What Is a Concussion?
A concussion is a brain injury that interferes with normal brain function, leading to temporary cognitive and physical deficits. Concussions are functional brain injuries, not structural. This means that microscopic injury occurs within the neurons of the brain, leading to impairments of how the brain operates. This is in contrast to structural injuries, or moderate to severe brain injury, in which bleeding within the brain, skull fracture or other large scale structural damage occurs. While concussions are labeled as mild brain injuries, they need to be taken seriously, as improper management can lead to permanent functional deficits and, in rare cases, death.

How Does a Concussion Occur?
Concussions typically occur as a result of the head’s sudden change in direction or speed. The brain inside the head continues to move along its original path. The result is stretching of neurons and other microscopic damage throughout the brain. As it attempts to heal itself, the brain requires more resources to function than the body can provide. This can lead to multiple symptoms which may include:

How Is a Concussion Treated?
A concussion is an injury that, if treated properly, will heal on its own. Caring for a concussion is centered on creating the best environment possible to allow the brain to rest and recover. This can require some accommodations and restrictions for normal daily activities. Every concussion is unique and therefore care needs to be personalized for each individual, and for each concussion.

Several Recommendations That are Generally Suggested:

LIMIT MENTAL EXERTION
Activity that requires focus and concentration like school, homework or reading can cause an increase in symptoms. The following accommodations are often recommended:

- Students typically need to stay home from school initially
- Return to school should start with quarter-days to half-days when symptoms permit
- When returning to school, consider alternating classes to avoid getting too far behind
- Work with your school for individualized accommodations from teachers: eliminate non-essential homework/projects and allow extra time for make-up assignments
- Avoid loud areas like music/band classes, lunchrooms, shop class and hallways in between classes
- Some classes/subjects can be more challenging to work back into than others. Special accommodations may need to be considered for specific subjects.

LIMIT VISUAL ACTIVITY
Large amounts of visual stimulation require more energy usage from the brain and, in turn, typically increase symptoms. This includes television and computer usage, as well as activities such as texting, video games and reading. All of these activities should be avoided until cleared by your
physician and should be gradually reintroduced only when symptom-free or when symptoms are manageable. Leisure activities (video games, Facebook, etc.) should only be re-introduced once students are able to tolerate full academic activity.

AVOID PHYSICAL ACTIVITY
All physical activity can potentially lead to prolonged symptoms. All contact activity and unnecessary physical exertion is to be avoided until you are completely symptom-free and cleared by a physician. If a second injury to the brain occurs before the first has healed, Second Impact Syndrome can occur. This can lead to permanent brain injury and even death. Attending sports practices and games can cause an increase in symptoms due to the amount of audio, visual and emotional stimulation.

SLEEP
Rest and sleep are some of the most important ways to help a concussion heal. Concussed individuals are often fatigued and typically go to bed earlier and sleep later than normal. This is normal, but individuals should stick to a consistent bedtime schedule in a dark, quiet room with no electronics in the bedroom. Allow for 30 minutes of “down time” before bed to avoid difficulty falling asleep. Napping throughout the day can be beneficial, but refrain from naps longer than 20-30 minutes to avoid throwing off nightly sleep patterns. The supplement melatonin may be beneficial for promoting sleep at night.

DIET/HYDRATION
Stick to a regular eating schedule and don’t skip meals. Maintain adequate hydration, preferably with water. A 100-pound child/adolescent should drink at least 70 ounces of water per day. Avoid being in the sun or hot environments when possible. Occasionally, your physician may recommend supplements, such as fish oil.

PAIN CONTROL
Headache is the most common symptom of a concussion. Most headaches are treated with over-the-counter (OTC) medications. Tylenol is preferred over other medications initially. If OTC medications are not providing adequate relief, contact your doctor.

Returning to Sports and Other Activities
A specific return-to-play protocol will be provided by your doctor once concussion symptoms have resolved. This protocol involves a gradual progression back into physical activity to ensure that symptoms do not return when attempting physical activity. Once symptom-free, follow-up with your doctor before attempting exercise on your own. Concussed individuals need to be cleared by a physician before returning to sports and physical activity. It is normal for an athlete to be upset about missing a game or event. With that said, there is serious risk in returning to physical activity too soon, and returning to physical activity too quickly, can result in prolonged symptoms, permanent injury and even death.

Concussion Resources
Looking for more information on concussion? The Center for Disease Control’s website on concussion is an excellent resource for parents, schools and coaches: www.cdc.gov/concussion/index.html

To make an appointment with the Froedtert & the Medical College of Wisconsin Concussion Management Program call 414-805-5005.
A loss of consciousness (LOC) is NOT REQUIRED for a concussion to occur, nor does it indicate severity of a concussion. Some concussions in which there was LOC resolve in a matter of days, while some concussions that occurred without LOC take several weeks to heal.

Multiple research studies have provided evidence that once you have sustained a concussion, you are at a significantly higher risk of concussions in the future. Symptoms tend to be worse with each subsequent concussion as well.

Concussions can affect mental and emotional health and, occasionally, bring on symptoms related to depression and anxiety. Concussions may also intensify previously existing conditions such as these.

Girls tend to be more susceptible to a concussion than boys and may take longer to recover.

About 40 percent of adolescents have symptoms that last longer than three weeks. Because the adolescent brain is still developing, it typically takes longer to heal than the adult brain.

Athletes are likely to hide symptoms and require careful, detailed questions about how they feel and how they function (sleeping, homework, computer time, etc.).

Imaging studies (MRI or CT) are not often needed for concussions. Typically, these studies are ordered when there is concern of a skull fracture or bleeding within the brain. Occasionally, these studies are ordered to look for other structural abnormality if healing has not occurred within a reasonable timeframe.

Helmets and mouth guards CANNOT prevent concussions. No equipment exists to keep the brain from shifting within the skull. Ensuring properly fitted protective equipment and teaching proper technique are the best ways to allow an athlete to participate safely.

40 percent of teens admit to lying about their symptoms.