



# CONCUSSIONS IN GYMNASTICS

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**T**he word concussion probably brings to mind visions of high impact collisions in sports such as football or ice hockey. While it's true the majority of concussions occur in these sports, gymnastics claims its fair share of this sometimes detrimental and potentially life-threatening injury. Though not the most common injury among gymnasts, it is one of the most dangerous. Also, the numbers may be deceiving, since many concussions are not taken seriously and never reported. Since concussions do occur in gymnastics, everyone involved with the sport should understand what a concussion is, how to recognize one, and how it should be managed to prevent long term dysfunction or even death.

A common myth still perpetuated in athletic circles is that a concussion is equated with being "knocked out." In actuality, the vast majority of concussions involve no loss of consciousness. A concussion can best be described as a head injury with a temporary disruption of brain function, which can display a variety of physical, cognitive, and emotional impairments. Often times these impairments are subtle and it takes a trained health care provider to determine a concussion has even occurred. In the unfortunate event that an athlete does have loss of consciousness, the emergency

medical system should be activated (i.e. call 911) immediately.

Once a concussion is sustained, the most important thing to avoid is receiving another concussion while still recovering from the first. This can lead to second-impact syndrome—a rare but devastating condition in which arteries swell and pressure builds in the brain, and may lead to coma or death. In 2008, there were two reported cases resulting in the death of the athletes. Both occurred in high school football players who returned to playing status in just days or weeks after suffering concussions. In one of the cases, it was determined that the athlete told a teammate he was still feeling headaches after he was cleared by his doctors to return to play. Sadly, these are just two examples of numerous cases that have been documented over the years.

Decreasing the risk of such tragic consequences starts with the timely recognition that a concussion has occurred. It's important to realize concussions are not always caused by obvious reasons. Not only are they caused by a direct impact, such as a gymnast hitting her head on the balance beam, but they are also caused by indirect forces, such as a

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gymnast landing hard enough on her feet resulting in a shaking or movement of her brain inside her skull.

Countless signs and symptoms are possible in individuals who have suffered a concussion. Some of the most common are headache, dizziness, nausea, vomiting, fatigue, sensitivity to light or noise, difficulty balancing, feeling “dazed,” ringing in the ears, cognitive difficulties, memory problems, and vision disturbances. Any of these may be evident immediately, or in some instances, be delayed for hours or even days. It’s also possible for athletes to have just one or two at first and then progressively attain more, perhaps with increasing severity. Therefore, it is very important that with any head injury, no matter how minor it may seem, the athlete is repeatedly questioned to avoid overlooking a significant injury.

Many of these symptoms depend on a truthful response, and unfortunately, athletes are not always honest when answering questions about how they feel, especially if they think it may result in being held from competition or practice. It is not sufficient to ask an athlete, “are you OK?” and then leave it at that. In addition to specifically asking about common symptoms, some simple tests can be used to more objectively assess the situation. For example, instead of asking the

athlete, “are your eyes blurry?” you could have the athlete read numbers or words off a driver’s license or some other item. To test cognitive abilities, have the athlete say the months of the year in reverse order. Memory can be challenged by giving the athlete a few simple words to be recalled after 5 to 10 minutes, in addition to remembering such things as the current year or his/her own name.

The presence of any of these signs or symptoms is enough to suspect a concussion and the athlete should immediately be seen by a certified athletic trainer or physician. Do not hesitate to call 911 if symptoms are quickly getting worse. “If the athlete does see a physician, they should be evaluated by a sports medicine physician who is knowledgeable in the diagnosis and management of sports related concussions,” says Dr. Joel Kary, a physician with St. Vincent Sports Medicine in Indianapolis and team physician to Butler University, Indiana Invaders Track Club, and Lawrence North High School. “The unique demands of athletic competition and potential for further injury require a thorough clinical exam and possibly the ordering of appropriate tests. CT or MRI scans of the brain are rarely needed in the evaluation of concussions, but may be necessary if there is any concern for physical damage to the brain.”

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Once the diagnosis of concussion is made by a qualified health care provider, it is imperative that person has the final say as to when the athlete can return to practice or competition. Due to the serious nature of what’s at stake, it can be a difficult decision to make for all involved. Since the current recommendation is that the athlete be free of all signs and symptoms, both before and after physical exertion, careful evaluation procedures and continued communication must take place. “Management of a concussion is a team approach and requires excellent communication between the physician, athletic trainer, athlete, coach, and parents in order to attain the best outcome,” adds Dr. Kary.

To help in this regard, computer programs that test brain function have been developed and are quickly becoming the standard of care. Certified athletic trainers and physicians may use these programs to greatly enhance their ability to objectively measure reaction time, memory, and other cognitive processes. Ideally, the athlete will have baseline data from these tests on record and post-concussion data can then be compared. In most cases the tests will show significant changes for the worse initially, but athletes generally return to their baseline or better within a couple weeks. Speak with a sports medicine physician or certified athletic

trainer about getting a computer-based protocol (such as ImPACT™) implemented in your facility. “The addition of computerized testing in managing concussions has significantly improved our ability to return athletes to their sport in a safe and timely manner. Determining whether an athlete has returned to their “baseline” on computerized testing has proven to be a very useful tool in the management of concussions,” adds Dr. Kary.

In some instances a condition called post concussion syndrome may develop and cause a longer recovery time. This is basically when athletes experience prolonged symptoms for weeks, months, and occasionally years. Referrals to a neurologist and/or neuro-psychologist may be necessary for further testing and treatment. “I really feel the incidence of post concussion syndrome can be decreased by promptly reporting any signs or symptoms of concussion and treating it appropriately from the very beginning,” continues Dr. Kary.

Unfortunately children seem to heal quicker with everything except concussions. Injured athletes may need to sit out longer than desired, but with the threat of second-impact syndrome and long term brain damage, we must be diligent with their care. Their lives may depend on it. ✖