Brain Injury 101

A How to Guide for School Professionals

Part of the On the Road to Adulthood: Getting There Safely toolkit developed by the Brain Injury Alliance of Connecticut.

Brain Injury Alliance CONNECTICUT

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August 2016

This toolkit was developed by the Brain Injury Alliance of Connecticut, and is intended for school professionals to deliver to groups of high school students. The toolkit covers topics including functions of the brain, effects of brain injury, incidence of brain injury in teens, and strategies to reduce brain injury through motor vehicle safety (seat belt use, distraction free driving, the Connecticut Graduated Driver's License), helmet use, pedestrian safety, and concussion awareness. The toolkit was developed by the Brain Injury Alliance of Connecticut with the generous support of the Savings Bank of Manchester's Charitable Foundation, Inc.—*We're Pulling For You* grant. The Brain Injury 101 game is part of an overall toolkit—On the Road to Adulthood: Getting There Safely, available online at www.biact.org/protectyourbrain.

On the Road to Adulthood: Getting There Safely
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Step 1: Administer the Brain Injury 101 pre-test as a means to measure the students' knowledge prior to the reading assignment and game.

Step 2: Assign the *Brain Injury 101 Reading Assignment* to students. The reading assignment can be provided the night before, or prior to playing the game. All of the questions contained in the Brain Injury 101 game are covered in the reading assignment.

Step 3 Assign a scorekeeper or assign yourself as the scorekeeper—whichever will be easier for you. You will also be the "host" of the game—presenting the questions and answers. The presentation includes speaker notes to go along with each question and answer. You can also opt to assign a student as the "host" if you choose. You know your students best.

Step 4: Break students into teams that will compete in the game. You can choose as many teams as you like, depending upon the size of the group and the amount of time you have to devote to the game. Ask each group to choose a Team Captain who will be responsible for conferring with his team before providing the final answer for their team.

Step 5: Let the game begin! Since you will be playing in teams, you will need to veer from the typical game show style of buzzing in when you know the answer. Instead Team A will begin by choosing a category and amount. For example, Once Upon a Brain for 100. You will also need to keep a copy of Slide 1 handy to keep track of the questions already asked. Each Team Captain will consult with their team for a maximum of 30 seconds to decide on their final answer. Once their final answer is provided let them know if they are correct or incorrect, and let them know what is in the speaker's notes so that they can better understand the answer. Following the first question, it would then be Team B's chance to choose, followed by Team C and so on.

Step 6: Once all the categories have been cleared allow the scorekeeper to tally the results and announce the winner. You can determine the "prize" for the winning team. They can simply have bragging rights or a night off from homework. Again, your know your students best.

Step 7: Administer the Brain Injury 101 post-test as a means to measure the students' knowledge after the reading assignment and game are complete.

Remember that the goal is to raise awareness of brain injury and the prevention of brain injury, with the ultimate goal of keeping our students safe well into adulthood. Also, HAVE FUN!

Brain Injury Alliance of Connecticut (BIAC)

Connecticut's partner in brain injury prevention & recovery for more than 30 years.

An independent, non-profit organization dedicated to supporting individuals with brain injuries, their families, and caregivers while increasing awareness of brain injury and its prevention.

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What Is brain injury?

Acquired brain injuries are typically brain injuries occurring after birth but not related to degenerative diseases, congenital or hereditary factors. They may cause temporary or permanent impairment(s). Impairments can include physical functions, cognition and psychosocial behaviors. Causes of acquired brain injury can include, but are not limited to the following:

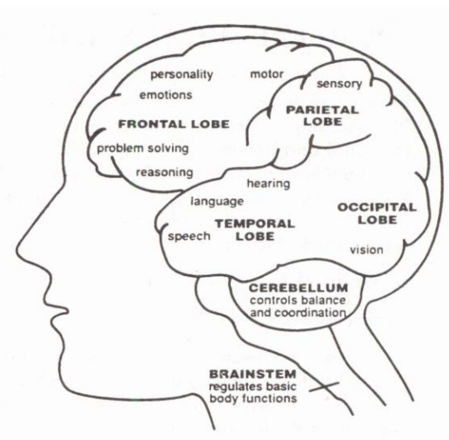
- Strokes
- Traumatic Brain Injury (TBI)
- Substance Abuse
- Anoxia/Hypoxia (loss of oxygen to the brain)
- Infections
- Seizures
- Tumors
- Toxic Exposures

In basic terms, **traumatic brain injuries** are typically defined as a blow or jolt to the head or body, or a penetrating head injury that disrupts brain function. Not all blows and jolts to the head result in a TBI. You don't necessarily have to hit your head to sustain a brain injury. If your body sustains a very hard blow or shake which causes your brain to move rapidly and forcefully within your skull, then this might also cause some injury to the brain. In addition, blast injuries, such as seen in our military, can also cause injury to the brain.

Impairments from a brain injury can be temporary or permanent, and the range of impairment can be partial or full. The severity of a TBI is usually considered to be within a range from 'mild'—a brief change of mental status or consciousness, to 'severe'—an extended period of unconsciousness or memory loss after injury.

Causes of traumatic brain injury can include, but are not limited to the following:

- Falls
- Motor Vehicle Crashes
- Struck by/against incidents
- Assaults
- Gunshot Wounds
- Sports Injuries
- Blast Injuries
- Other injuries caused by trauma



In adolescents and teens, the most common causes of injury to the brain include being struck by or against something, sports & recreational injuries, assaults, motor vehicle crashes, and falls.

How does brain injury affect you?

The human brain controls everything we do, including breathing, walking, talking, thinking, behaving and feeling. Unlike a bone that can break and heal, our brains can be injured and not repair themselves. While up to 80% of mild brain injuries, such as concussions, can resolve in 2-3 weeks, some mild and more severe brain injuries usually have lifelong consequences that affect an individual on a day to day basis.

Brain injury affects every individual differently, and no two brain injuries are alike, but there are common consequences of brain injury. Brain injury can cause a wide range of functional short or long-term changes affecting thinking, sensation, language, or emotions.

- Motor Issues (motor control and coordination, loss of the range of motion, paralysis)
- Cognition & Thinking (memory, reasoning, organization, planning, problem solving, attention, concentration)
- Sensation (touch, taste, and smell, as well as our ability to withstand multiple sensory inputs—bright lights, noisy backgrounds, a lot of visual stimuli)
- Language (communication, including expressive and receptive language—taking in and understanding information and conveying information, and understanding)
- Emotional & Behavioral (depression, anxiety, personality changes, aggression, acting out, and social inappropriateness)

There are many factors that contribute to how brain injury will affect an individual, including the severity of injury, type of injury, age at the time of injury, location of the injury, personality of the individual prior to the injury, and the supports (both emotional and financial) available to that individual at the time of injury. For some, the injury will impact mobility and language in such a way that it is obvious to those around them, and impairs their ability to live independently in an obvious matter. For example, they may need assistance with bathing, dressing, eating and getting around—requiring the use of a mobility device and/or communication device. For others, the injury will impact cognition and thinking, along with emotions, and it will not be obvious to others how the injury is affecting them, however it still may affect their ability to live independently. For example, they may have difficulty completing schoolwork, finding and/or maintaining a job, managing day to day household tasks, such as paying bills, maintaining a schedule, keeping up with mail, developing and/or maintaining relationships and/or cooking meals.

Brain injury is often referred to as the “silent epidemic” because it occurs more commonly than the general public is aware of, and is under recognized and under identified among the general public, professionals and sometimes even the medical community. It can also be invisible to the human eye, as symptoms can often be subtle and not obviously apparent. For this reason, the Brain Injury Alliance of Connecticut strives to raise awareness about the effects of brain injury on individuals and their families, as well as the prevention of brain injury.

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Mild brain injury & concussions

Approximately 75% of all brain injuries that occur each year are ‘mild’, commonly called concussions.
A ***concussion*** is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. A concussion doesn’t always show up on brain imaging, such as a CT scan or MRI. This is because a concussive type of injury has more to do with metabolic and chemical changes in the brain than a visible physical or functional change.

Immediate signs and symptoms of a concussion can include:

- Confusion or feeling foggy
- Dizzy or lightheaded
- Loss of balance
- Disoriented to time and place
- Glassy-eyed or blurred vision, as well as double vision
- Slurred speech
- Loss of consciousness, although it is important to keep in mind that 90% of concussions have no loss of consciousness

Ongoing symptoms of concussion can include:

- Headache—a symptom reported in 70% of those with concussion
- Nausea or vomiting
- Sensitivity light or sound
- Difficulty focusing or concentrating
- Slower processing speed and reaction time
- Irritability, anxiety and depression

Rest is the key component in recovery from concussion, including physical rest and cognitive rest. Just as you would rest a sprained ankle your brain also needs rest. A graduated return to play is considered best practice, along with a graduated return to learn.

Repeated concussions occurring over an extended period of time (i.e., months, years) can result in cumulative neurological and cognitive deficits. Multiple concussions occurring within a short period of time (i.e., hours, days, or weeks) can be catastrophic or fatal. Second impact syndrome, considered an adolescent phenomenon, can occur when a second concussion occurs when the prior concussion is not fully healed. The consequences of second impact syndrome are lifelong disability or death.

It is also important to note that protective devices, such as helmets, headbands, and mouth guards, cannot prevent a concussion. While a helmet can prevent serious injury, including skull fractures, they cannot prevent your brain from moving inside your skull when an impact occurs.

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How common is brain injury?

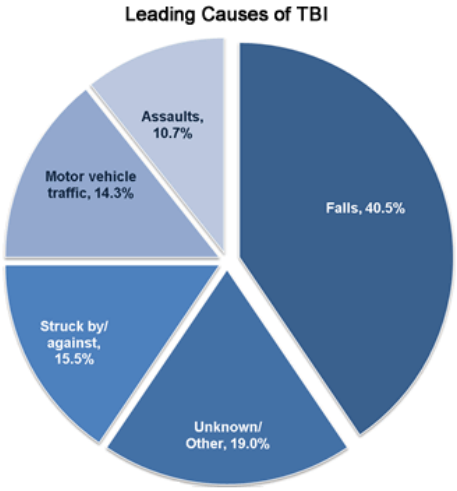
In 2010, about 2.5 million emergency department (ED) visits, hospitalizations, or deaths were associated with TBI either alone or in combination with other injuries—in the US. Males are 1 1/2 times more likely to sustain a TBI than females. TBI contributed to the deaths of more than 50,000 people, and TBI was a diagnosis in more than 280,000 hospitalizations and 2.2 million ED visits. These consisted of' TBI alone or TBI in combination with other injuries. In CT, there are over 36,000 hospital ED visits and hospitalizations annually for TBI-related injuries.

It is important to note that statistics on brain injury do not include acquired brain injury. Additionally, the Centers for Disease Control—which collects TBI statistics at a national level—acknowledges that data has not had sufficient sample sizes to produce reliable yearly estimates, does not include those seeking care at physician's offices, urgent care centers or other non-emergency outpatient departments, and that TBI incidence estimates are likely under counted.

Leading causes of brain injury

Among non-fatal TBI-related injuries for 2006–2010:

- **Assaults were the leading cause of TBI-related ED visits for persons 15 to 24 years of age.**
- Falls were the leading cause of TBI-related ED visits for all but one age group.



The leading cause of TBI-related **hospitalizations** varied by age:

- Falls were the leading cause among children ages 0-14 and adults 45 years and older.
- **Motor vehicle crashes were the leading cause of hospitalizations for adolescents and persons ages 15-44 years.**

The leading cause of TBI-related **death** varied by age.

- Falls were the leading cause of death for persons 65 years or older.
- **Motor vehicle crashes were the leading cause for children and young adults ages 5-24 years.**
- Assaults were the leading cause for children ages 0-4.

Among TBI-related deaths in 2006–2010:

- **Men were nearly three times as likely to die as women.**
- Rates were highest for persons 65 years and older.

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How can brain injury be prevented?

In Connecticut alone there are approximately 36,000 deaths, emergency department visits and hospitalizations that result from traumatic brain injury (TBI) each year. TBI is also considered the leading cause of death and disability in children and adolescents. To help lower your chances of getting a concussion or other serious brain injury, make a conscious effort to stay safe and protect your brain.

* **Buckle Up:** Despite the fact that wearing a seat belt increases your risk of surviving a crash by 75%, teens buckle up far less frequently than adults. Buckling up in the backseat is just as important, as unbelted passengers continue to move at the speed of the vehicle they are riding in until they hit something. In CT you are required to wear your seat belt in the back seat up to age 17, but encouraged to always wear your seatbelt, no matter where you are sitting. Remember that air bags were never intended to replace seat belts, but to work together to protect drivers and passengers.

* **Just Drive:** 10% of all drivers ages 15-19 years involved in fatal crashes were reported as distracted at the time of injury, and using a cell phone while driving quadruples the risk of getting into a crash. Drivers looking out the windshield can ***miss seeing up to 50%*** of what's around them when talking on any kind of a cell phone, including hands free. Recent studies have shown that there is no significant difference in hand-held and hands free cell phones, which is why it is best to let all calls, texts and notices wait. Plus, if you're a teen in CT and get caught using your hand-held cell phone 3 times you will be facing of a 6 month license suspension, and $175 fine to restore your license. Distractions while driving can be visual, manual or cognitive, so put down the phone, the food, the brush or whatever else is distracting you and JUST DRIVE!

* **Graduated Driving License (GDL):** The human brain continues to develop until age 25, and recent studies found that the portion of the brain that assesses risk and danger does not full develop until the mid-20s. The GDL is a period of supervised driving before getting a basic driver license that introduces driving privileges in stages – providing an opportunity to gain experience and practice. Since 2004, Connecticut has seen an 84% drop in teen driver fatalities due to the GDL. Learn more about and encourage the GDL in your family.

* **Safe Cycling:** Always wear a helmet, and encourage each family member to wear a helmet—regardless of their age. In Connecticut, anyone 15 years of age or younger must wear a bike helmet, but remember that the risk of brain injury does not reduce on your 16th birthday. Also, replace your helmet after every crash!

* **Walk This Way:** A teen pedestrian is injured or killed after being struck by a car every hour in the US. Discourage distracted walking, always cross at corners, stop on the curb and look both ways, and **make eye contact with the driver** (never assume they see you).

* **Don't Play Games with Concussions:** Teens who continue to play after experiencing a concussion, or return to play before their brain is fully healed, have a greater chance of getting another concussion. In 2010, CT established a law to protect student athletes by raising awareness about concussion, and the importance of identifying, treating and managing a concussion properly. Sports are an important way to stay healthy and recognize the importance of teamwork and collaboration.

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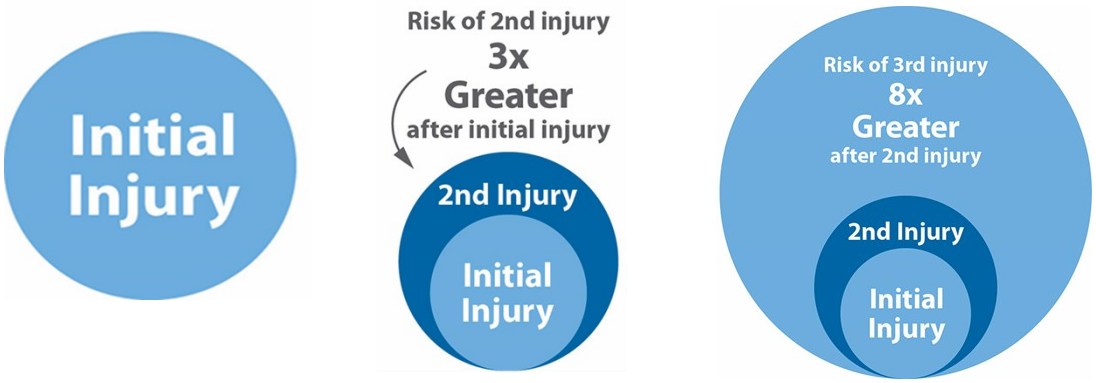
Did you know?

When someone has an injury to the brain, they are even more at risk for additional TBI's – there are several reasons for this including slower response time after the 1st injury, lack of awareness of environmental cues and unsafe situations, and decreased ability for problem solving and judgement for safe behavior after 1st injury. After the 1st brain injury, the risk for a 2nd injury is 3X greater AND after the 2nd TBI, the risk for a 3rd injury is 8X greater!



Protect Your Brain

The Protect Your Brain toolkit for high schools was developed by the Brain Injury Alliance of Connecticut to raise awareness about brain injury and the prevention of brain injury.

To learn more, go to www.biact.org/protectyourbrain

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Brain Injury 101

Pre- & Post-Test

1. How confident are you…

	Not confident at all	Somewhat confident	Reasonably confident	Very confident
That you can describe what a brain injury is	☐	☐	☐	☐
That you can list at least 5 ways to prevent brain injury	☐	☐	☐	☐
That you understand what a concussion is	☐	☐	☐	☐
That you know when the human brain is fully developed	☐	☐	☐	☐

2. How can an individual sustain a brain injury?
    a. As the result of a motor vehicle crash
    b. As the result of an infection
    c. As the result of a loss of oxygen
    d. As the result of a brain tumor
    e. All of the above

3. The brain is responsible for controlling our:
    a. Movement
    b. Short-term memory
    c. Personality
    d. Thinking
    e. All of the above

4. The age group with the lowest rate of seat belt use is:
    a. 20-24
    b. 16-20
    c. 30-34
    d. 40-44

5. It is much safer to drive while talking on a hands-free device than a hand-held one.
    a. True
    b. False

6. 10% of all drivers ages 15-19 years of age involved in fatal crashes were reported as distracted at the time of the crashes.
    a. True
    b. False

7. Following an initial brain injury, the risk of 2nd injury grows to:
    a. 1 time
    b. 2 times
    c. 3 times
    d. 4 times

8. CT law requires anyone under the age of __ to wear a helmet when riding a bike.
    a. 13
    b. 14
    c. 15
    d. 16

9. You have to hit your head to get a concussion?
    a) True
    b) False

10. You had to have lost consciousness to be diagnosed with a concussion?
    c) True
    a) False

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Brain Injury 101

Pre- & Post-Test – Answer Key

1. How confident are you…

	Not confident at all	Somewhat confident	Reasonably confident	Very confident
That you can describe what a brain injury is	☐	☐	☐	☐
That you can list at least 5 ways to prevent brain injury	☐	☐	☐	☐
That you understand what a concussion is	☐	☐	☐	☐
That you know when the human brain is fully developed	☐	☐	☐	☐

2. How can an individual sustain a brain injury?
    a. As the result of a motor vehicle crash
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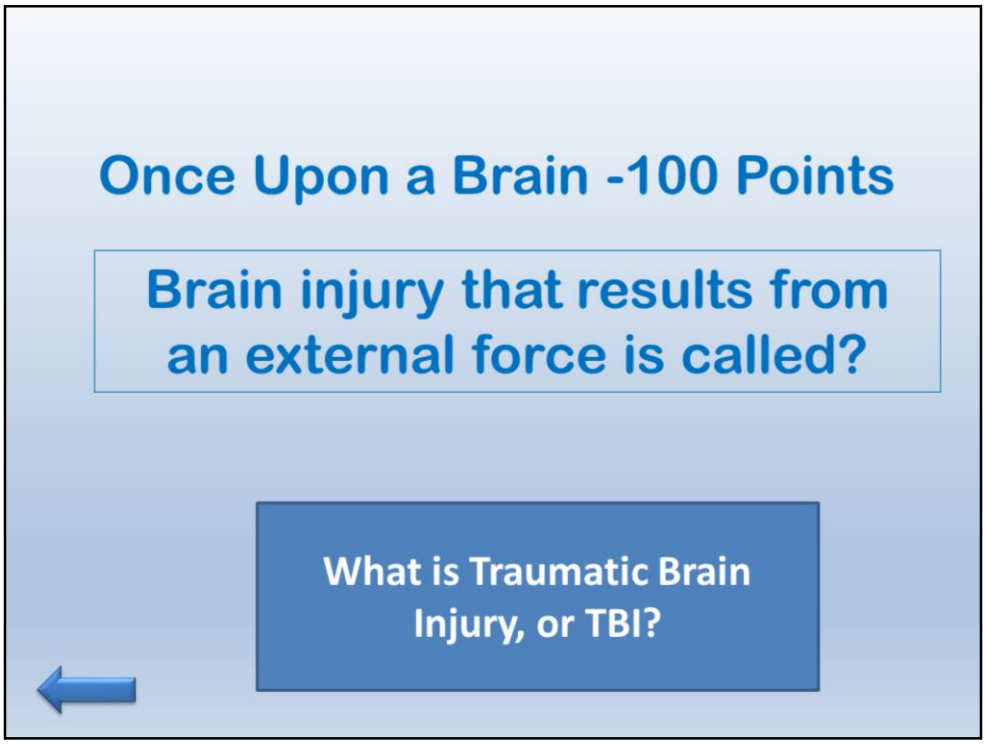
9. You have to hit your head to get a concussion?
    a) True
    b) False

10. You had to have lost consciousness to be diagnosed with a concussion?
    c) True
    a) False

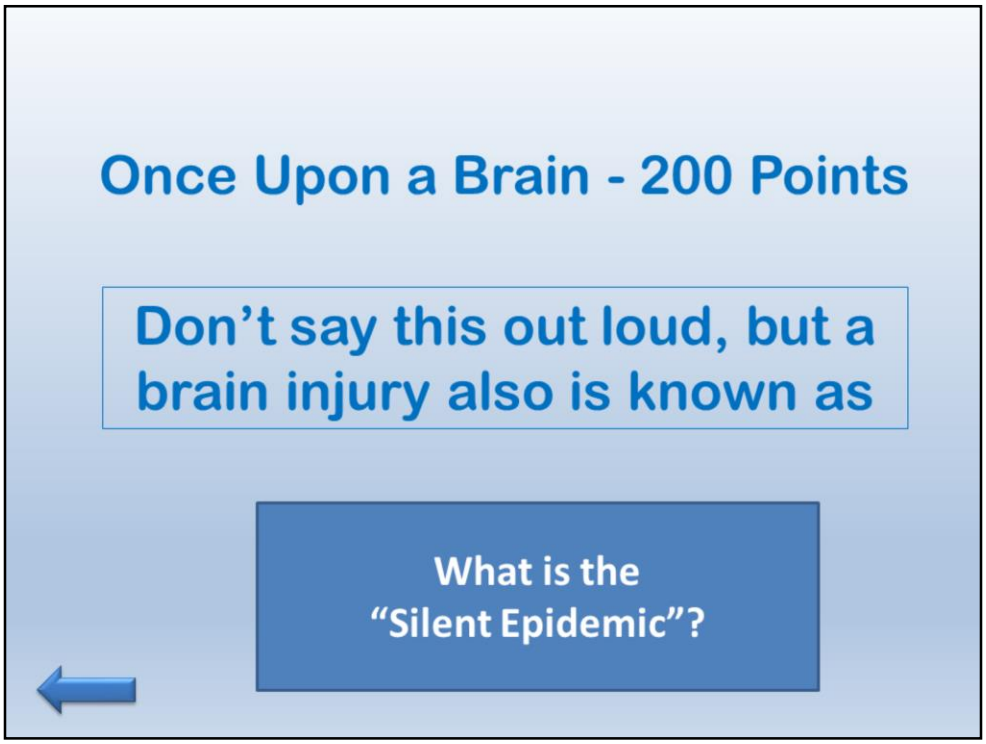
Note to presenter: Make sure you have administered the Brain Injury 101 pre-test as a means to measure the student's knowledge, and then have the students read Brain Injury 101 Reading Assignment, as the information covered in the reading assignment is covered in the Brain Injury 101 game. Once that is done, you can then prepare to play the game. *Presenter:* Assign a scorekeeper or assign yourself as the scorekeeper—whichever will be easier for you. You will also be the "host" of the game—presenting the questions and answers. The presentation includes speaker notes to go along with each question and answer. You can also opt to assign a student as the "host" if you choose. You know your students best. Break students into teams that will compete in the game. You can choose as many teams as you like, depending upon the size of the group and the amount of time you have to devote to the game. Ask each group to choose a Team Captain who will be responsible for conferring with his team before providing the final answer for their team. Let the game begin! Since you will be playing in teams, you will need to veer from the typical Jeopardy style of buzzing in when you know the answer. Instead Team A will begin by choosing a category and amount. For example, Once Upon a Brain for 100. You will also need to keep a copy of Slide 1 handy to keep track of the questions already asked. Each Team Captain will consult with their team for a maximum of 30 seconds to decide on their final answer. Once their final answer is provided let them know if they are correct or incorrect, and let them know what is in the speaker's notes so that they can better understand the answer. Following the first question, it would then be Team B's chance to choose, followed by Team C and so on. Once all the categories have been cleared allow the scorekeeper to tally the results and announce the winner. You can determine the "prize" for the winning team. They can simply have bragging rights or a night off from homework. Again, your know your students best. Following the game, make sure to administer the Brain Injury 101 post-test as a means to measure the students' knowledge after the reading assignment and game are complete. Remember that the goal is to raise awareness of brain injury and the prevention of brain injury, with the ultimate goal of keeping our students safe well into adulthood. Also, HAVE FUN!

Speaking Notes: Now that you have completed the pre-test and reading assignment we are ready to play Brain Injury 101. We have broken into our teams, and you have chosen your Team Captain, who will be responsible for providing your final answer. Team A will get to choose first, and can pick any category and amount. Our scorekeeper will keep track of the team scores, as well as the questions that have already been asked. You will have 30 seconds to confer with your team and provide a final answer. Following the first question, it will be Team B's chance to choose, followed by Team C and so on. Once the board has been cleared we will tally the results and announce a winner. The "prize" for the winning team will be (a night off from homework, bragging rights, etc.). So, let's get started. Team A, what do you choose to get started?

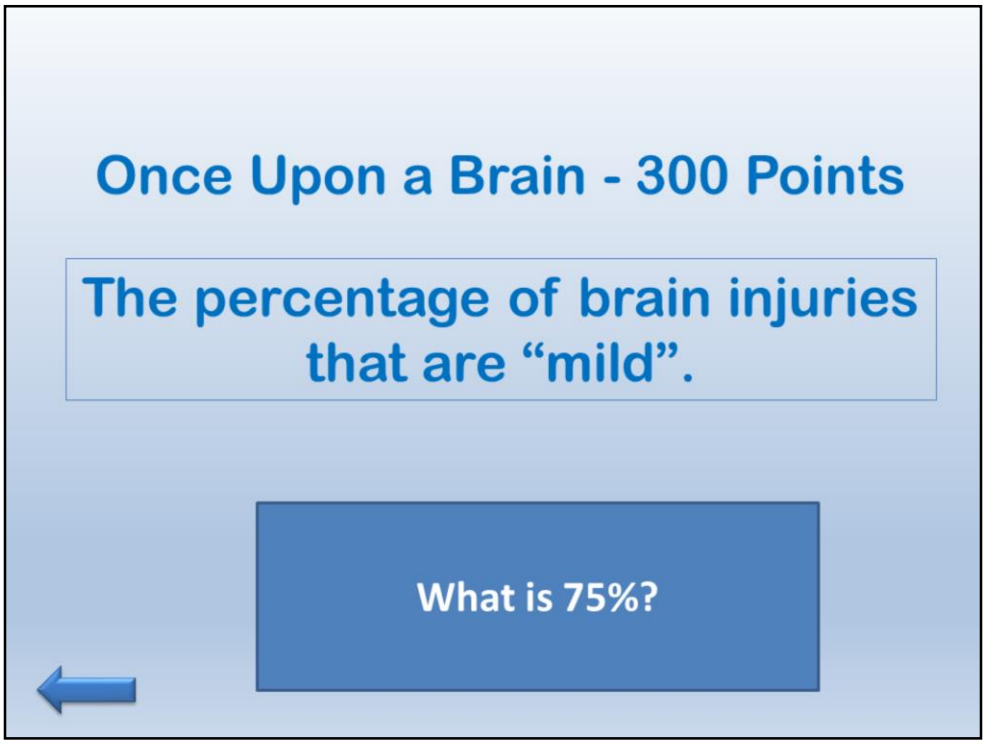


The answer is Traumatic Brain Injury, or TBI. As you learned in your reading assignment, brain injury is defined as either an Acquired Brain Injury (ABI) or Traumatic Brain Injury (TBI). An Acquired Brain Injury is any injury to the brain occurring after birth which is not hereditary, congenital or degenerative. Causes of acquired brain injury can include, but are not limited to the following: strokes, traumatic brain injury (TBI), substance abuse/overdose, hypoxia and anoxia (oxygen deprivation to brain) which can be caused by near drowning, suffocation/choking, heart attack, difficulty during surgery, toxic exposures, infections, such as encephalitis and meningitis, seizures and brain tumors. A Traumatic Brain Injury or TBI is an injury to the brain caused by a blow or jolt to the head or body, or a penetrating head injury that disrupts brain function. Causes of traumatic brain injury can include, but are not limited to the following: falls, motor vehicle crashes, struck by/against events (unintentionally), assaults, gunshot wounds, sports injuries, blast injuries and other injuries caused by trauma.

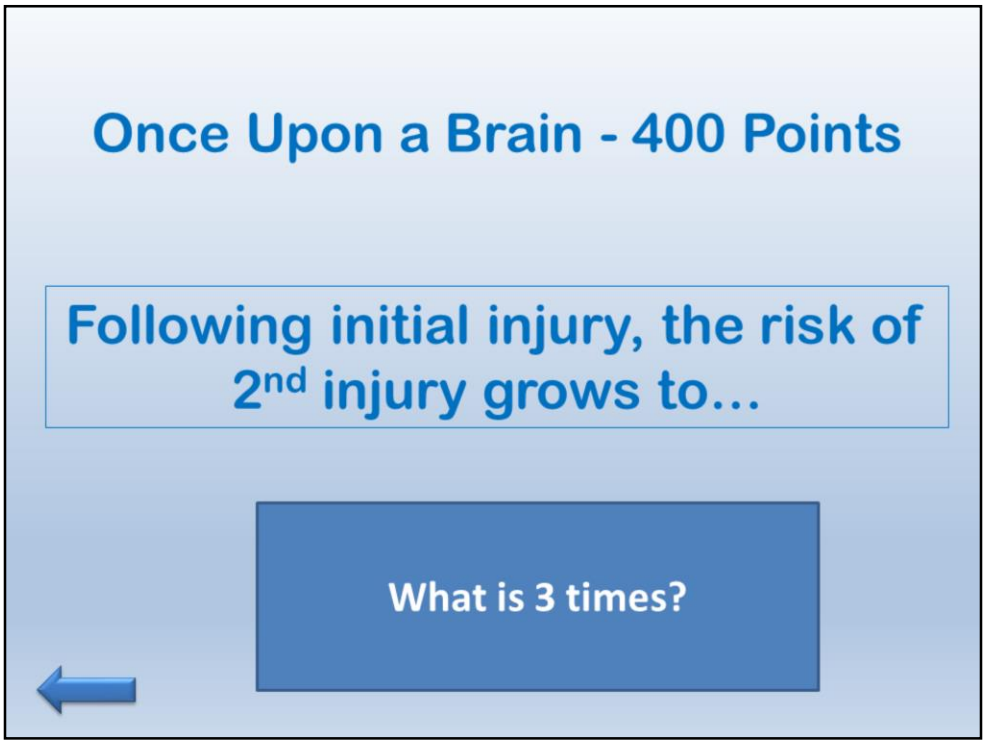
Prior to the reading assignment, you may have thought that you didn't know anyone with a brain injury, but now that you know the causes you may know someone who has experienced a concussion, or stroke, or heart attack that resulted in loss of oxygen to the brain. Brain injury is more common than you think, with an average of over 36,000 hospital emergency room visits and hospitalizations occurring annually in Connecticut each year.



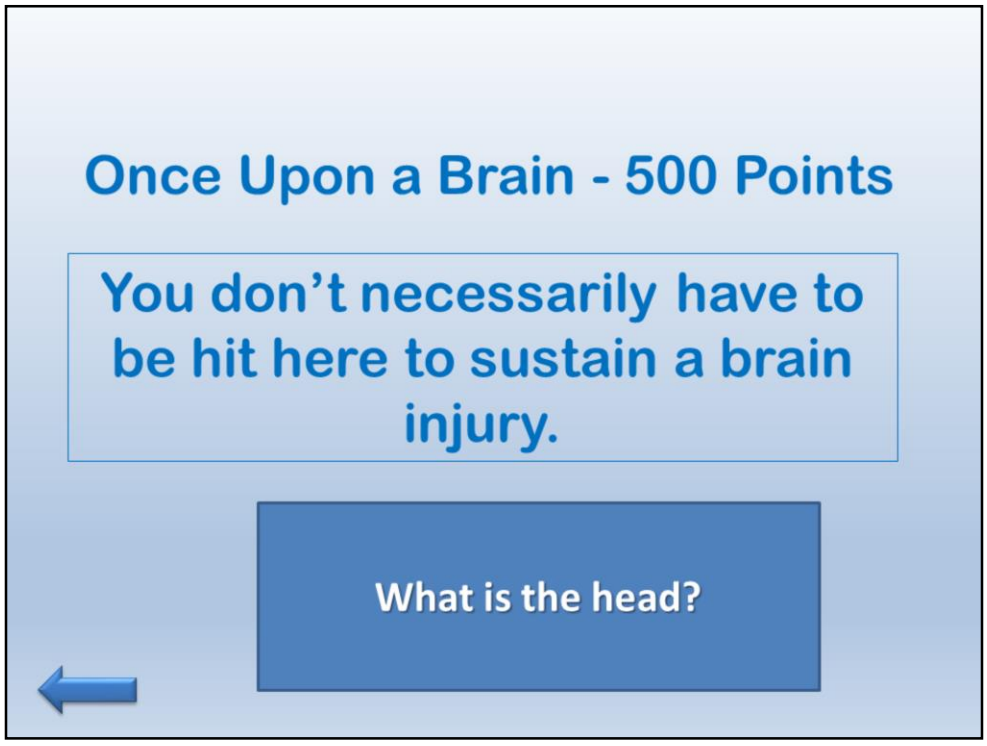
The answer is the "Silent Epidemic." Brain injury is often referred to as the "silent epidemic" because it occurs more commonly than the general public is aware of, and is under recognized and under identified among the general public, professionals and sometimes even the medical community. It can also be invisible to the human eye, as symptoms can often be subtle and not obviously apparent.



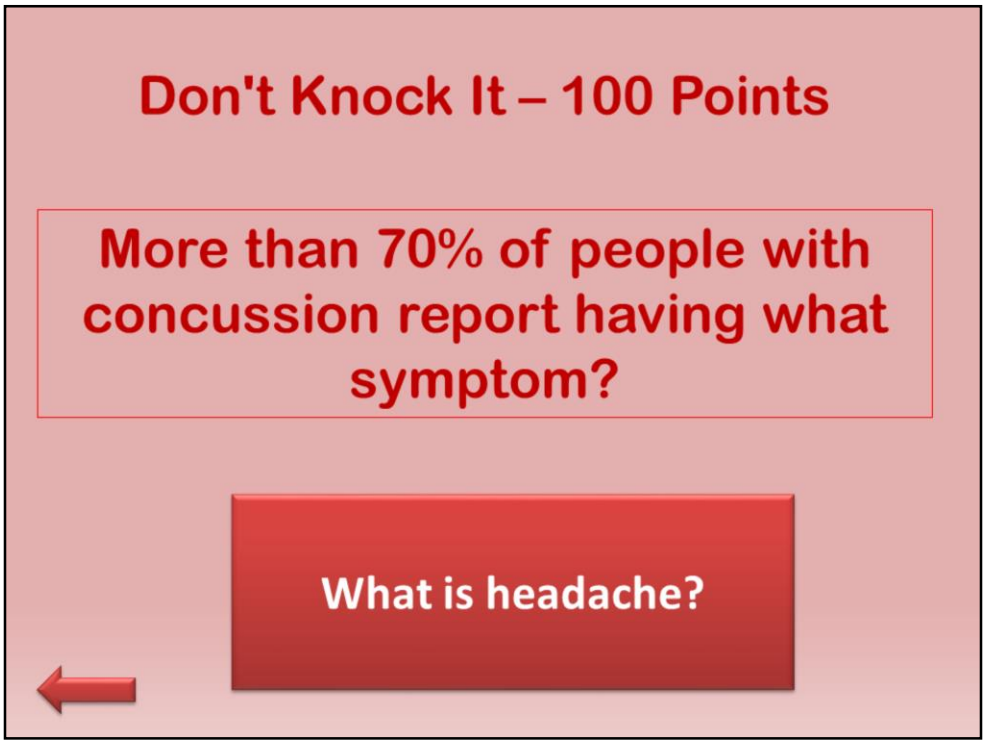
The answer is 75%. A concussion is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. A concussion doesn’t always show up on brain imaging, such as a CT scan or MRI. This is because a concussive type of injury has more to do with metabolic and chemical changes in the brain than a visible physical or functional change.



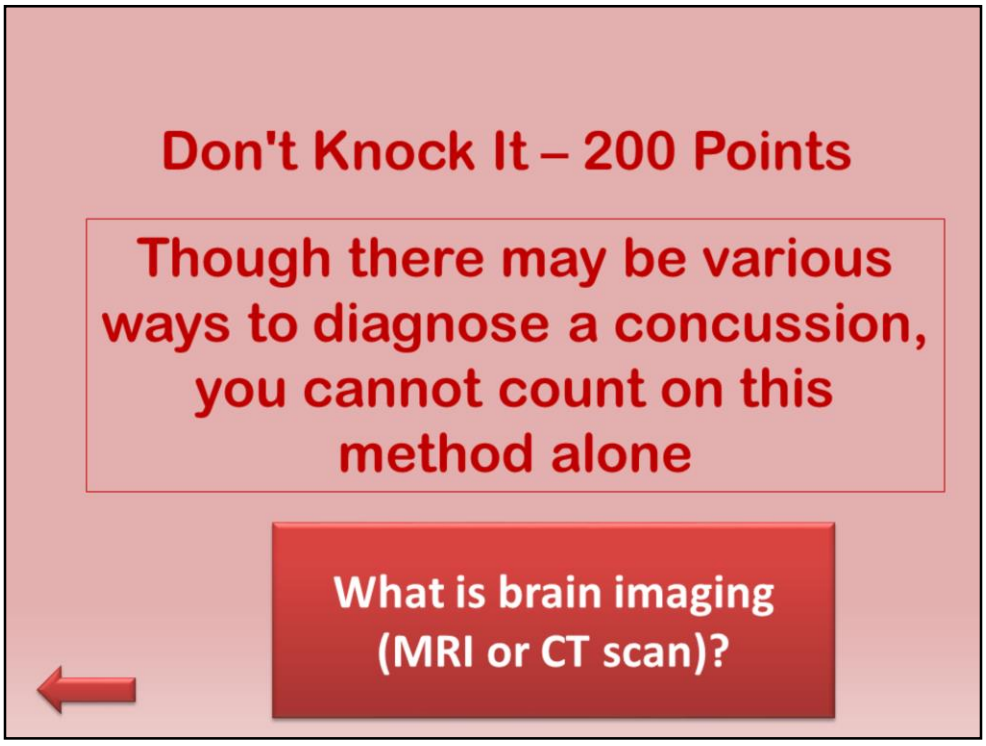
The answer is 3 times. When someone has an injury to the brain, they are even more at risk for additional TBI's – there are several reasons for this including slower response time after the 1st injury, lack of awareness of environmental cues and unsafe situations, and decreased ability for problem solving and judgement for safe behavior after 1st injury. After the 1st brain injury, the risk for a 2nd injury is 3X greater AND after the 2nd TBI, the risk for a 3rd injury is 8X greater!



The answer is the head. A concussion is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. While the skull is a rounded layer of bone designed to protect the brain from penetrating injuries, the base of the skull is rough, with many bony protuberances. These ridges can result in injury to the temporal and frontal lobes of the brain during rapid acceleration. As an example, a driver in a motor vehicle crash may avoid hitting their head on the steering wheel, dashboard and windshield because of the protection the air bag provides, but may still experience a brain injury as a result of the rapid acceleration and deceleration the brain experiences as a result of the crash. Or when playing sports, you do not need to hit your head to sustain a concussion. For example, if a player is running and collides with another player, but does not hit their head, they can still sustain a concussion from the rapid acceleration and sudden deceleration caused by the collision.

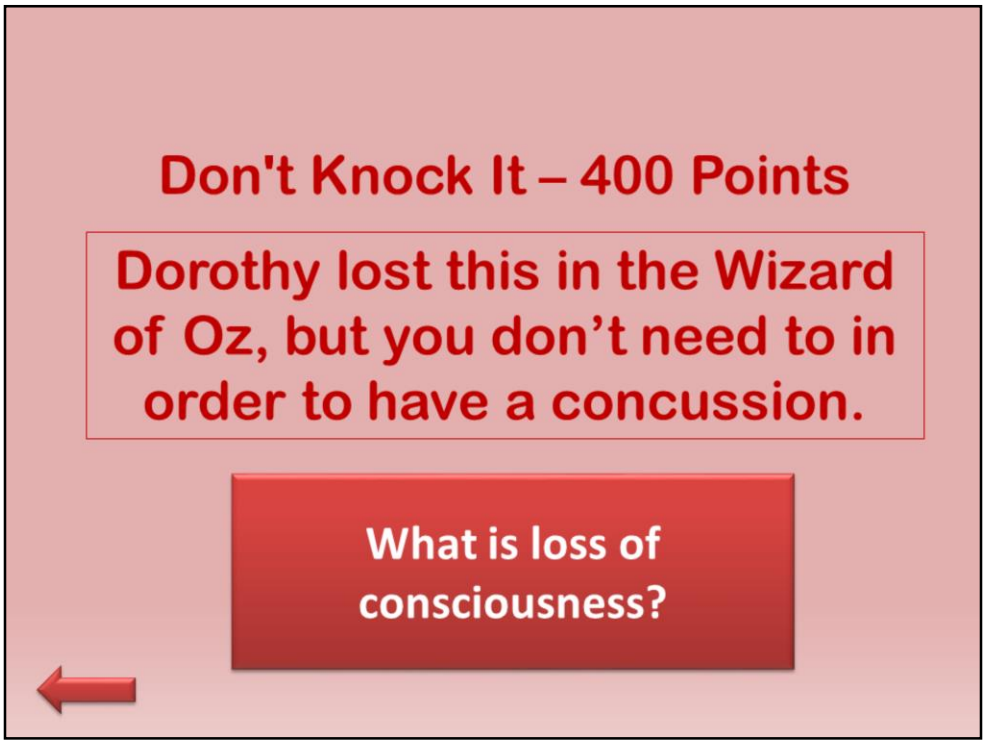


The answer is headache, which is the most reported symptom for those experiencing concussion. Additional ongoing symptoms of concussion can include: Nausea or vomiting; Sensitivity light or sound; Difficulty focusing or concentrating; Slower processing speed and reaction time; and Irritability, anxiety and depression.

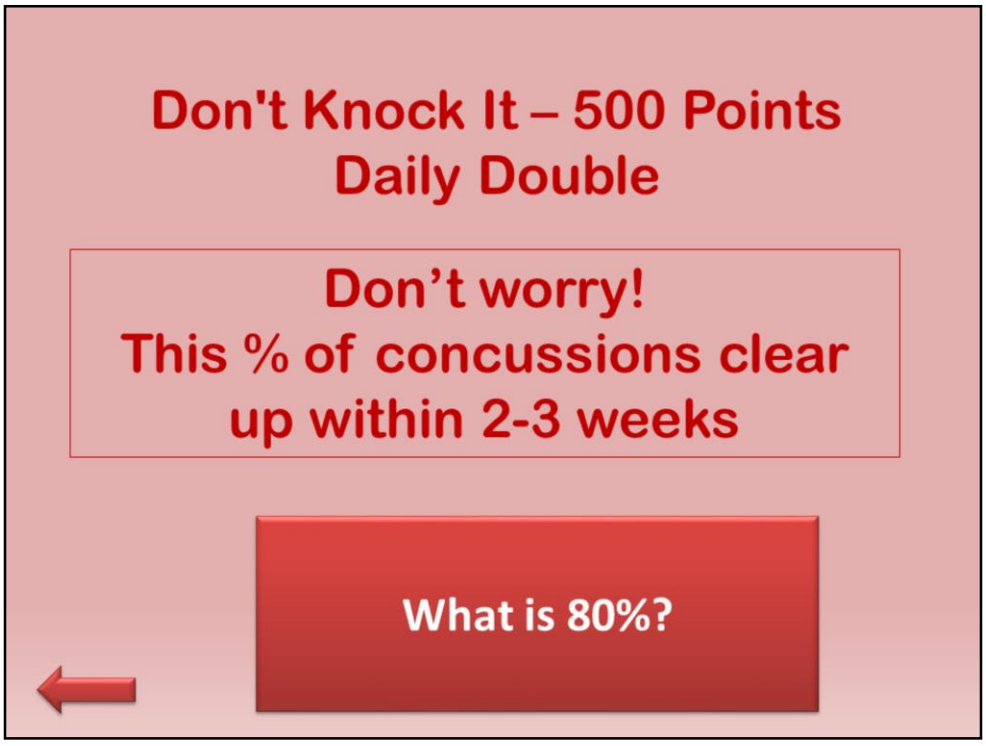


The answer is brain injury – which can be done through a CT scan or MRI. This is because a concussive type of injury has more to do with metabolic and chemical changes in the brain than a visible physical or functional change.

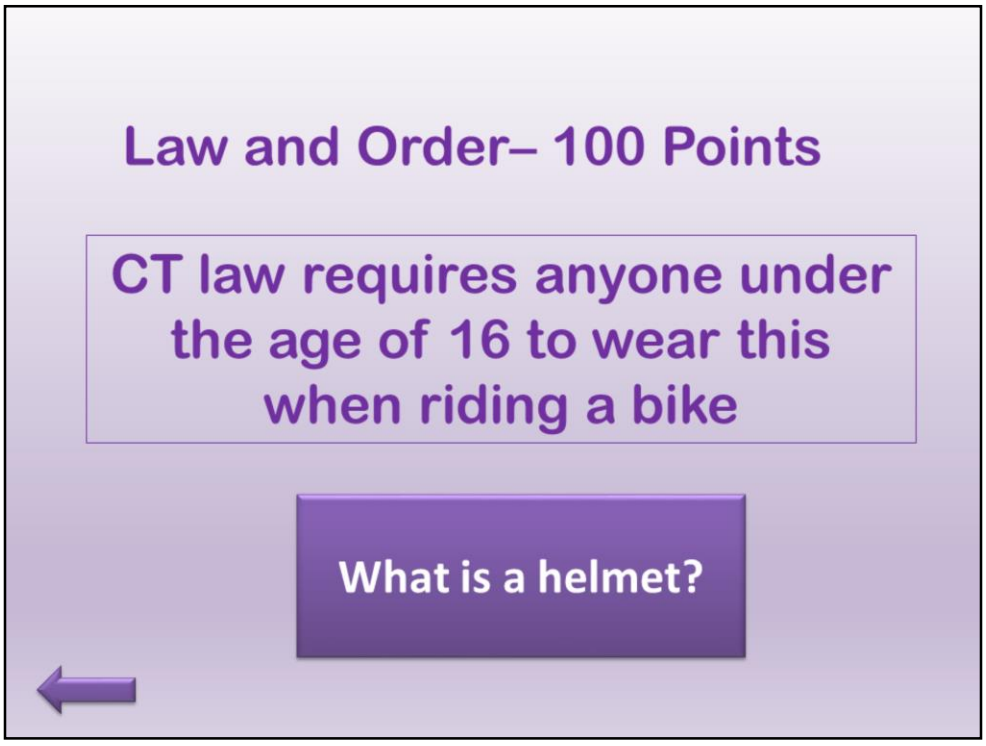
The answer is rest. Rest is the key component in recovery from concussion, including physical rest and cognitive rest. Just as you would rest a sprained ankle your brain also needs rest. A graduated return to play is considered best practice, along with a graduated return to learn.



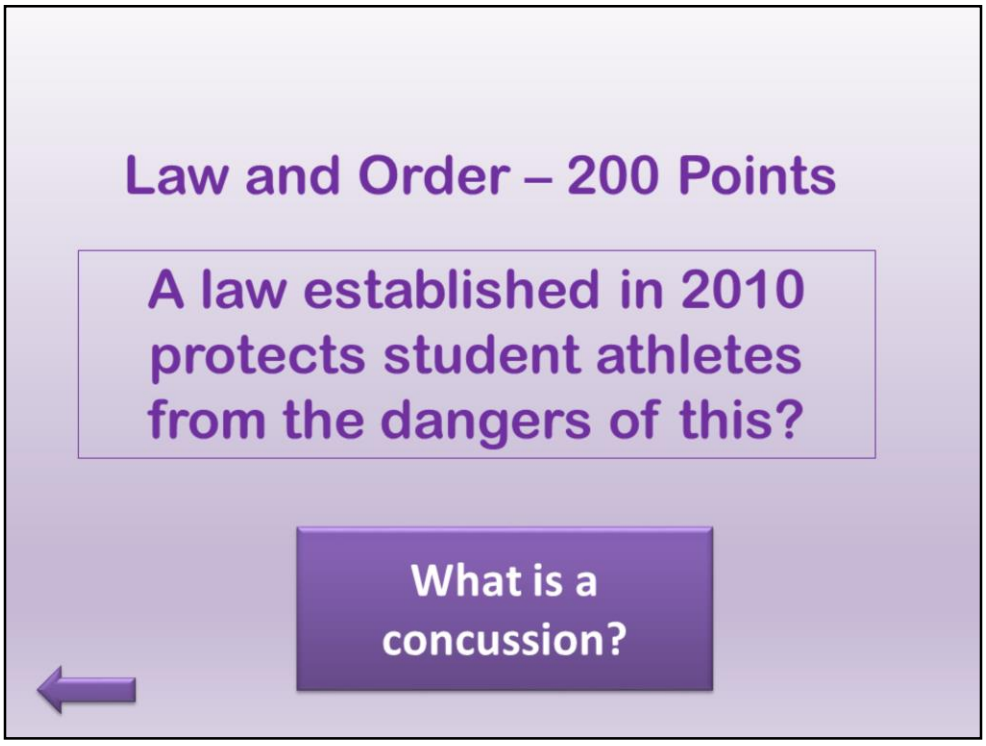
The answer is loss of consciousness. While loss of consciousness can be a sign or symptom of concussion it is important to keep in mind that 90% of concussions have no loss of consciousness.



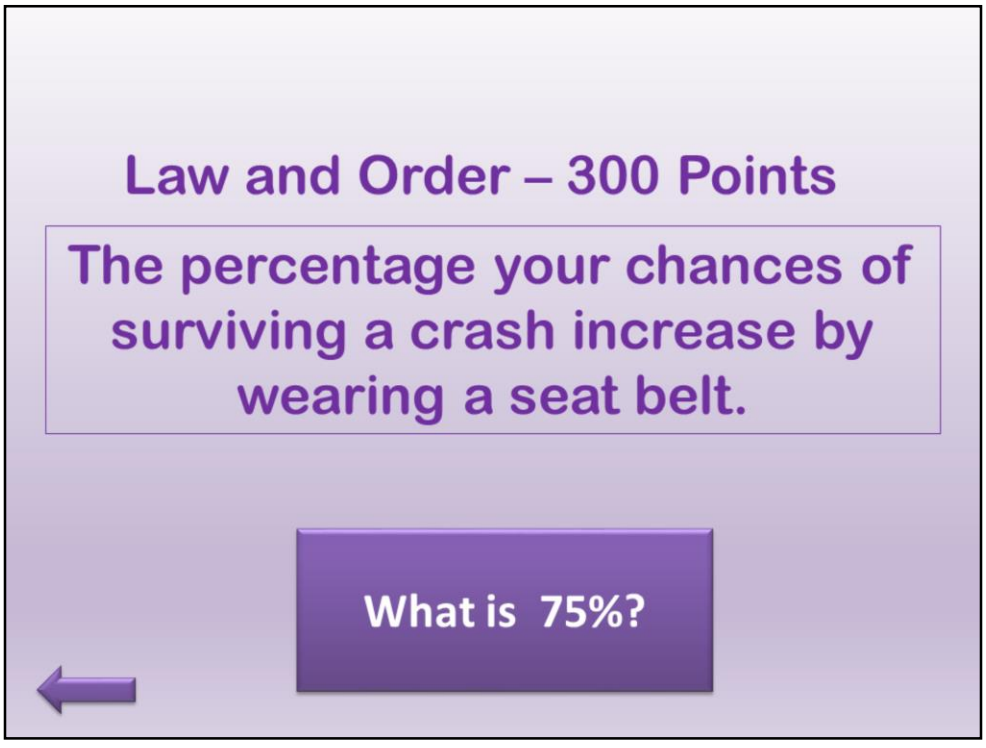
The answer is 80%. While up to 80% of mild brain injuries, such as concussions, can resolve in 2-3 weeks, some mild and more severe brain injuries usually have lifelong consequences that affect an individual on a day to day basis. It is important to keep in mind that children and adolescents take longer to recover than adults, and should be monitored carefully while recovering, with a graduated return to learn and return to play. Symptoms may last for closer to 3 weeks in children & adolescents.



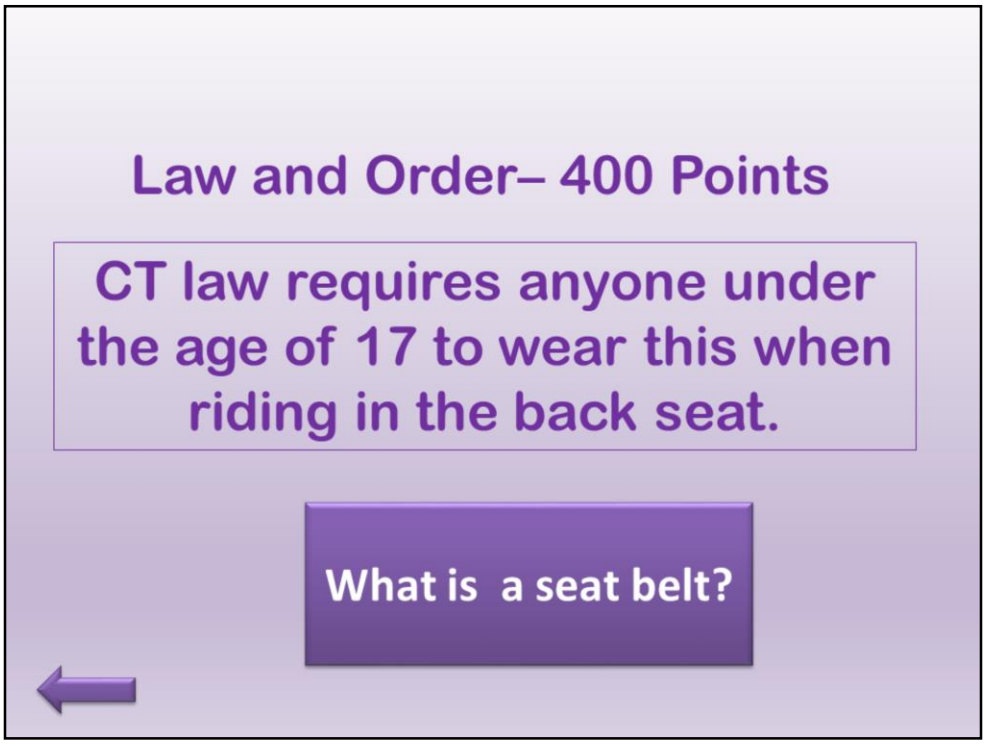
The answer is a helmet. In Connecticut, anyone 15 years of age or younger must wear a bike helmet, but remember that the risk of brain injury does not reduce on your 16th birthday. Also, replace your helmet after every crash!



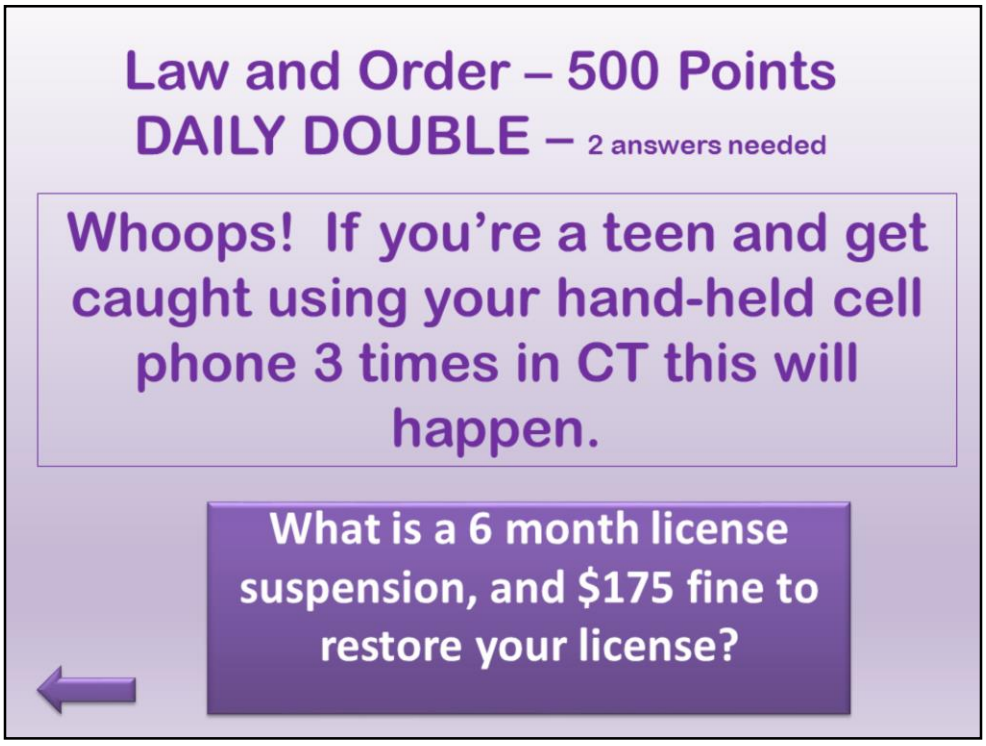
The answer is concussion. Teens who continue to play after experiencing a concussion, or return to play before their brain is fully healed, have a greater chance of getting another concussion. In 2010, CT established a law to protect student athletes by raising awareness about concussion, and the importance of identifying, treating and managing a concussion properly. Sports are an important way to stay healthy and recognize the importance of teamwork and collaboration. In the long run, learning more about concussion and the proper management of concussion allows student athletes to remain involved with sports and stay healthy.



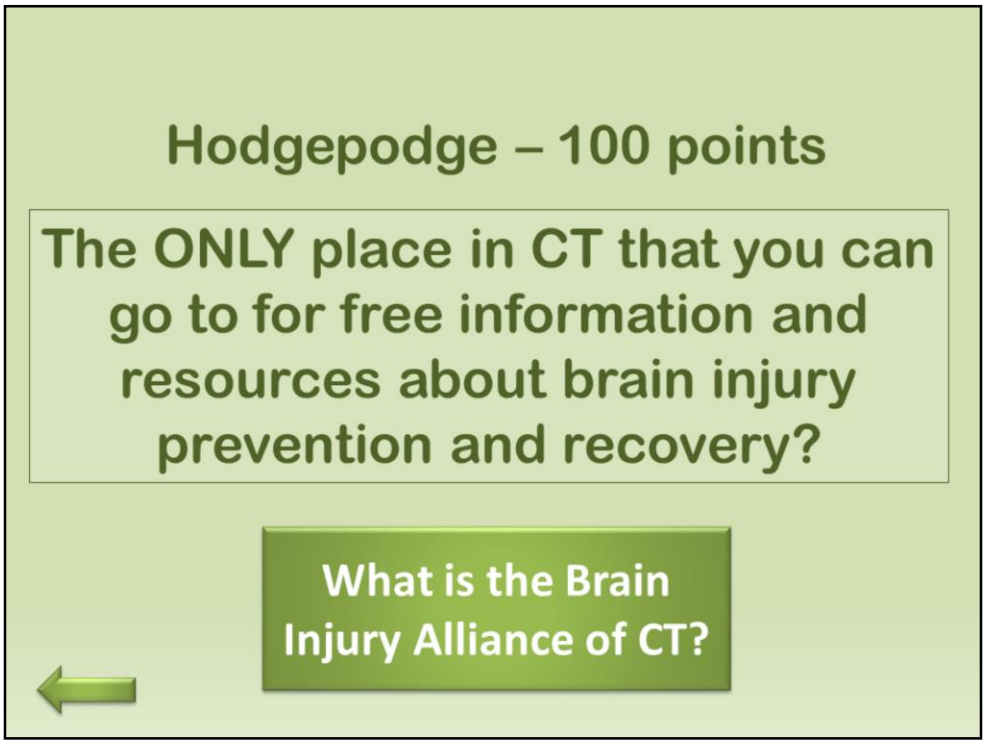
The answer is 75%. Despite the fact that wearing a seat belt increases your risk of surviving a crash by 75%, teens buckle up far less frequently than adults. Remember that air bags were never intended to replace seat belts, but to work together to protect drivers and passengers.



The answer is a seat belt. Buckling up in the backseat is just as important, as unbelted passengers continue to move at the speed of the vehicle they are riding in until they hit something. In CT you are required to wear your seat belt in the back seat up to age 17, but encouraged to always wear your seatbelt, no matter where you are sitting

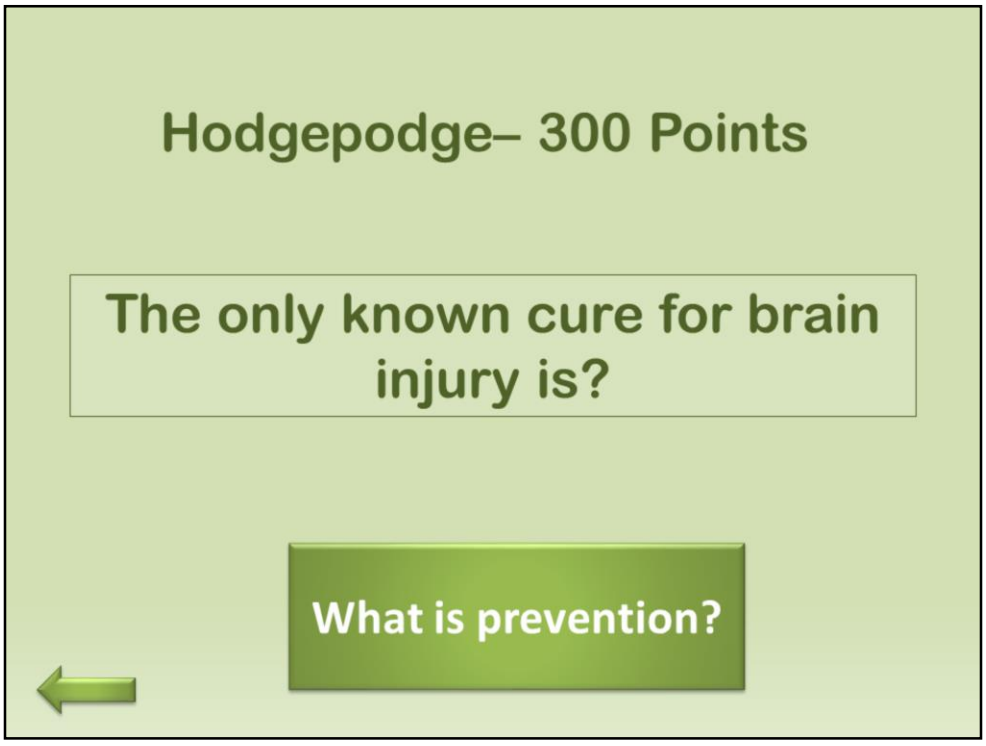


The answers are a 6 month license suspension, and $175 fine to restore your license. 10% of all drivers ages 15-19 years involved in fatal crashes were reported as distracted at the time of injury, and using a cell phone while driving doubles the risk of getting into a crash. It is also important to keep in mind that distractions while driving can be visual, manual or cognitive, so put down the phone, the food, the brush or whatever else is distracting you and JUST DRIVE!

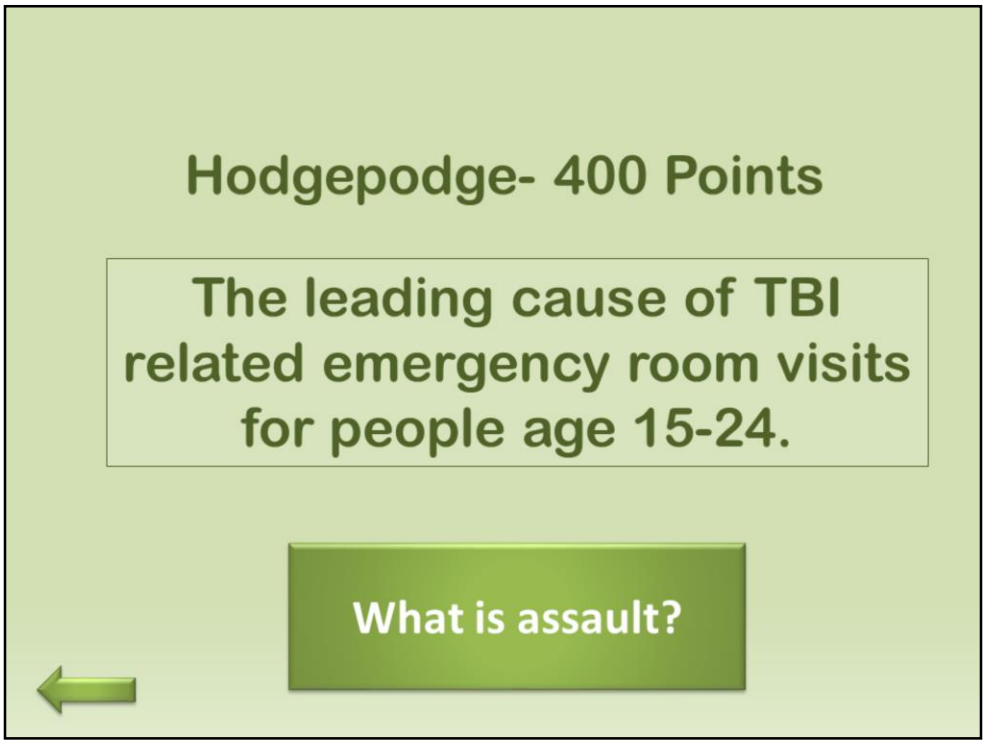


The answer is the Brain Injury Alliance of CT, which developed this tool kit for preventing brain injury. The Brain Injury Alliance of Connecticut has been Connecticut's partner in brain injury prevention & recovery for more than 30 years, providing free information and resources about brain injury prevention and rehabilitation.

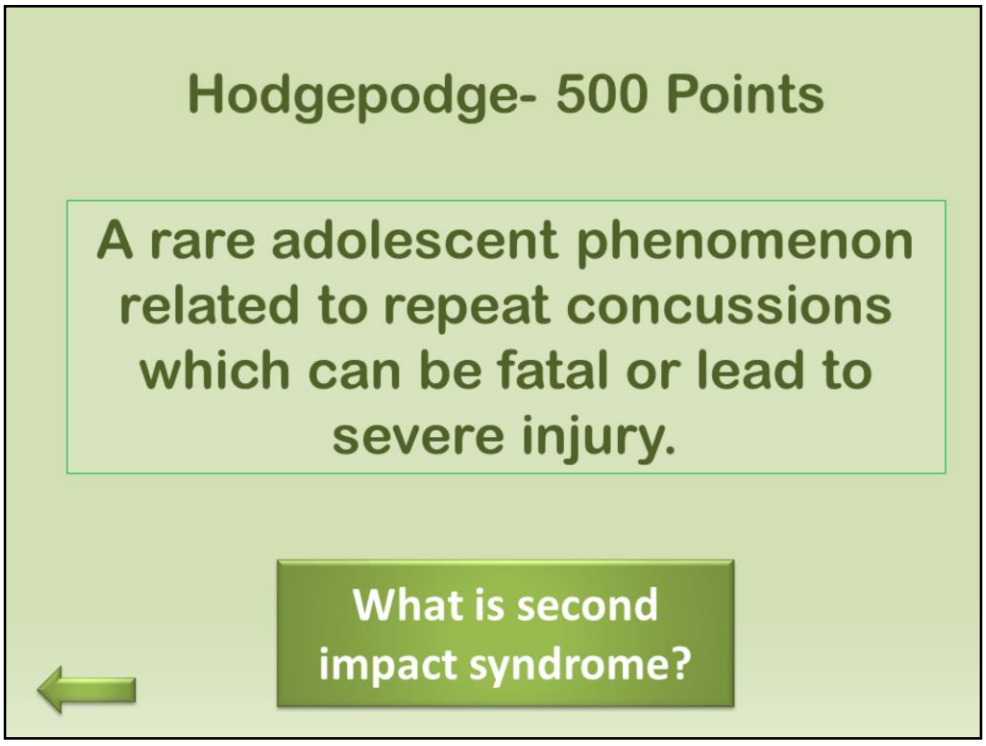
The answer is helmets, mouth guards and headbands. While wearing a helmet may minimize severity of injury AND skull fractures, it will not prevent the brain from moving around inside the skull. Mouth guards and headbands will also not prevent concussion, as they are unable to prevent the brain from moving around inside the skull.



The answer is prevention. TBI is considered the leading cause of death and disability in children and adolescents, and the key to stemming the tide is prevention. To help lower your chances of getting a concussion or other serious brain injury, make a conscious effort to stay safe and protect your brain.

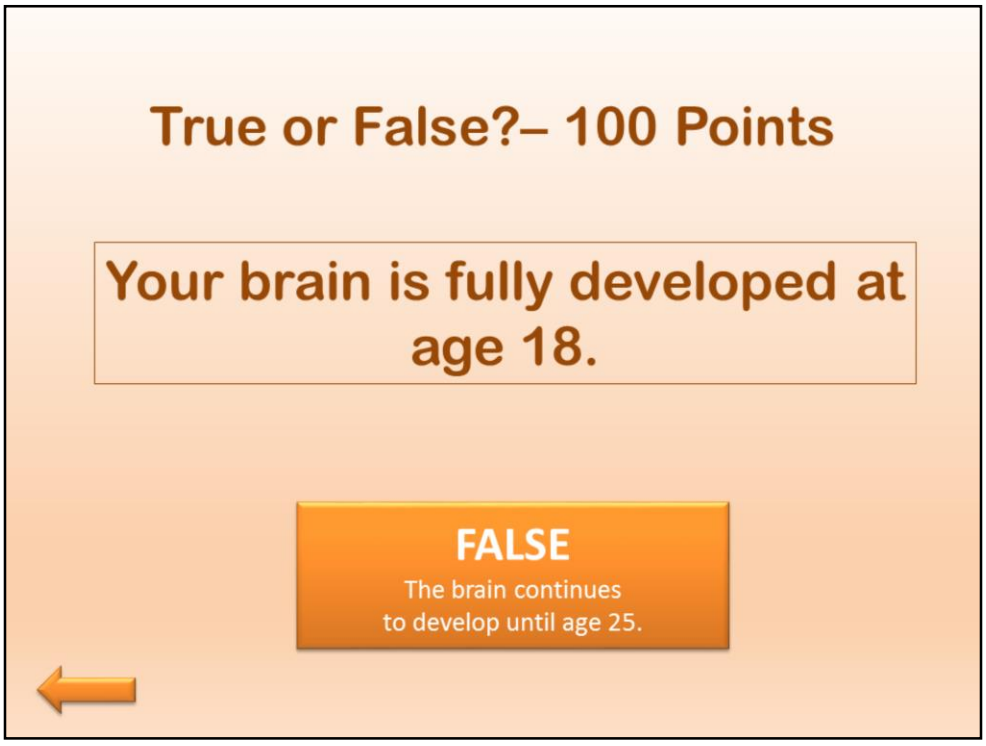


The answer is assault. While it is not the leading cause of hospitalizations for this age group, it is the leading case of ER visits. Assaults can occur as a result of domestic violence between partners, as a result of abuse at the hands of a parent or caregiver, as the result of a stranger assaulting another individual without provocation (during a robbery) or among peers that begin fighting. Assaults that come in the form of abuse can be prevented by finding the support to help you get out of the situation, through a domestic violence shelter or trust friend, family member or professional. Assaults that occur among peers can be prevented by learning anger management skills and/or coping mechanisms to deal with stress and anger.

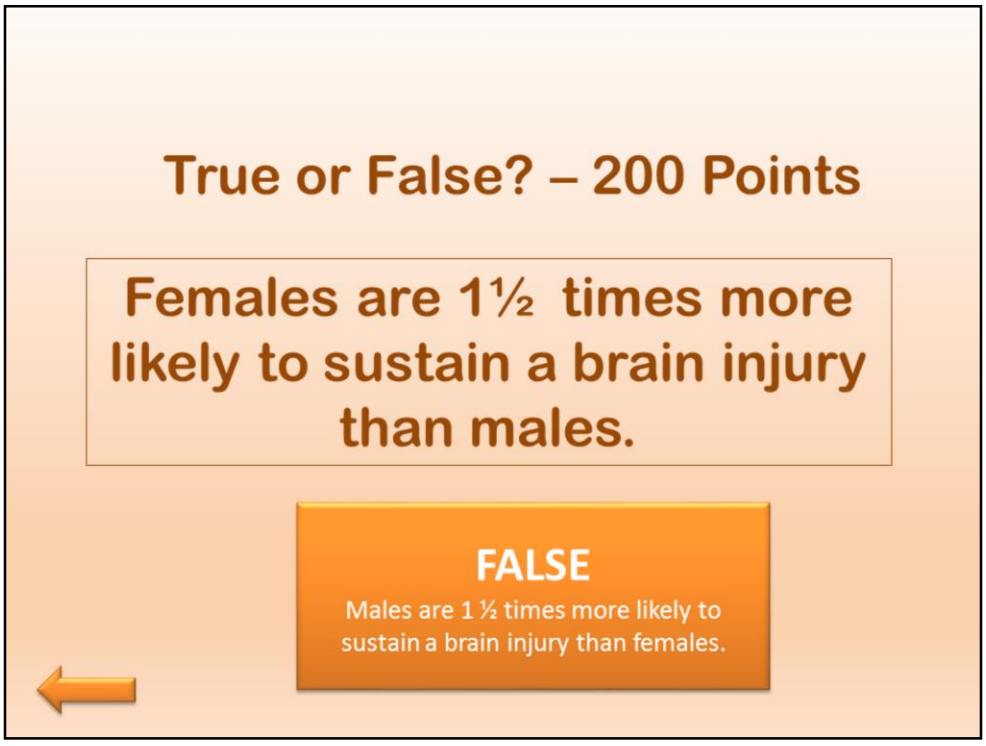


The answer is second impact syndrome. Repeated concussions occurring over an extended period of time (i.e., months, years) can result in cumulative neurological and cognitive deficits. Multiple concussions occurring within a short period of time (i.e., hours, days, or weeks) can be catastrophic or fatal. Second impact syndrome, considered an adolescent phenomenon, can occur when a second concussion occurs when the prior concussion is not fully healed. The consequences of second impact syndrome are lifelong disability or death.

In 2008, a high school football player in New Jersey, Ryne Dougherty, experienced Second Impact Syndrome. Ryne was still recovering from a previous concussion when he played in a football game for his high school. In the first quarter, Ryne was knocked on his back trying to make a tackle. On the ground, writhing in pain, he grabbed his head. Dazed, he was helped to his feet. He collapsed on the way to the sidelines and soon fell into a coma. Two days later, on October 18, 2008, he was taken off of life support and died in a hospital room. His brain was no longer functioning. While Second Impact Syndrome is rare, it is always a possibility when an athlete continues to play while having not fully healed from another concussion.

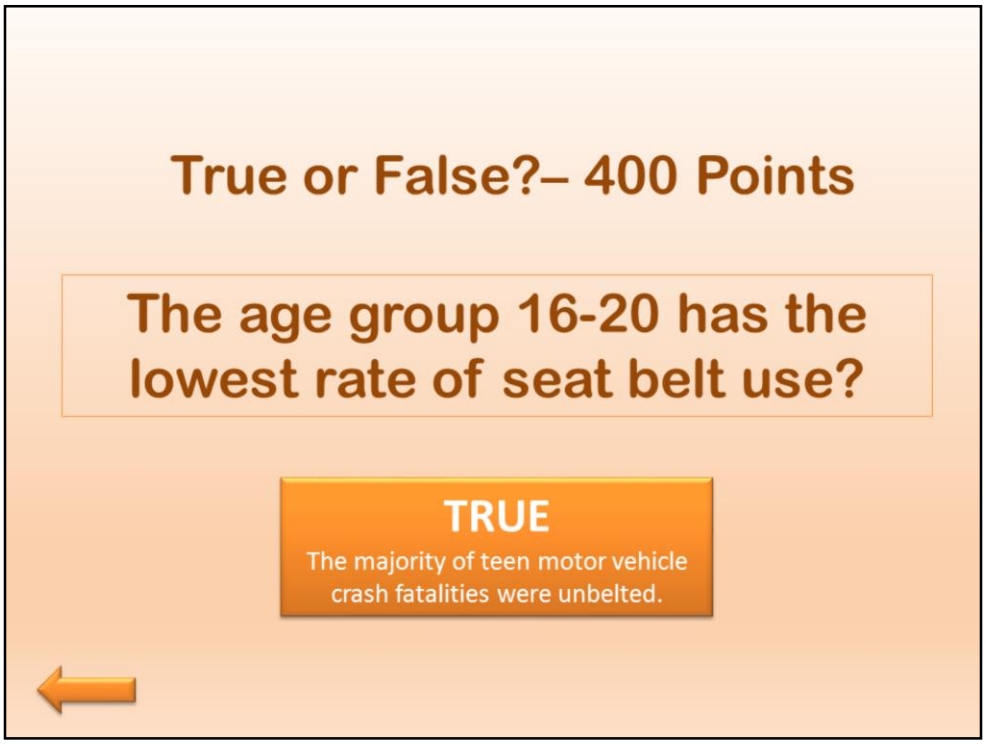


The statement is FALSE. The human brain continues to develop until age 25, and recent studies found that the portion of the brain that assesses risk and danger does not full develop until the mid-20s. For this reason, many states have implemented Graduated Driver's License programs for teen drivers. The GDL is a period of supervised driving before getting a basic driver license that introduces driving privileges in stages – providing an opportunity to gain experience and practice. Since 2004, Connecticut has seen an 84% drop in teen driver fatalities due to the GDL.

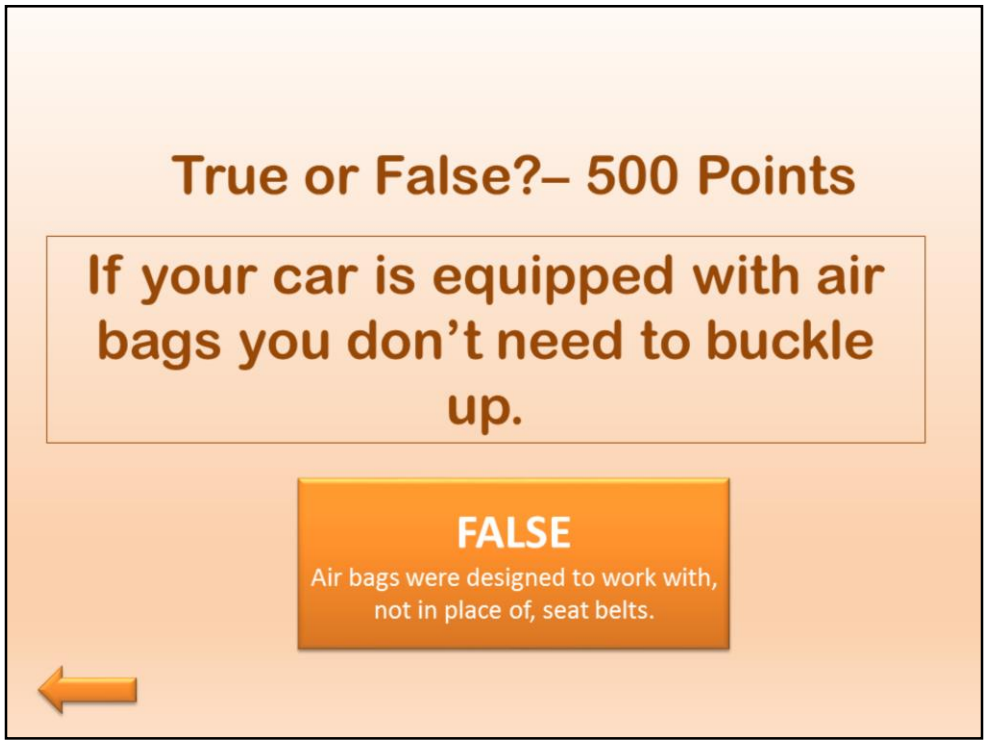


The statement is FALSE. Males are 1 ½ times more likely to sustain a brain injury than females. This could be due in part to males being more prone to risk taking behavior.

This statement is FALSE. You should replace your helmet after every crash, The foam part of a helmet is made for one-time use, and after crushing once it is no longer as protective as it was, even if it still looks intact. And the thin shells on most helmets now tend to hide any dents in the foam. But if you can see marks on the shell or measure any foam crush at all, replace the helmet. You can also crack the helmet foam or damage it by dropping the helmet on a hard surface. You may be reluctant to replace a helmet that looks almost as good as new, but if you did hit, you don't want to take chances on where you will hit next time. If the foam is cracked under the thin shell, it will be more likely to fly apart in your next crash.



This statement is TRUE. You're the generation that came home from hospital in car seats, you've ridden in seat belts your whole life and when you start to drive you take off your seat belts. According to the National Highway Traffic Safety Administration… Teens buckle up far less frequently than adults do. Despite efforts aimed at increasing belt use among teens, observed seat belt use among teens and young adults (16 to 24 years old) stood at 80 percent in 2008 – the lowest of any age group. In fact, in 2009 the majority (56%) of young people 16 to 20 years old involved in fatal crashes were unbuckled.



This statement is FALSE. Air bags are designed to work with seat belts, not replace them. Without a seat belt you could crash into the vehicle interior, other passengers, or be ejected from the vehicle. In virtually all circumstances, the chance of survival in a crash is much greater if the occupant is not ejected from the vehicle.

According to the Automotive Safety Council - Airbags and safety belts used together reduce the risk of serious and fatal injuries by 40 to 55 percent.

According to the Insurance Institute for Highway Safety - When all cars have airbags, it's estimated this combination can save nearly 11,000 lives per year. It is estimated that airbags have reduced head-on crash fatalities by up to 30 percent and moderate-to-severe injuries by 25 to 29 percent. Injury claims at hospitals resulting from traffic crashes have dropped 24 percent as a result of airbags.

According to the National Highway Traffic Safety Administration (NHTSA) about 20,000 front-seat passenger-car occupants are killed annually on U.S. roads as the result of car crashes. Another 300,000 suffer injuries serious enough to require hospital treatment.

This statement is TRUE. According to the National Highway Traffic Safety Administration, this age group has the largest proportion of drivers who were distracted at the time of the crashes. A 2015 Erie Insurance distracted driving survey reported that drivers do all sorts of dangerous things behind the wheel including brushing teeth and changing clothes. The survey also found that one-third of drivers admitted to texting while driving, and three-quarters saying they've seen others do it. (Erie Insurance survey) Distractions can be visual, manual and cognitive.

What does it mean to be 'Manually Distracted'? Give an example.

Answer: Taking your hands off the wheel to adjust the radio or GPS, talking on a hand-held cell phone, etc.

What does it mean to be 'Visually Distracted'? Give an example.

Answer: Taking your eyes off the road to text, checking an email, look at the GPS, checking the radio, etc.

What does it mean to be 'Cognitively Distracted'? Give an example.

Answer: Taking your attention off the road to talk on a cell phone, talking to a fellow passenger, disciplining the children in the back seat, etc.

This statement is FALSE. According to the National Safety Council…

The brain quickly toggles through things - but can't do two things at one time. The activity in the area of the brain that processes moving images decreases by up to 1/3 when listening to talking on the phone.

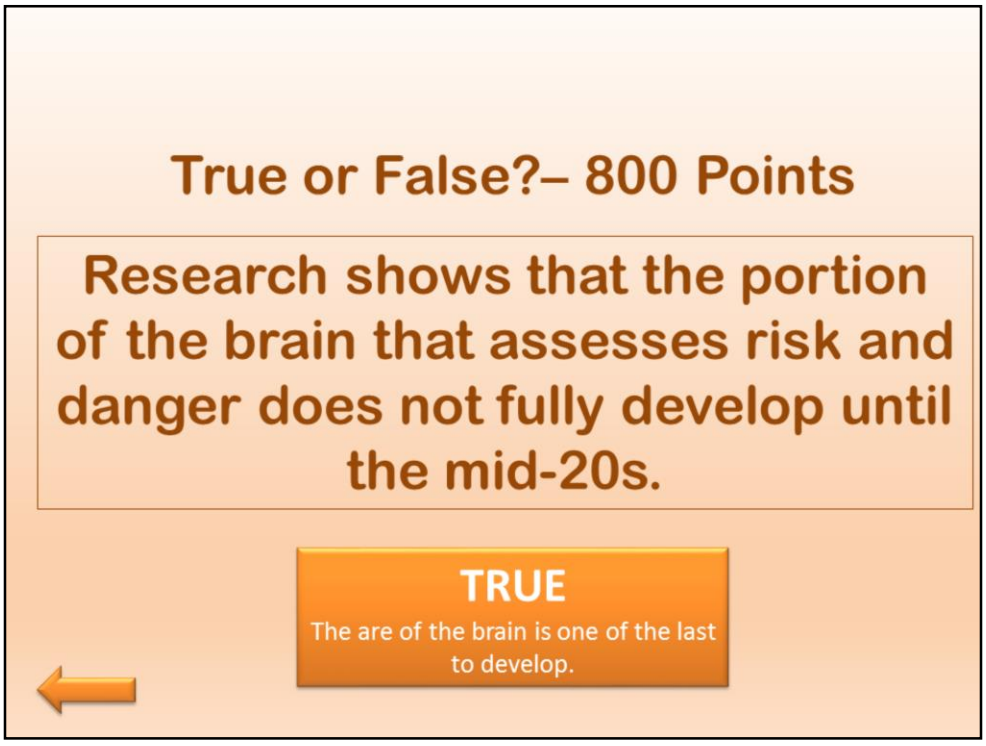
Drivers looking out the windshield can **miss seeing up to 50%** of what's around them when talking on any kind of a cell phone, including hands free.

New studies show using voice to text is more distracting than typing texts by hand.

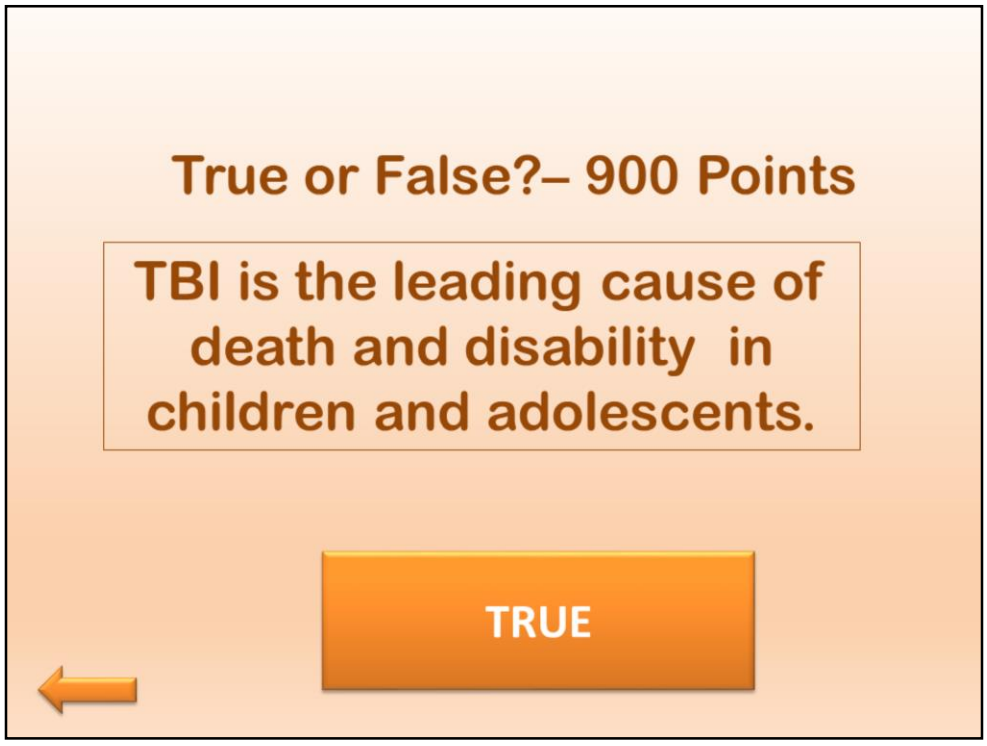
Isn't it just as distracting to talk to other passengers?? For adult drivers, NO! A passenger is able to spot and point out hazards, a passenger is another set of eyes, a passenger is able to recognize when traffic is challenging and stop talking.

There is not a significant difference in the # of injuries/deaths-they are both very dangerous!

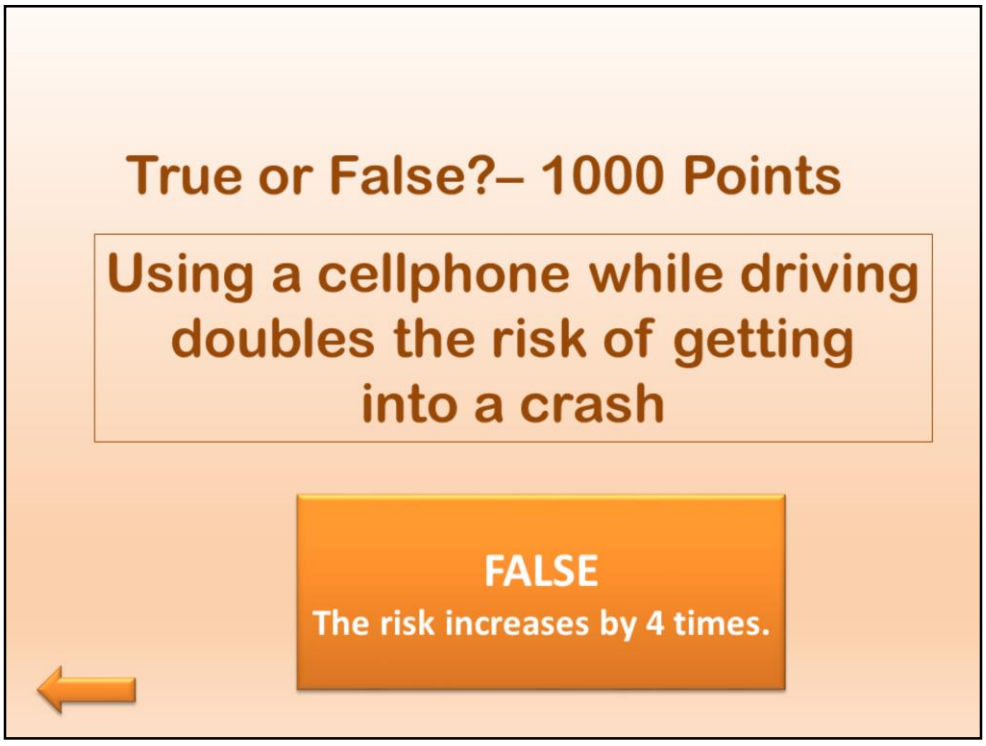
So far, the research indicates that the cognitive distraction of having a hands-free phone conversation causes drivers to miss the important visual and audio cues that would ordinarily help you avoid a crash.



A National Institutes of Health study suggests that the region of the brain that inhibits risky behavior is not fully formed until age 25. Brain signals essential for emotional maturity and motor skills are the last parts of the frontal lobe to develop. Although adults text more often than teens, it is teens who are in more distracted related crashes. Distracted driving is dangerous for everyone, but for teens it becomes even more dangerous when combined with a brain that is not fully developed.



This statement is TRUE. While the symptoms of a brain injury in children and adolescents are similar to the symptoms experienced by adults, the functional impact can be very different. The brain of a child and adolescent is continuing to develop through age 25. The assumption used to be a child or adolescent with a brain injury would recover better than an adult because there was more “plasticity” in a younger brain. More recent research has shown that this is not the case. A brain injury actually has a more devastating impact on a child or adolescent than an injury of the same severity has on a mature adult. The cognitive impairments of children and adolescents may not be immediately obvious after the injury but may become apparent as the child or adolescent gets older and faces increased cognitive and social expectations for new learning and more complex, socially appropriate behavior. These delayed effects can create lifetime challenges for living and learning for children and adolescents, their families, schools and communities. Some children may have lifelong physical challenges. However, the greatest challenges many children and adolescents with brain injury face are changes in their abilities to think and learn and to develop socially appropriate behaviors.



This statement is FALSE. A recent study by the Insurance Institute for Highway Safety found that drivers using phones are four times as likely to get into crashes serious enough to injure themselves. "The main finding of a fourfold increase in injury crash risk was consistent across groups of drivers," says Anne McCartt, Institute vice president for research and an author of the study. "Male and female drivers experienced about the same increase in risk from using a phone." The study also found the same increase regardless of whether the cellphone use that hand-held or hands-free.