



<b>Body System:</b> <span style="color: red;">Neurologic</span>		
<b>Session Topic:</b> <span style="color: blue;">Concussion and Return to Play Guidelines</span>		
<b>Educational Format</b>		<b>Faculty Expertise Required</b>
<b>REQUIRED</b>	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
<b>OPTIONAL</b>	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>
<b>Professional Practice Gap</b>	<b>Learning Objective(s) that will close the gap and meet the need</b>	<b>Outcome Being Measured</b>
<ul style="list-style-type: none"> <li>• There exists a suboptimal familiarity with the ACSM guidelines for evaluating athletes to return to play.</li> <li>• Knowledge gaps regarding the immediate and delayed symptoms of concussion or mild traumatic brain injury and recommend testing/monitoring of the patient as necessary</li> <li>• Knowledge gaps regarding symptoms that can indicate a possible intracranial blood clot following a concussion</li> <li>• Knowledge gaps regarding guidelines allowing athletes to return to play following concussions and advise as necessary</li> <li>• Knowledge gaps regarding counseling patients on how to prevent initial or repeated concussions, and the importance of cognitive and physical rest</li> <li>• Family medicine, pediatric, and emergency medicine</li> </ul>	<ol style="list-style-type: none"> <li>1. Identify the immediate and delayed symptoms of concussion or mild traumatic brain injury and recommend appropriate testing or monitoring of the patient.</li> <li>2. Recognize when a concussion might have caused an intracranial blood clot and recommend additional testing, monitoring, and treatment.</li> <li>3. Advise athletes, parents and coaches on when an athlete is able to return to play following a concussion or mild traumatic brain injury.</li> <li>4. Develop comprehensive communication plans for school officials with recommendations for academic adjustments and monitoring.</li> </ol>	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.



providers receive inadequate training during residency to systematically diagnose and manage athletes with concussion		
<b>ACGME Core Competencies Addressed</b> (select all that apply)		
X	Medical Knowledge	Patient Care
X	Interpersonal and Communication Skills	Practice-Based Learning and Improvement
	Professionalism	Systems-Based Practice
<b>Faculty Instructional Goals</b>		
<p>Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.</p> <ul style="list-style-type: none"> <li>• Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy &amp; reference citations</li> <li>• Facilitate learner engagement during the session</li> <li>• Address related practice barriers to foster optimal patient management</li> <li>• Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the <u>References</u> section below are a good place to start <ul style="list-style-type: none"> <li>○ Visit <a href="http://www.aafp.org/journals">http://www.aafp.org/journals</a> for additional resources</li> <li>○ Visit <a href="http://familydoctor.org">http://familydoctor.org</a> for patient education and resources</li> </ul> </li> <li>• Provide case-based examples of utilizing evidence-based recommendations and guidelines for neurocognitive assessment, concussion diagnosis, and return to play; emphasizing the identification of <i>red flags</i> that indicate the need for further evaluation and/or referral</li> <li>• Provide specific strategies and resources to counsel patients, and parents of pediatric patients, regarding best practice recommendations for safe return to physical activity</li> <li>• Provide specific examples of free and commercially available pocket guides and mobile apps for concussion and neurocognitive assessment</li> <li>• Provide specific strategies and resources to counsel coaches, athletes, and parents about concussion management, second-impact syndrome, the importance of physical and cognitive rest, and return to play guidelines</li> </ul>		

**Needs Assessment**

There are more than 2.6 million children ages 19 and under are seen in emergency departments for injuries related to sports and recreation each year.<sup>1</sup> This includes sports, such as football and basketball, as well as activities, such as playing on a playground, scooter riding and trampolining.<sup>1</sup> An estimated 712,700 children ages 19 and under were seen in emergency departments for injuries related to football or basketball in 2013.<sup>2</sup> The most common types of



sport-related injuries among children are sprains (mostly ankle), muscle strains, bone or growth plate injuries, repetitive motion injuries and heat-related illness.<sup>3</sup> Concussion-specific statistics include:<sup>4</sup>

- 50% of "second impact syndrome" incidents - brain injury caused from a premature return to activity after suffering initial injury (concussion) - result in death.
- 15.8% of football players who sustain a concussion severe enough to cause loss of consciousness return to play the same day.
- High school athletes who have been concussed are three times more likely to suffer another concussion in the same season.

Concussions or “mild” brain injuries are common in the U.S. Every year, at least 1.7 million TBIs (both “mild” & “traumatic”) occur as an isolated injury or along with other injuries.<sup>5</sup> The incidence of sports-related concussion is estimated to be between 1.6 to 3.8 million annually, however, over 66% go unreported.<sup>6</sup> Some estimates suggest that approximately 2.5 concussions occur for every 10 thousand athletic exposures (i.e. participating in one game or practice).<sup>7</sup> Patients may present in the ambulatory setting complaining of headache, sleep disorders, or loss of consciousness days or weeks after the incident that caused the injury; or they may present to emergency or urgent care after an injury; or the physician could be serving as a sideline physician. More than 59% of employed family physicians provide urgent care, and 36% of family physicians hold hospital privileges to provide emergency department care.<sup>8,9</sup>

Data from the American Academy of Family Physicians (AAFP) 2012 CME Needs Assessment Survey indicates that family physicians have statistically significant gaps in knowledge and skill to provide optimal management of concussion/minimal brain injury, especially in the selection of appropriate imaging modalities; as well as return to play management.<sup>10</sup> More specifically, CME outcomes data from the 2012 AAFP Scientific Assembly (currently FMX): *Concussion and Minimal Brain Injury*, 2014 AAFP Assembly: *Concussions and Neurocognitive Assessment: The Headaches and Confusions*, and 2014 AAFP Assembly: *Return to Play Guidelines* sessions, suggest that physicians have knowledge and practice gaps with regard to diagnosing and managing concussion injuries; current evidence-based guidelines and recommendations for concussion management and return to play; having establish protocols for medical clearance, working with local schools; monitoring patient response to medication; developing care plans that are specific to the sport, and position played; compliance with concussion guidelines; appropriate screening and evaluation of patients who are concussed; and understanding of relevant legal aspects the use of a concussion pocket card and mobile apps for concussion assessment (e.g. SCAT3 for iPhone; and Android apps such as Concussion Recognition & Response, Concussion Awareness, Concussion Quick Check, Concussion Signs and Symptoms, Return2Play for Concussion from the University of Michigan, and patient education app like Kids Concussion Awareness); the need to educate patients about second-impact syndrome; if/when imaging is required, and the importance of cognitive rest.<sup>11,12</sup> . Over 30% of physician-learners from these sessions identified the need to pursue additional education on the topic. Learners specifically expressed a need to have training that addresses the role of the primary care physician in the office setting, in addition to training relevant within the context of providing care at the sideline.



A review of the literature further validates the need to provide an update and review of current evidence-based recommendations and guidelines for concussion diagnosis and management, as these recommendations are inconsistently translated into practice.<sup>13</sup> Physicians providing sideline care should not rely on self-reported symptoms, and should understand how to use neurocognitive assessment, understand their limitations and recognize when further testing or imaging is necessary.<sup>14-16</sup> While coaches and certified athletic trainers typically use physicians to make return-to-play decisions, there is an expressed need for targeted interventions, such as concussion education, improved parent/athlete education, increased “return to think” awareness, and more consistent use of sports concussion assessment tools.<sup>17</sup> Adherence to return-to-play guidelines by adolescent athletes is also suboptimal.<sup>18</sup> This is particularly true with regard to returning to learning, as most students look physically normal after a concussion.<sup>19-21</sup> Primary care providers inconsistently provide return to learn recommendations to school officials, who often fail to recognize the need for academic or environmental adjustments.<sup>19,22</sup> Additionally, some studies suggest that family medicine, pediatric, and emergency medicine providers receive inadequate training during residency to systematically diagnose and manage athletes with concussion.<sup>22-24</sup>

Family physicians should consider the following evidence-based recommendations:<sup>6,13,19-21,25-29</sup>

- Evaluation of a possible concussion should include a physical examination in addition to use of available concussion assessment tools.
- Imaging studies are sometimes used to rule out serious injuries, but are not indicated in the evaluation of uncomplicated concussion.
- Complete cognitive and physical rest are key components in the initial management of concussion.
- After concussion symptoms resolve, postural stability testing should be performed to ensure complete recovery.
- Concussion should be managed based on the individual patient, with a graded return-to-play protocol.
- After sustaining a concussion, athletes should not return to play until they have completely recovered.
- Medical treatment of concussion focuses on symptom management, including the same medications appropriate in patients without a concussion.
- Athletes should not return to play on the same day of sustaining a concussion.
- A more conservative approach, including a longer asymptomatic period before return to play, should be considered for the management of concussion in children.
- Protective gear has not been shown to reduce the incidence of concussion, but should be used to prevent other injuries.
- Because sport-related head and neck injuries share the same mechanism and often occur simultaneously, evaluation of athletes with head injuries should begin with an assessment of the neck.
- Football players with an abnormal neck examination after injury are presumed to have an unstable cervical spine and should be immobilized on a backboard with pads and helmet both on or both off.
- To assess concussion, the sideline physician should ask orientation questions that evaluate recently acquired memory.



- The Balance Error Scoring System should be used as part of the sideline evaluation to help detect concussion in athletes.
- Brief loss of consciousness does not correlate with severity or outcome of a sports-related concussion.
- Certain neuropsychological test batteries have been shown to reliably detect concussion in athletes. Although not particularly helpful to the sideline physician, these tests are used by professional and collegiate physicians, researchers, and those counseling players after severe or multiple concussions.
- Athletes should not return to play until all symptoms of concussion have cleared.
- Neuropsychological assessment is particularly valuable in patients with subtle deficits and is useful in treating patients with multiple sclerosis, Parkinson disease, traumatic brain injury, stroke, and human immunodeficiency virus encephalopathy.
- Neuropsychological assessment in patients with cognitive concerns is predictive in determining future motor vehicle crash risk, although assessment alone does not reduce this risk.
- Neuropsychological assessment is able to identify depression in patients with neurologic impairment, and monitor response to treatment.
- Neuropsychological assessment is valuable in diagnosing and following patients with concussion.
- Athletes, their families, and coaches should be counseled about risk factors for concussion by a licensed health care professional (LHCP) experienced in the diagnosis and management of sports concussions. Inexperienced LHCPs should be instructed in the administration of standardized validated sideline assessment tools, emphasizing that these tools are only a supplement to the evaluation of the athlete and should not be used alone to diagnose concussion.
- Recommend academic adjustments to school officials, including limiting course loads, shortened classes or school day, increased rest time, aids for learning (e.g. class notes or supplemental tutoring), and postponement of high-stakes testing (e.g. standardized state tests, Advance Placement Tests, or Scholastic Aptitude Test [SAT]).

Neuropsychological testing is highly sensitive to brain injury and can be helpful in the evaluation of concussion. Nonetheless, such testing is just one part of the multidisciplinary decision as to when a person is ready to return to work or sports. Although questions have been raised about its validity in predicting recovery, evidence exists that neuropsychological assessment is useful in predicting return to work or school, psychosocial outcomes, and community integration following concussion.<sup>27</sup> Physicians may want to consider an algorithmic approach to the patient with mild traumatic brain injury (concussion), and coordinate referral and follow-up care with a neuropsychologist for evaluation.<sup>27,30,31</sup>

Physicians should consider that athletes with learning disabilities (LD) or ADHD will have lower baseline neurocognitive scores compared to athletes without LD or ADHA, and should account for this in their assessment.<sup>32</sup> Additionally, sleep-deprived athletes reporting for baseline neurocognitive testing should be rescheduled for testing after a normal night's sleep, as low sleep quantity and quality may threaten the validity of the clinical measures.<sup>33</sup>



Team physicians are frequently asked to determine when an injured or ill athlete can return to practice or competition. Considerable guidance can be gleaned from the American College of Sports Medicine (ACSM), with whom the AAFP collaborated to develop return-to-play guidelines.<sup>34</sup> Such an evaluation includes many of the similar elements that are involved in Pre-Participation Exams (PPEs), including: a thorough medical history and physical exam, appropriate laboratory tests or screenings and a psychosocial assessment. Injured patients, however, require condition-specific screenings and exams (often involving certain imaging modalities), and the physician is typically required to provide detailed documentation of their status to the patient's family, coaches, athletic trainer(s) and other health care providers.<sup>34</sup> Because they serve as the optimal coordinator of patient care, family physicians are especially well-suited to communicate with a number of people involved in the patient's treatment. Family physicians need to be aware of the latest return-to-play guidelines and recommendations.

Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- Current concepts in concussion: evaluation and management<sup>6</sup>
- Cognitive rest in concussion management<sup>25</sup>
- Management of head and neck injuries by the sideline physician<sup>26</sup>
- AAN Guidelines: Evaluation and Management of Concussion in Athletes<sup>29</sup>
- Neuropsychological evaluation in primary care<sup>27</sup>
- Understanding Head Injuries: Improve the Lives of Your Patients with the AAFP's Concussion Resources<sup>35</sup>
- Simple tools to increase patient satisfaction with the referral process<sup>30</sup>
- Engaging Patients in Collaborative Care Plans<sup>31</sup>
- The Team Physician and the Return-to-Play Decision: A Consensus Statement<sup>34</sup>
- ACSM Return to Play – A Coach's Guide (handout for coaches)<sup>36</sup>
- CDC Traumatic Brain Injury<sup>5</sup>
- CDC Injury Prevention & Control: Traumatic Brain Injury: Reports & Fact Sheets<sup>37</sup>
- CDC Heads Up: Brain Injury in Your Practice<sup>38</sup>
- CDC A "Heads Up" on Managing Return to Play<sup>39</sup>
- FamilyDoctor.org. Concussion | Overview (patient resource)<sup>40</sup>

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