

Pediatric Concussion Management

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Pediatric Concussion Management

The purpose of this eBook is to provide information on concussions, management of concussions, and what to expect in the recovery process.



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Your Care at Geisinger

At Geisinger Health System, your **care, safety** and **experience** are our top priorities. We strive to meet and exceed healthcare standards for your safety, quality of care and experiences.

At Geisinger, we believe the more you know about your concussion recovery process, the better equipped you will be in the process.

Where do I go for a concussion at Geisinger?



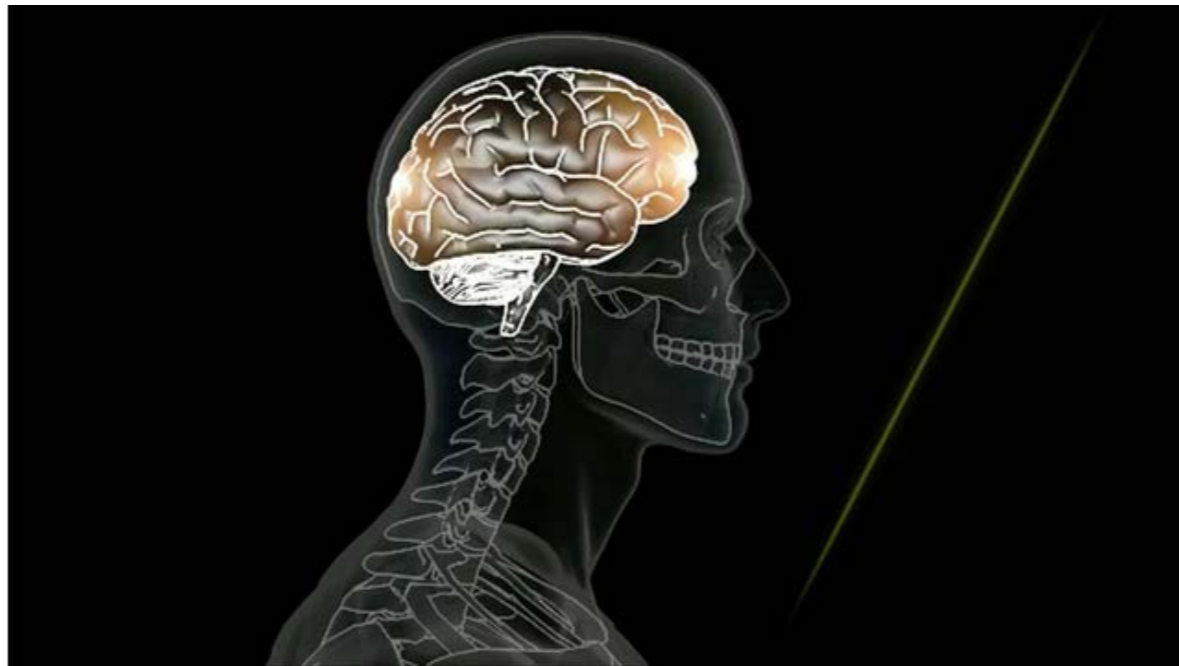
-  [Sports Medicine](#)
-  [Neurology](#) & [Neurosurgery](#)
-  [Neuropsychology](#)
-  Emergency Department

Call 800-275-6401 to schedule
an appointment



What is a Concussion?

Learn exactly what a concussion is and why it is so important to allow your brain to fully recover. **Tap on the image and watch this brief video** from the Centers for Disease Control (CDC).



What's a concussion?

A concussion is a bump, blow or jolt to the head or a force that causes the head to move quickly without actually hitting anything. There may or may not be a loss of consciousness.

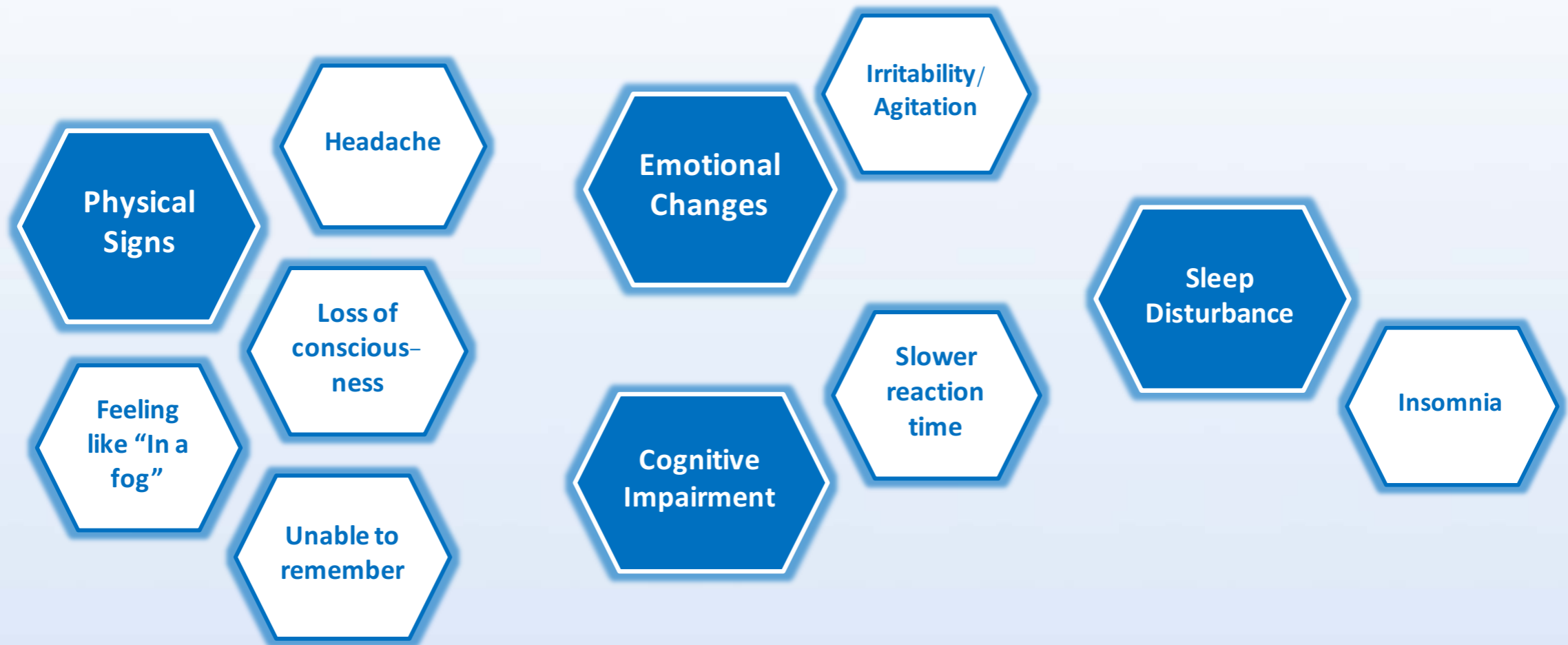
A concussion can affect a person physically, socially, psychologically, and spiritually.



To learn more, click [HERE](#) to watch more videos about **brain injury basics** from the CDC.

Diagnosing A Concussion

One or more of the following must be present:



If one or more of the these are present, a concussion should be suspected.

You may see...



Physical Symptoms

Headaches

Nausea/
Vomiting

Blurred
Vision

Seizures

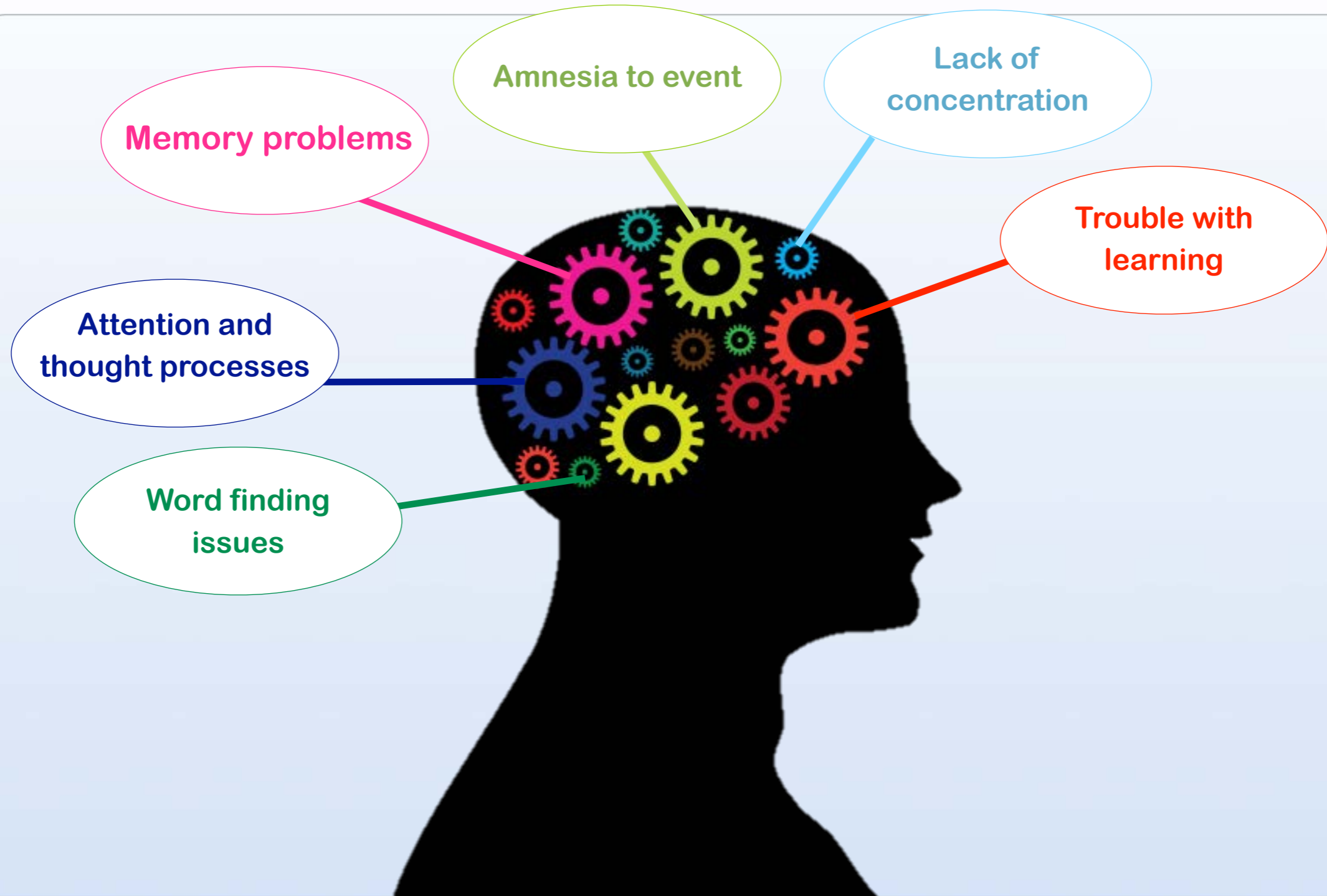
Hearing
Issues

Dizziness

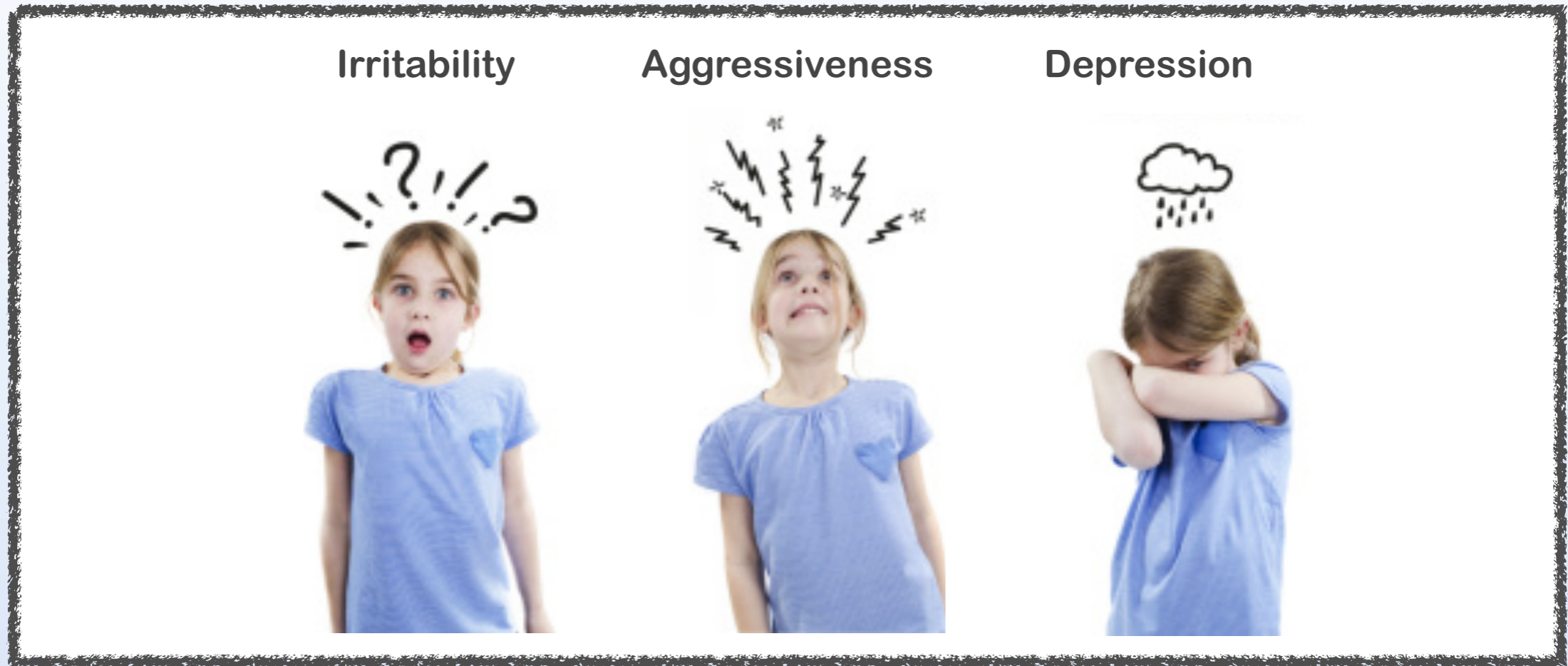
Problems
Sleeping



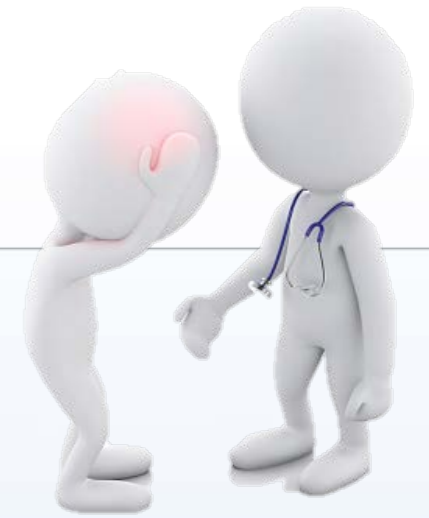
Cognitive Issues



Emotional/Behavioral Issues



Recovery



The majority of concussions recover in **7-10 days**, but it may be longer. Rest the first few days, then gradually do a little more activity each day over the next week or two. Since every concussion is different, you may need less or more time to recover. Concussion patients should see a doctor prior to returning to sports.



- Get rest
- Take it slow
- Talk to your health care team

Learn more from the Centers for Disease Control here:
http://www.cdc.gov/headsup/basics/concussion_recovery.html



Home Care



If symptoms persist, you may need to see a doctor.



Return to Play



The risk of a second impact shortly after initial injury can be serious.



* Tell gym teachers, coaches and athletic directors about the injury!

* Get clearance by a specialist familiar with concussion/TBI (traumatic brain injury).





Return to School

- When returning to school, you may...
- have trouble concentrating
 - need rest breaks during the day
 - need extra time on tests
 - need notes printed out by the teacher
 - practice problem solving at home

DON'T FORGET

- * Tell teachers and counselors about the injury!
- * Check to see if the school has a concussion management team!

Tap on the image!



REAL STORIES

SARAH

"AFTER MY CONCUSSION, I STRUGGLED IN SCHOOL."

READ SARAH'S STORY >>

cdc.gov

Section 6

Proper Helmet Fitting

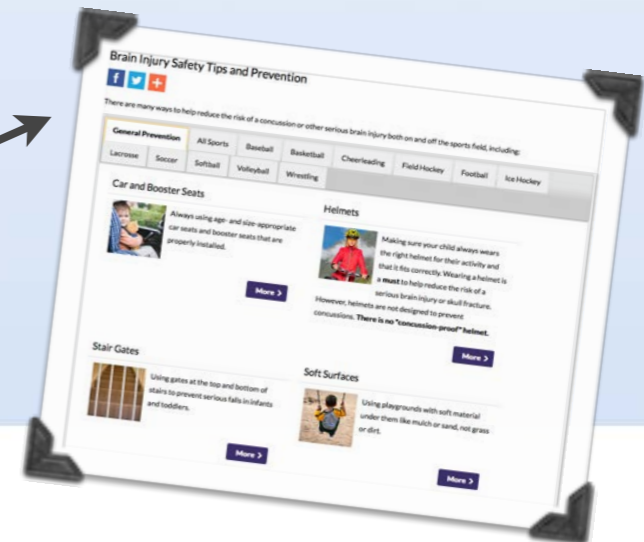


Always wear a helmet when riding a bike!

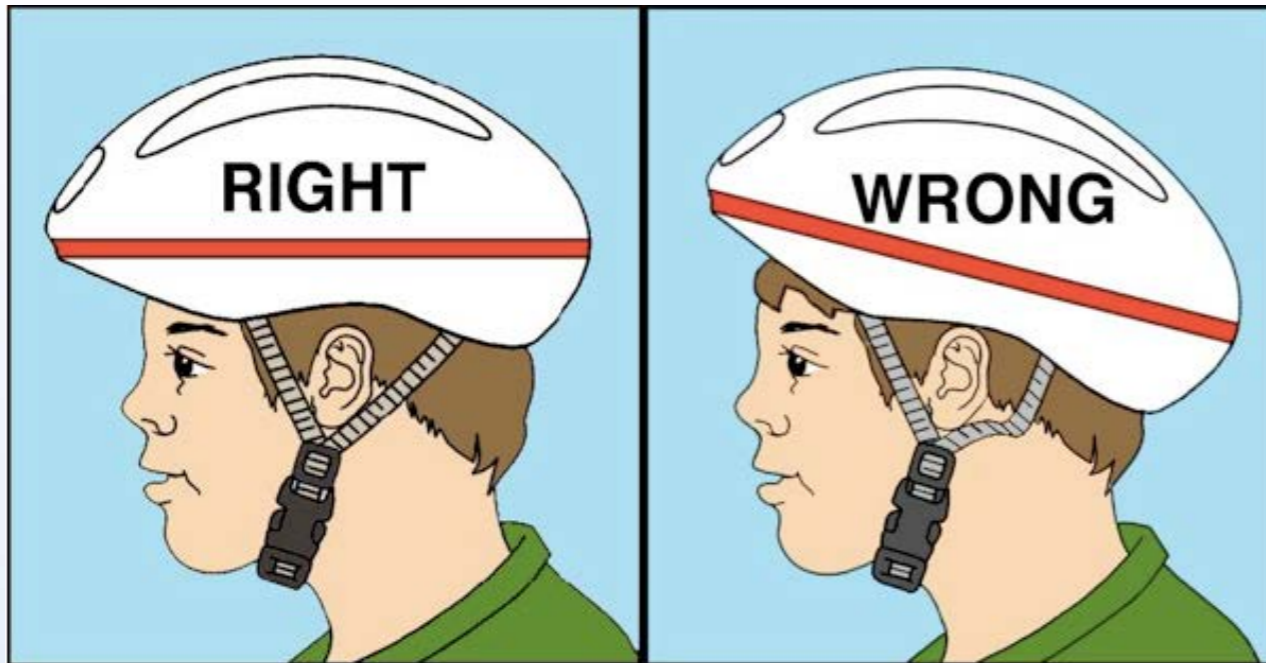
Wear appropriate protective gear to sporting activity!



Tap here to learn more about Brain Injury Safety Tips and Prevention



Proper Helmet Fitting



Wear the helmet flat on the head, not tilted back at an angle!

(Courtesy of www.cpsc.gov)

Fitting Your Bike Helmet

Buy it. Fit it. Wear it. EVERY RIDE!

The Proper Helmet Fit
Helmets come in various sizes, just like hats. Size can vary between manufacturers. Follow the steps to fit a helmet properly. It may take time to ensure a proper helmet fit, but your life is worth it. It's usually easier to look in the mirror or have someone else adjust the straps. For the most comprehensive list of helmet sizes according to manufacturers, go the Bicycle Helmet Safety Institute (BHSI) Web site at: www.bhsi.org/.

STEP 1
Size:
Measure your head to find your size. Try on several helmets in your size until one feels right. Now put the helmet level on your head and adjust the sizing pads or fit ring until the helmet is snug.

STEP 2
Position:
The helmet should sit level on your head and low on your forehead—one or two finger-widths above your eyebrow.

STEP 3
Side Straps:
Adjust the slider on both straps to form a "Y" shape under, and slightly in front of, the ears. Lock the slider if possible.

STEP 4
Buckles:
Center the left buckle under the chin. On most helmets, the straps can be pulled from the back of the helmet to lengthen or shorten the chin straps. This task is easier if you take the helmet off to make these adjustments.

STEP 5
Chin Strap:
Buckle your chin strap. Tighten the strap until it is snug, so that no more than one or two fingers fit under the strap.

STEP 6
Final Fitting:
A. Does your helmet fit 'right'? Open your mouth wide...big yawn! The helmet should pull down on your head. If not, refer back to step 5 and tighten the chin strap.
B. Does your helmet rock back more than two fingers above the eyebrows? If so, unbuckle and shorten the front strap by moving the slider forward. Buckle and retighten the chin strap, and test again.
C. Does your helmet rock forward into your eyes? If so, unbuckle and tighten the back strap by moving the slider back toward the ear. Buckle and retighten the chin strap, and test again.
D. Roll the rubber band down to the buckle. All four straps must go through the rubber band and be close to the buckle to prevent the buckle from slipping.

Helmet Laws
More children ages 5-14 go to emergency rooms for bicycle-related injuries than with any other sport; many are head injuries. As a result, many States and local jurisdictions have child bicycle helmet laws to increase and better ensure the safety of children when bicycling. See: www.helmets.org/mandator.htm. Like car crashes, bicycle crashes can happen at any time, involving not only children, but adults, many of whom are skilled riders. In fact, middle-age adults represent the average age of bicycle riders killed and injured. Helmets are the single most effective piece of safety equipment for riders of all ages. If you crash, Everyone should choose to wear a helmet; it just makes sense!

For more information on bicycle safety, visit the National Highway Traffic Safety Administration Web site at: www.nhtsa.dot.gov/bicycles

ROLL MODEL

NHTSA

DOT HS 811 568
April 2012

8019-00212-v2

Tap [here](#) or on the images to the right for more information on bicycle safety at the National Highway Traffic Safety Administration Web Site.

Myths & Facts about Concussions

Myth: Loss of consciousness is necessary to have a concussion.



Fact: Loss of consciousness (LOC) is not necessary to diagnose concussion; in fact, most individuals who have a mild to moderate traumatic brain injury, including concussions, do not have LOC. Rather, change in mental status such as confusion, disorientation, and memory problems are characteristic of concussion.

A concussion is a mild brain injury or head injury in which trauma to the head results in a temporary disruption of normal brain function. After a concussion, the brain does not work right for awhile. Loss of consciousness may or may not occur, but confusion or problems with memory are usually present, at least initially.

Myth: A normal head MRI or CT means a patient should be cleared to resume all normal activities.

Fact: A normal head MRI or CT does not provide enough information to guide decision-making about activities such as return to school and return to play sports. A head MRI or CT involves a structural image of the brain but does not provide information about functional aspects of brain physiology, which have been demonstrated in research as the key aspects of concussion. While sophisticated and expensive functional imaging studies are not the standard of care for clinical practice, thorough evaluation by a specialist in concussion management who may use balance testing, neurological exam, and neurocognitive testing is indicated. At Geisinger, such specialists include Sports Medicine physicians, neuropsychologists, and certified athletic trainers. Each concussion needs to be managed based on symptom presentation and neurocognitive functioning, which can be assessed by our specialists who then guide return to play, work, school, etc.



Myth: All athletes should be held out for one week each time a concussion occurs.

Fact: There is no universal time period to keep an individual out of a sport or other activity. While there are some guidelines that help determine generally how long of a recovery period may be indicated before the individual is cleared to return to play sports or other activities, each individual and each concussion needs to be managed on an individual basis.

Different guidelines apply based on the individual, including personal medical history (e.g. prior history of concussions, migraine headaches, etc.) and age (i.e. there is research evidence that younger athletes such as high school students and children may require more time to recover following concussion and therefore need to remain out of play longer than adults/professional athletes.)

Also, length of time a person needs to rest before returning to usual activities cannot be accurately determined at the time of injury or initial presentation for medical care. Rather, monitoring of the individual's recovery process including post-concussion symptoms and neurocognitive functioning (such as memory, attention, reaction time and processing speed) are important.

There are well over a dozen sets of guidelines for “grading” concussion severity and recommendations for return to activities. Unfortunately, most of these are outdated and not based on research data (empirical evidence). More recently, the field has advanced to a point that it is now accepted that each person needs to be managed individually, applying guidelines and practice parameters while using evidence-based clinical management for each individual, each time there is a concussion.





ImPACT: Immediate Postconcussion Assessment and Cognitive Testing

Geisinger offers a high level of evidence-based, personalized care. Geisinger's concussion experts are Certified Consultants for ImPACT (Immediate Postconcussion Assessment and Cognitive Testing).

ImPACT is an evidence-based neurocognitive test that is often used along with a comprehensive physical examination by a physician that has been trained to treat concussions and determine when an athlete is ready to return to play.

For more information on ImPACT testing, visit <http://www.impacttest.com/>.

The experts at Geisinger help those with concussions recover using the most advanced and trusted techniques modern medicine has to offer. If you or your child sustains a minor head injury, contact us today for an appointment.

1-800-275-6401

Concussion Articles by Geisinger

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Parents: Learn the signs of a concussion



There's a lot of excitement surrounding your kids putting their team uniforms back on and hitting the field. You get to cheer on all of their hard work and athleticism as they begin their new season. But as much as you're looking forward to watching your children play, as a parent you have the innate fear of them getting hurt.

"Even if youth athletes take precautions against injuries by strength conditioning, warming up and stretching, injuries are unfortunately always a possibility on athletic fields," said Jason Scotti, M.D., a primary care sports medicine specialist at Geisinger's Orthopaedic Institute.

Concussions are one of the most common injuries among youth athletes, often caused by a hard hit, bump, blow to the head or another injury that jars or shakes the brain inside the skull. But unlike cuts, abrasions or fractures, you can't see a concussion. And, to make matters more confusing, sometimes it takes a few hours or days for signs of a concussion to appear.

"Symptoms of a concussion may not be present or noticed at the time your youth athlete gets injured – it may be days or weeks before they appear," Dr. Scotti cautioned. "Plus, the symptoms are often subtle or unnoticed, which makes it all the more important for parents to know what the symptoms are so they can recognize them."

Symptoms of a concussive traumatic brain injury fit into four main categories: thinking and remembering, physical, emotional and mood, and sleep – the most common symptoms are headache, loss of memory or amnesia, and confusion.

"Someone suffering with a concussion may not think clearly, feel slowed down, not be able to concentrate and not be able to remember new information," Dr. Scotti said of thinking and remembering symptoms.

Physical symptoms of a concussion include nausea and vomiting, fuzzy or blurry vision, dizziness, sensitivity to light or noise, balance issues, and feeling tired or having no energy.

"Concussion symptoms also come in the form of emotions – someone with a concussion may be easily upset or angered, sad, nervous or anxious and, in general, just more emotional," Dr. Scotti said.

A concussion can also cause someone to sleep too much, too little or have a hard time falling asleep.

"Coaches, athletic trainers and team physicians are all trained to know the signs of a concussion, but if symptoms are delayed, parents - who know their kids best - may more easily notice changes or symptoms of a concussion," Dr. Scotti said.

If you notice any of these symptoms and think your child has suffered a concussion, get them medical treatment right away. Your doctor will be able to determine if they have a concussion, how severe it is and when it's safe for them to return to their normal activities and the playing field.

"It's important to keep your youth athlete out of practice and games until their concussion heals. It takes time to heal and, if they return to their sport too soon, they're at a greater risk of having a second or more serious concussion," Dr. Scotti said. You should also inform your child's coach about the concussion, who will likely need confirmation from your doctor when it's safe for them to return to the sport.

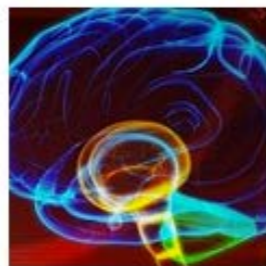
Jason Scotti, M.D., is a primary care sports medicine specialist at Geisinger's Orthopaedic Institute. For more information or to schedule an appointment, please call 570-808-6086.

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Posted by: **Geisinger Wellness**

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Concussions and sports



A concussion is a mild form of traumatic brain injury. It happens when a blow to the head or a whiplash movement forces the vital 3-pound organ to jerk back and forth and crash against the skull, damaging delicate brain tissue.

Roxanna Larsen, L.A.T., A.T.C., program manager for Orthopaedic Sports Medicine at Geisinger Health System says, "Although concussions are not usually life-threatening, we are now starting to understand that effects from the impact can sometimes be serious and long-lasting."

Don't be fooled, concussions don't always knock you out. Headaches and dizziness are the most common symptoms. According to the Centers for Disease Control and Prevention, 5 to 10 percent of athletes will have a concussion in a single season, typically those who play contact sports. Football players have a 75% risk for concussion - for women who play soccer, it's 50%.

One hundred percent head protection can never be fully guaranteed, but Larsen suggests the following five actions to help protect from and prevent any serious brain injuries.

1. Helmets and mouth guards won't provide complete protection from concussion, but they can cut the risk. Make sure the head gear fits properly and has been tested by the American Society for Testing and Material
2. Conditioning exercises to strengthen neck muscles could help protect younger athletes
3. Some sports leagues and Pennsylvania schools provide pre-injury baseline computer tests to check memory, problem solving and reaction times. If an athlete has a concussion, the test can be used as a comparison tool. It can also be used to help doctors determine when the athlete is ready to get back in the game.
4. Players who have a concussion during a game should be sidelined immediately and not return to play until a qualified health professional, such as a certified athletic trainer, performs an evaluation and determines return-to-play status. Remember, rest and relaxation is critical to help the brain heal.
5. Parents, coaches and athletes should learn more about the risks, symptoms and treatment of concussions and get involved in school and league policies. Changing the rules and teaching concussion prevention strategies can go a long way in reducing the risk.

For more information or to schedule an appointment with a Geisinger orthopedic and sports medicine specialist, please call 800-275-6401 and state "Sports Medicine" when prompted or visit www.geisinger.org/ortho.

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Image courtesy of Topstep07/freedigitalphotos.net

Posted by: **Geisinger Wellness**

Why baseline tests for concussions are important



Concussions are common but potentially serious injuries sustained by many youth athletes. A concussion is actually a brain injury caused by a sudden direct blow or bump to the head, something that can happen regularly on athletic fields.

"Your brain consists of soft tissue, surrounded and cushioned by spinal fluid and protected by the skull. An impact can jolt the brain, causing it to move around in your head," said Neil Holland, M.D., regional director of neurology, Geisinger Wyoming Valley Medical Center. "This can cause bruising, damage to blood

vessels and direct injury to brain cells, leading to traumatic brain injuries. This type of damage can result in learning difficulties, impaired vision, loss of balance and blackouts."

Dr. Holland emphasized the importance of immediate evaluation if you think you've sustained a concussion. This evaluation might include an examination, some balance tests and a computer-based test to determine how well your brain is functioning. "We can compare the results to the pooled normative data that we have, but the results are much more accurate when we can compare them to how you did before the injury," Dr. Holland said. "That's where baseline testing becomes very helpful. It lets us compare apples to apples."

Baseline testing is a proactive measure you take before your youth athlete steps onto the field. Baseline tests conducted by trained health care providers are used to evaluate an athlete's balance and brain function, which includes learning, memory, the ability to focus, and how quickly they can think and solve problems.

"Its name describes the purpose of the test: to establish an athlete's baseline cognitive functioning prior to any injury," Dr. Holland said, adding that the series of tests take only about 30 to 45 minutes to complete. Baseline testing is highly recommended for athletes participating in contact sports like football, basketball, lacrosse, soccer, hockey, cheerleading and gymnastics.

During the pre-injury test, your child will be checked for concussion symptoms, and balance and cognitive skills such as concentration and memory will be tested. Computerized or paper-pencil neuropsychological tests may also be included to assess your child's concentration, memory and reaction time.

"The doctor performing your child's baseline testing will also look for a prior history of concussions, the symptoms your child experienced and how long it took them to recover," Dr. Holland said. Other medical conditions your child may have will also be recorded in this testing, especially if they have the potential to affect concussion recovery, such as migraines, depression, mood disorders, anxiety, learning disabilities, or Attention Deficit/Hyperactivity Disorder.

If your child does suffer a concussion, your doctor will be able refer to the results of their baseline test.

"Your child's physician will compare the results of the baseline test with post-injury test results to identify what effects the injury has had and to determine if and when it's safe for them to return to school and their sport," Dr. Holland said.

If your youth athlete never sustains a concussion, you may never need to refer to the results of a baseline test, but they're there just in case.

Neil Holland, M.D., is the interim director of neurology at Geisinger Health System. To make an appointment with Dr. Holland or another neurologist, please call CareLink at 800-275-6401.

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Posted by: **Geisinger Wellness**

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Hard hits: what you need to know about concussions and CTE

Posted by: **Geisinger Wellness**



With Super Bowl 50 right around the corner, most people's excitement is growing around the final matchup, the commercials and halftime show. But another discussion that has been prominent the entire National Football League (NFL) season is about hard hits - specifically concussions.

Both the Will Smith movie "Concussion," which highlighted the concussion-related condition Chronic Traumatic Encephalopathy (CTE) in former NFL players, and the tragic death of 27-year-old Tyler Sash, a former New York Giants' player who had a high level of CTE, have raised public concern.

But the medical community has been well aware of sports-related concussions for some time.

"The medical community has always focused on the seriousness of head injuries and those within football are even more committed to providing greater safety," said Matthew McElroy, D.O., a Geisinger Health System orthopaedics-sports medicine physician. "There are now more concussion-related safety protocols in place for players at all levels of the game. And the helmet technology has also improved considerably to try and prevent concussions."

Yet football is a contact sport and concussions can't be eliminated entirely. While concussions are the least serious type of traumatic brain injury (TBI), they're still in fact a brain injury caused by a bump or blow to the head that shakes the brain inside the skull. They can cause some significant side effects.

"Adults with concussions find that the injury can negatively impact their ability to work and focus on their professional and personal responsibilities," Dr. McElroy said. "Children with concussions see a similar impact on their ability to perform and concentrate at school, in extracurricular activities and in their social lives."

Symptoms can last for days, weeks or even longer. In some cases, these symptoms are subtle or not apparent right away.

"Common symptoms after suffering a concussion are confusion, headache and loss of memory," Dr. McElroy said.

Other signs and symptoms include:

- Feeling dazed
- Slurred speech
- Nausea or vomiting
- Clumsiness, dizziness or balance issues
- Sensitivity to light and/or noise
- Blurred vision
- Difficulty concentrating
- Changes in behavior or personality

Symptoms of a concussion are typically exacerbated by mental or physical activity.

The NFL has recently taken a stricter stance on head injuries and concussions, in part because of the discovery of CTE on the brains of its former players.

"CTE is a devastating progressive degenerative brain disease caused by repetitive brain trauma, including concussions," Dr. McElroy said.

While CTE isn't a new condition - it's been known to affect boxers since the 20s - recent studies have confirmed the disease in deceased professional football players and other athletes with a history of repetitive brain trauma.

"The repetitive trauma appears to trigger the progressive degeneration of brain tissue that can begin anywhere between months, years or decades after the last brain injury or retirement from sports," Dr. McElroy said. CTE is linked to memory loss, impaired judgment, confusion, aggression, impulse control and, eventually, progressive dementia.

"We really cannot say how many concussions might lead to CTE," Dr. McElroy said. "We are really in the investigative phase with this whole phenomenon."

For more information or if you have questions, email sportsmed@geisinger.edu or call 570-271-6700 and select option 3.

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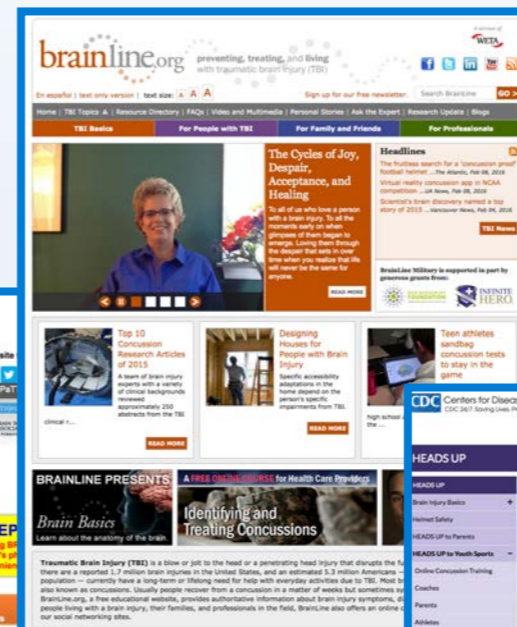
Section 9 Resources

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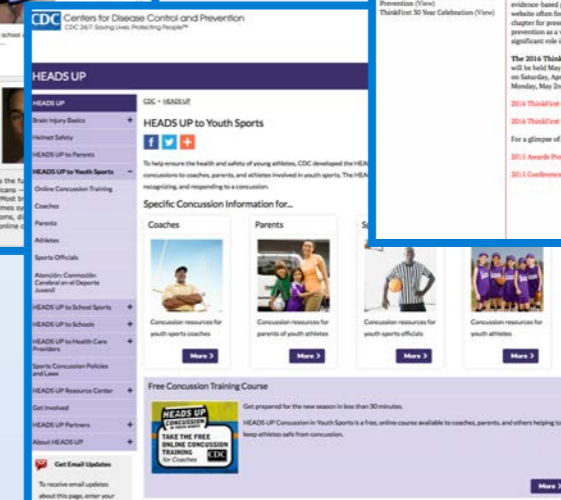
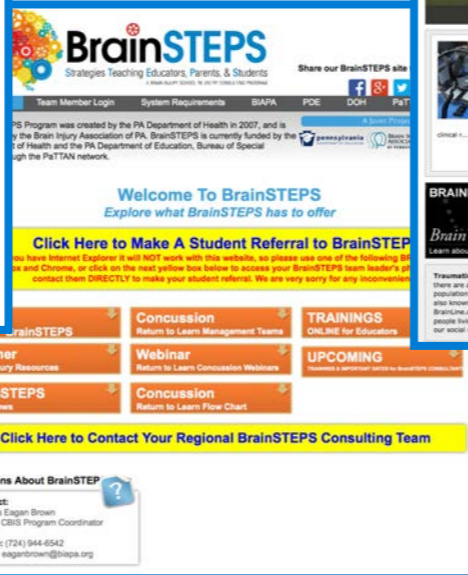
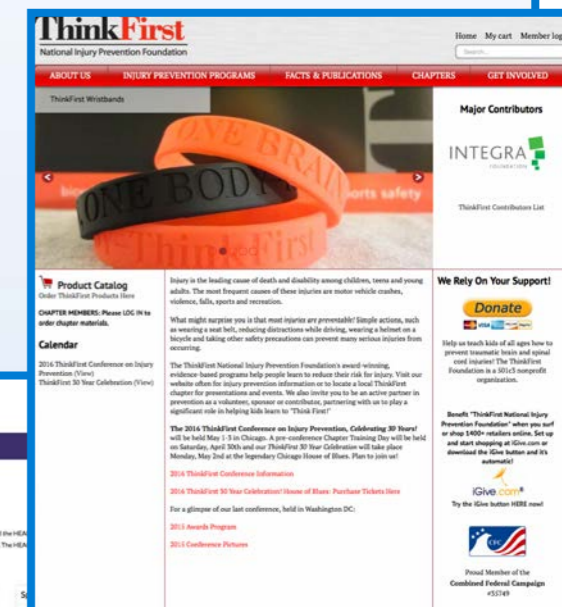
SafeKids Worldwide



Brainline.org



ThinkFirst



Brain Injury Association of PA

BrainSteps

Centers for Disease Control and Prevention HEADS UP