed before collision, contact, or limited-contact sports are played. Patients with chronic liver disease may have changes in liver function that may affect stamina, mental status, coagulation, or nutritional status.</p>	Qualified yes
<p><b>Ovary, absence of one</b>  <i>Explanation:</i> Risk of severe injury to the remaining ovary is minimal.</p>	Yes
<p><b>Testicle, undescended or absence of one</b>  <i>Explanation:</i> Certain sports may require a protective cup.</p>	Yes

# Preparticipation Physical Exam

## ⊗ Dermatologic

- ⊗ Inspect exposed areas of skin for common infectious conditions
  - ⊗ Herpes, Tinea, Folliculitis
- ⊗ Common reason for **temporary** disqualification from participation in sporting events
  - ⊗ Herpes-no systemic symptoms, no new lesions for 72hrs and 120hrs of therapy
  - ⊗ Tinea
    - ⊗ Corporis-72 hrs of therapy
    - ⊗ Capitis-2wks of oral therapy
  - ⊗ Bacterial infections- no new lesions for 48hrs, no drainage or moist lesions, 72hrs of therapy

- ⊗ Musculoskeletal screening exam
- ⊗ Focused exam if warranted
- ⊗ Clearance for participation in sports must be individualized



# Preparticipation Physical Exam

- ⊗ Neurological
  - ⊗ Focused exam should follow if athlete states has history of concussion, stingers, transient neurapraxia and/or is currently symptomatic
  - ⊗ Contraindications for participation
    - ⊗ Symptomatic concussions or failure to progress through protocol
    - ⊗ Repeated stingers (relative)

# Neurological

- ⊗ Transient neurapraxia
  - ⊗ Some controversy over exact guidelines for return to play
  - ⊗ “...It would be well-advised to seek neurological consultation”

TABLE 6B-1. GUIDELINES FOR RETURN TO PLAY AFTER TRANSIENT CERVICAL CORD NEURAPRAXIA

	Torg et al <sup>53</sup>	Cantu and Cantu <sup>54</sup>
<b>No restriction</b>	<ol style="list-style-type: none"> <li>1. No history of CCN and spinal canal-vertebral body ratio <math>\leq 0.8</math></li> </ol>	<ol style="list-style-type: none"> <li>1. One episode of TQ with full recovery and normal workup without functional spinal stenosis</li> </ol>
<b>Relative restriction</b>	<ol style="list-style-type: none"> <li>1. One episode of CCN and spinal canal-vertebral body ratio <math>\leq 0.8</math></li> <li>2. One episode of CCN with intervertebral disc disease or degenerative changes</li> <li>3. One episode of CCN with MRI evidence of cord deformation</li> </ol>	<ol style="list-style-type: none"> <li>1. One episode of TQ as a result of minimal contact</li> <li>2. One episode of TQ and evidence of disc bulging or herniation without functional spinal stenosis</li> </ol>
<b>Absolute contraindication</b>	<ol style="list-style-type: none"> <li>1. CCN with ligamentous instability, neurologic symptoms &gt;36 hours, and/or more than one episode</li> <li>2. CCN and MRI evidence of cord defect or edema</li> </ol>	<ol style="list-style-type: none"> <li>1. TQ with functional spinal stenosis documented by myelography, CT, or MRI</li> <li>2. Any permanent neurologic injury, ligamentous instability, or spinal cord contusion following cervical spine trauma</li> </ol>

Abbreviations: CCN, cervical cord neurapraxia; CT, computed tomography; MRI, magnetic resonance imaging; TQ, transient quadriplegia.

# Neurological

- ⊗ Atlanto-axial instability
  - ⊗ Associated with Downs Syndrome
    - ⊗ 15% incidence
  - ⊗ Screening with flexion/extension films should be done at age 5-6
  - ⊗ Defined as greater than 4.5mm between the posterior aspect of the anterior arch of the atlas and the anterior aspect of the odontoid
    - ⊗ Normal is <2.5mm
  - ⊗ Certain sports are contraindicated
    - ⊗ Judo, gymnastics, diving, skiing/snowboarding, squat lifting, soccer, pentathlon

# Neurological

- ⊗ Seizures/Epilepsy
  - ⊗ New onset/uncontrolled vs. Controlled
  - ⊗ Only scuba diving and sky diving are contraindicated by International League Against Epilepsy
  - ⊗ Sports where seizure would lead to increase risk of harm to athlete or others should be prohibited



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