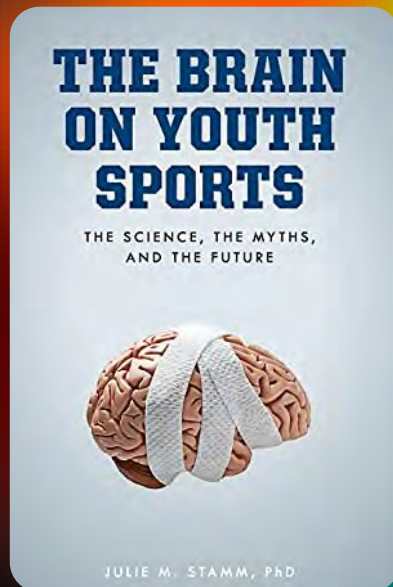


BIG IDEA 4



**COLLABORATION IS NECESSARY IN
PROMOTING BRAIN HEALTH AND CONCUSSION
PREVENTION.**

BIG IDEA 4



CONTEXT

Developments in the field of concussion research have spurred systemic changes at all levels of competitive sports. UW-Madison researchers are at the forefront of this work. BIOS learned from concussion scholars, pulling together insights for athletes and their support networks. We learned the science of brain health — including some socio-behavioral findings that contextualize advancements toward safer sports. Here, *in BIOS Volume 1*, we highlight several aspects of concussion research as well as the implications that these findings have for all who lead and compete in sports.

BRAIN SAFETY AND CONCUSSION PREVENTION: WHAT TO KNOW

- A player who experiences concussion symptoms should be removed from play immediately and should not return to play that day, even if their symptoms subside within 15 minutes.
- You don't have to lose consciousness to have a concussion. In fact, less than ten percent of concussions result in a loss of consciousness.
- Concussions can happen even if you don't hit your head. A blow to the body that causes the head and brain to move back and forth, like whiplash, can also cause a concussion.
- Continuing to play after sustaining a concussion can lead to prolonged symptoms and delayed recovery from that concussion.
- Returning to play too soon, before having recovered from a concussion, can increase the risk for sustaining a second concussion. It is important for athletes to be honest about their symptoms throughout the recovery process.
- Children and adolescents are at greater risk of having a prolonged recovery and worse outcomes following a concussion compared to adults. It is important to manage concussions more conservatively and provide adequate time for their developing brain to heal.
- Research suggests that children may be at higher risk of sustaining a concussion, even with lower-magnitude impacts.

BRAIN SAFETY AND CONCUSSION PREVENTION: WHAT TO KNOW

- It isn't all about concussions. The repetitive "subconcussive" impacts that happen on nearly every play in some sports but don't result in concussion symptoms also affect the brain. It is important to minimize these repetitive impacts to protect the brain.
 - Children sustain impacts that cause similar forces to their brain as those sustained by their high school and college peers. Although they tend to have a shorter season, youth football players also sustain a similar number of impacts, on average, per game and practice.
 - Repetitive subconcussive impacts have been linked to long-term difficulties with brain health, including the neurodegenerative disease Chronic Traumatic Encephalopathy. The risk seems to increase with a greater number of impacts sustained over a lifetime.
 - Research shows that sustaining more of these repetitive impacts over a week or a season may increase the risk of sustaining a concussion.
 - You don't have to hit hard or often in practice to be a successful athlete.
- You don't have to sustain what seems to be a high-force impact to sustain a concussion. There is no known threshold above which the force of an impact is certain to cause a concussion or below which is certain to be safe.
- Limited light exercise can help concussion recovery. While we used to recommend staying in a dark room and limiting cognitive and physical exercise, we now know that short bouts of light exercise that does not worsen symptoms can help with recovery. This should be under the supervision of an experienced healthcare provider.

BRAIN SAFETY AND CONCUSSION PREVENTION: WHAT TO KNOW

- Brain imaging is not helpful for diagnosing a concussion. Clinical brain CTs and MRIs look normal with the vast majority of concussions. While having no findings on a brain scan likely means there is no bleeding in the brain, which is a good thing, it doesn't mean that the individual doesn't have a concussion.
- Simply passing a computerized test, like the ImPACT test, does not mean that an athlete is ready to return to play. While these tests can provide useful information, they are only one piece of the puzzle, and clinicians should consider the entire clinical exam when making a return to play decision.
- Female athletes also have higher concussion rates than males in equivalent sports. For example, female soccer players are at about double the risk of sustaining a concussion compared to male players.
- Coaches play a central role in behavior change to better address brain injuries in sports.

Primary sources:

- Julie Stamm, Clinical Professor, UW-Madison Kinesiology
- Alison Brooks, Associate Professor, UW-Madison Department of Orthopedics, Division of Sports Medicine



In addition to all of the researchers who contributed to *Volume 1*, BIOS research team members Jose Montoya, Josephine Schaefer, Justin Kakuska, Landry Levinson, Maria Dehnert, Paris Echoles, Peter Miller, Sara Jimenez Soffa, and Wquinton Smith played active roles in assembling this volume.





BIOS *connects* sports researchers, *catalyzes* new studies, and *communicates* the work across the state. To learn more, check us out at uwbios.com.

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