



UNITED STATES
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USBIA NEWS Spring 2022

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Mark Your Calendars For These Upcoming USBIA Webinars!

Wednesday, August 10, 2022

Return to School Following Brain Injury: Promising Practices and Current Research

Presented by Melissa McCart, Research Assistant Professor and Director of the Oregon TBI Teams at the Center on Brain Injury Research and Training at the University of Oregon.

To register for this webinar, [click here](#).

Wednesday, November 9, 2022

The Use of Apps Within the Brain Injury Community

Presented by Michelle Wild, President/CEO of Brain Education Strategies and Technology, Inc.

To register for this webinar, [click here](#).

Bicycle Safety

Reprinted from CDC.gov

Bicycle trips make up only 1% of all trips in the United States.¹ However, bicyclists account for over 2% of people who die in a crash involving a motor vehicle on our nation's roads.²⁻³

Note that bicycle refers to bicyclists and other cyclists including riders of two-wheel, nonmotorized vehicles, tricycles, and unicycles powered only by pedals.

Thousands of bicyclists are injured or killed in the United States every year

Deaths and Injuries

Nearly 1,000 bicyclists die and over 130,000 are injured in crashes that occur on roads in the United States every year.³

Cost

The costs of bicycle injuries and deaths from crashes typically exceed \$23 billion in the United States each year.³ These costs include spending on health care and lost work productivity, as well as estimated costs for lost quality of life and lives lost.



Some groups are at higher risk for bicycle injuries and deaths

Risks vary by age and sex

- Adults ages 55-69 have the highest bicycle death rates.³
- Adolescents, teens, and young adults have the highest rates of bicycle-related injuries treated in emergency departments (EDs). People ages 10-24 account for nearly one-third of all bicycle-related injuries seen in US EDs.³

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Promising Interventions

Interventions that have shown promise for reducing injuries and fatalities to bicyclists include rider visibility and active lighting. For example:

- Fluorescent clothing can make bicyclists visible from further away than regular clothing during the daytime.⁷
- Retro-reflective clothing and materials on the bicycle can make bicyclists more visible at night.⁷
- Active lighting may improve the visibility of bicyclists and is required by law in most states when bicycles are ridden after dark.⁷ Active lighting includes front white lights, rear red lights, or other lighting on the bicycle or bicyclist.

Safer roads can save lives

Information about roadway engineering measures, like bike lanes, that can improve safety for bicyclists is available from the [Federal Highway Administration](#) and [The Pedestrian and Bicycle Information Center](#).

References

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4. Hoyer A. [Bicycle helmets – to wear or not to wear? A meta-analysis of the effects of bicycle helmets on injuries](#). *Accid Anal Prev* 2018;117:85-97.
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- Male bicyclists have death rates 6 times higher and injury rates 5 times higher than females.³

Additional risk factors

- Most bicyclist deaths occur in urban areas.²
- About 64% of bicyclist deaths occur on sections of roads away from intersections (where higher speeds might occur) and 27% occur at intersections.²
- About one-third of crashes that result in a bicyclist's death involve alcohol for the motor vehicle driver and/or bicyclist.²

Injuries and deaths among bicyclists are preventable

Effective Interventions

Effective interventions to reduce injuries and fatalities to bicyclists include the following:

Bicycle helmets

Bicycle helmets reduce the risk of head and brain injuries in the event of a crash.^{4,6} All bicyclists, regardless of age, can help protect themselves by wearing properly fitted bicycle helmets every time they ride.

Bicycle helmet laws

Bicycle helmet laws are effective for increasing helmet use and reducing crash-related injuries and deaths among children and adults.⁷

How Your Brain is Capable of More Than You Ever Imagined

By Special Guest Author Hannah Issacs

Reprinted with Permission from the Brain Injury Alliance of Arizona, The Noggin

We all know the old adage: You can't teach an old dog new tricks. In other words, as we get older, we are no longer able to learn new things or change. This belief has its root in the earliest understandings of brain development. It turns out though, there's less truth to this belief than we once thought.

Research in recent decades has shed more light on the inner workings of our brains. Doctors and scientists have found that our neural wiring is not set in stone. It's actually flexible—through changes in the environment and repeated exposure to new situations, our brains can change. The name for this ability for our brains to adjust is called neuroplasticity.

WHAT IS NEUROPLASTICITY?

Neuroplasticity is your brain's ability to form and reorganize neurons and connections between neurons. The most common times the brain changes are in response to an injury or learning something new. Our neural wiring changes, the chemical compounds sending messages through our neurons can change, and our brain can physically change as well depending on our environment and how we use our mind.

There are two primary forms of neuroplasticity:

1. Structural plasticity: when the brain changes its physical structure as a result of learning something new.
2. Functional plasticity: when the brain moves functions from a damaged area to an undamaged area.

The discovery of structural and functional neuroplasticity in the brain has broken many of the myths that once circulated regarding how our brains work.

3 BRAIN MYTHS PROVEN WRONG BY NEUROPLASTICITY

Brain myth #1: Genetics is everything

For a long time, the popular belief about how our brains work was that everything about our cognitive function was laid out at birth. Our genes determined for the rest of our lives how our brains would work.

However, it seems genetics aren't everything. Your brain is dynamic and responds to the environment, meaning what your brain is capable of is influenced by factors beyond your genetic code.

That's not to say that genetics doesn't play a role. As with everything, your genes provide the foundation for the functions of your body—and the same is true of rewiring potential. Recovery results from a brain injury can be influenced by genetic factors.

The whole picture is much bigger and more complex than genetics alone. Your environment and daily experiences can spark a change in your brain if you decide to learn something new or encounter new situations each day.

Brain myth #2: Your childhood environment is everything

While many people thought genetics determined everything about the brain, others believed what you experienced in childhood set certain neural pathways in stone. For decades, the popular belief was we are all born as a blank slate and our environment in childhood determines how we turn out. Therefore, upon leaving childhood, those habits, attitudes, beliefs, and dispositions once gained in childhood are part of you forever.



There is a reason many people believed this: in the first few years of life, there's rapid brain growth. At birth, each neuron has around 2,500 synapses. By three years old, those synapses have exploded to 15,000 per neuron. But by adulthood, those 15,000 synapses have been cut in half. This led many to believe the neuron wiring that strengthened in childhood would be kept forever.

While there is plenty of evidence that our younger years influence our way of thinking and choices well into adulthood, things aren't as permanent as once believed.

But just like in childhood, your brain continues to adapt to changing environments in adulthood. So, by learning new things or putting yourself in new situations, your brain develops new strong connections.

Brain myth #3: After a certain age, your brain cannot change anymore

While you can change your brain after childhood, there must be a time in adulthood when your brain cannot change anymore, right? It turns out that's not the case at all. Your brain continues to change as you age.

While it's true that changes can be more difficult, or that it may take more time to

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learn something for older adults compared to children or younger adults, the capacity for change is still there.

It has been shown in some research that people who experience a brain injury earlier in adulthood are able to recover better than those who have one as an older adult—even when the injury in the younger adult patients was more severe. But in one 2015 study involving older adults, it showed their brains can and do change with new experiences.

HOW YOUR BRAIN CHANGES

Our brains change imperceptibly as we grow. We can also make intentional changes to the wiring and functioning of our brain. It's miraculously malleable in a way that serves as both a caution and a hope for many.

But how does that change happen?

Changes in your brain occur as a result of a vast array of circumstances:

- Learning something new
- Stress
- Injury (like a concussion or stroke)
- Disease (like Alzheimer's)
- Meditation
- Exercise

Environments, situations, and lifestyle choices all influence the way the brain changes. Some changes happen imperceptibly over time, while others abruptly result from an injury. There are also changes that come from intentional practice like learning a language or meditation.

Although all people's brains can be influenced by these factors, no two people who want to change the way their brain is wired will have the exact same experience. As a result, there is no single "best" way to enhance your brain function. The changes in your brain depend on a range of factors like your age, gender, health history, existing psychological factors, and physical activity. This is also true for those who have faced traumatic brain injuries.

One example of this in action was a study done in 2019. Researchers used music therapy for patients who had experienced a brain injury to see how learning an instrument would impact their recovery.

They selected music therapy because playing an instrument has some important benefits for your brain:

1. Promotes an interaction between both hemispheres and may strengthen connections between neural networks.
2. Activates areas of the brain involved in episodic memory (remembering personal experience) and semantic memory (remembering meaning and knowledge about the world).
3. Strengthens new neural connections through repetition.
4. Provides an enriched environment for the brain that helps neurons build more and stronger connections.

At the start of the study, the participants reported regularly feeling fatigue, blurred vision, light sensitivity, dizziness, vertigo, sensitivity to sound, headaches, increased irritability, and mood changes.

During the study, the participants received two 30-minute piano lessons each week, for 8 weeks. In addition, they practiced at home for at least 15 minutes a day.

By the end of the study, 85% of the participants reported improvement of their cognitive performance and in their mental capacity. They also cited experiencing fewer instances of the negative side effects that resulted from their brain injury.

The results of the study hold a lot of promise for current and future treatment for brain injury to reduce side effects like fatigue, mood changes, and increased irritability, as well as improve cognitive function over time.

If you have had a brain injury and are working on rebuilding neural pathways and promoting new learning in your brain, here are some ways to stimulate brain health so you can continue to grow and learn new things:

Exercise: It is always important to follow your doctor's guidelines regarding exercise after a brain injury. Exercising too soon or too much following an injury can exacerbate an existing injury. But incorporating cardio into your routine when approved by your doctor will improve the oxygen flow to your brain and give it the energy it needs to forge new neural pathways.

Eat well: Just like the rest of your body, your brain benefits from unprocessed and nutrient-rich foods in your diet. To keep your brain healthy and improve recovery after an injury, eat well and avoid excessive amounts of alcohol and caffeine.

Learn new things: Learning a new language, an instrument, or another hobby promotes building new neural pathways in your brain. The more frequently you attempt to learn something new (even if you can't perform it well), the stronger and more agile your brain becomes. For brain health, it's not the skill level that counts, but your consistent effort.

Sleep: When you sleep, your brain is able to recover and recharge. Although you are not conscious at the time, your brain is doing important work to remove toxins and heal, which is why you should aim for at least seven hours of sleep each night. That way you give your brain the time it needs to function well.

Reduce stress: Stress inhibits neuroplasticity. By reducing stress, you increase the ability for your brain to learn new things, recover, and strengthen neural pathways.

What we know about neuroplasticity offers so much hope for all people, but especially those living with a brain injury. While the road to recovery might not always be smooth, the great capacity for your brain to change shows there's hope for continued improvement after an injury.

To learn more about neuroplasticity:
[National Library of Medicine](#)
[Brain Research Bulletin](#)
[Frontiers in Human Neuroscience](#)

Unique Characteristics of Assault-Related Concussions

By Margaret Means, MD

Reprinted with Permission from Research In Action, the Center for Injury Research and Prevention, Children's Hospital of Philadelphia



Margaret Means, MD

During my years of general pediatrics residency training, I became acutely aware of the epidemic of violence impacting American children. After connecting with

the Center for Injury Research and Prevention (CIRP), Center for Violence Prevention (CVP), and Minds Matter Concussion Program at CHOP, it became evident that one way I could help the community as a Child Neurology trainee was to investigate concussions in children who were victims of violence. Even though nearly 30% of pediatric concussion occurs from mechanisms other than sports, most pediatric concussion research focuses on sports and recreation-related concussion with less attention given to other mechanisms of injury. With this research gap in mind, I joined my clinical and research colleagues from CVP and the Minds Matter program to investigate concussion from assault in a recently published study in the journal *Pediatric Emergency Care*.

How Assault-Related Concussions Differ From Sports-Related Concussions

We hypothesized that children with assault-related concussions may be unique based on the factors that bring them to care, the setting of clinical care, and associated emotional and psychological factors that may influence physical recovery. In our study, we performed a retrospective cohort study of 62 children with sports-and-recreation-

related concussion (SRC) and 62 children with assault-related concussion (ARC) who presented for care within the CHOP Care Network. We assessed and compared demographic variables, medical care received, and health outcomes of these two groups and found important differences between them:

Children with ARC were more likely to be black, publicly insured, and present to the emergency department (ED) compared to children with SRC. These results are consistent with a previous study which found that underrepresented minorities were less likely to receive a concussion diagnosis when presenting to the ED with head trauma and more likely to sustain concussion from non-sports related mechanisms.

Children with ARC were 2.8 times less likely to receive concussion-specific diagnostic testing in the form of visio-vestibular testing during their initial evaluation.

More than twice as many children with ARC reported a decline in grades compared to children with SRC.

Children with ARC had a more extended recovery trajectory than their peers who sustained sports-related injuries.

The results of our study, the first to explore differences between children with SRC and ARC, suggest that children with ARC are a unique population. A greater proportion of children with ARC were from underrepresented minority groups and were publicly insured. Moreover, they were less likely to receive visio-vestibular testing at the time of diagnosis, a key tool

that predicts prognosis and treatment by identifying balance, vestibular, and oculomotor deficits associated with morbidity and longer recovery times. Finally, children with ARC reported a significant impact on school performance, which is likely multifactorial and warrants further investigation into contributing factors and possible interventions.

What Providers Can Do Now

While more research into the factors contributing to the differences in children with ARC is needed, providers can take some initial steps:

During an initial assessment, consider using standardized measures of concussion (such as visio-vestibular testing) in any child with head trauma, regardless of injury mechanism.

Consider early referral to concussion specialists in children with ARC due to their higher risk for a prolonged recovery.

Children with concussion from assault may struggle more in school, so providers should specifically inquire about school performance and partner with parents to increase school-based academic supports.

For more information, visit CHOP's Minds Matter Concussion Program [website](#) and Research In Action Blog [link](#).

Ambiguous Grief After Brain Injury

David A. Grant, TBI Survivor

Reprinted from Brainline

To be human is to grieve. As members of the human family, we all experience great joy but also grief.

My first real experience with grief came after the sudden loss of my sister-in-law. She was murdered. I was only 28 at the time and had never even heard of the five stages of grief. The only thing I knew was that I felt an inner pain I didn't understand and could not have prepared for. It took me many months to get my emotional feet under me, only to lose that footing again and again. More than 30 years later, if my mind bends back to that October 1990 day, my eyes still fill with tears. Today I know that grief never ends, it just changes form.

If there is any such thing as traditional grief, our family had a full-on crash course in 2019. It was in 2019 that both my mother and my wife Sarah's mother passed away. My mom suffered a stroke the year prior and spent her last year in a rehab. My mother-in-law passed away completely unexpectedly in her sleep. One death we knew was coming, the other blindsided us. Both were intensely painful. 2019 is not a year I will remember with much fondness.

Like it or not, the losses of our beloved mothers are part of the natural path that most of us follow. Parents age, they die, and we grieve.

But there is a type of grief that many people experience that is less common, less talked about, but none the less real and painful. It's called ambiguous grief or ambiguous loss.

Ambiguous loss, by definition, is "a loss that occurs without a significant likelihood of reaching emotional closure or a clear understanding. This kind of loss leaves a person searching for answers, and thus complicates and delays the process of grieving, and often results in unresolved grief."

In 2010, I was about to get a front row seat to living with ambiguous grief and loss.

On a sunny November day, I went out for my daily bike ride. My life changed completely when I was t-boned by a newly licensed 16-year-old driver. Local authorities estimated his speed at more than 30 MPH; apparently, he never even hit his brakes. I went through his windshield and was catapulted into a strange new existence. In addition to broken bones, bruises, and lacerations, I



had an invisible injury. Though I was wearing a helmet, I sustained a traumatic brain injury. Nothing would ever be the same.

Trying to describe to the uninjured what life is like after a brain injury is exceptionally difficult, but I'll do my best.

Just imagine if the person you know as yourself one day completely disappears, gone ... dead without being dead. My whole personality changed. I acted differently, I thought differently, I spoke differently. In an instant, literally, I was a completely different person.

One of the biggest challenges was still remembering the person I was before my injury. I saw his face every day in the mirror. His voice sounded just like mine. We wore the same clothes and had the same address. I vehemently missed that person with every fiber of my being. As it turns out, I was grieving the loss of who I used to be, although it would take me many years to be able to both understand and articulate this.

My grief was as real as any grief I had ever experienced. I went through denial and anger. The bargaining was tough. What I wouldn't give to have a do-over on that fated day. What if I'd opted

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to take a right turn that day instead of a left? With a personality change, I was a stranger to people who knew me. The loss of personal relationships was staggering — including the loss of most of my children. They no longer knew who I was.

Depression was unrelenting. I contemplated suicide for close to a year, firmly convinced that the world would be better off without me. The very act of existing was painful. I sought professional help through a grief counselor. Over the years since, I have told her fondly, many times, that she saved my life, truly.

For a long time, I underestimated my own personal tenacity, and the power of healing that comes with using one's life experiences to serve a greater good.

During my first year — when loss and sadness defined the very fabric of my being — I attended a support group for brain injury survivors. For the first time, I was in the company of others who understood the sadness and the grief that comes with the loss of self after brain injury. I had found a home, and with that a new footing in what I expected to be a small online community.

That was nine years ago. Today that same community, the Brain Injury Hope Network, serves more than 35,000 members from 60-plus countries. It is one of the world's largest groups of its kind and exemplifies the power of — and need for — connection.

In the years since my injury, I have, at least in part, become a writer, realizing a lifelong goal. My work, as published in a number of Chicken Soup for the Soul books, has been read by millions. I served as the keynote speaker at a brain injury conference ... then another and another. I am proud that my voice has helped others chart their own paths to a new normal.

As the years passed, I changed. No longer do I look at my 2010 accident as the most terrible day of my life. Yes, it will always be the day marking the biggest changes in my life, but so much good has come from it. I have a sense of purpose that I never had before my injury.

So, what about the ambiguous grief/loss that paralyzed me for many years? Today, I find myself not looking back like I did in those early years; instead, I choose to focus on who I am — and who I continue to become. And it is in that very shift of focus that I have found acceptance and a measure of peace ... both of which I wish for you today.

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Each brain injury story is unique. But there are commonalities that bind people together and make brain injury a community and not just people going about their separate journeys. USBIA recognizes Brain Injury Awareness in March of each year. Brain Injury Awareness Month's ABC's of Brain Injury is about acknowledging those similarities while also acknowledging that we experience each similarity in a unique and personal way.

Not everyone encounters each letter in their journey, of course, but the things they represent pop up often enough to paint a fairly general picture of the common experiences of the brain injury community.



A is for Acquired Brain Injury

Any brain injury you're not born with is an Acquired Brain Injury. Whether it's from a fall, an assault, a lack of oxygen or an aneurysm, if it was acquired, it's an Acquired Brain Injury.

Henry acquired his brain injury in Colorado. It was caused by an accident and his brain was damaged in several places.

E is for Emotions

People who have experienced a brain injury often have trouble regulating their emotions. However, people who are caregivers and partners find their emotions pulled in every direction as well. No matter what their cause, emotions are real and valid.

Several times in the interview Henry began to cry. He said that he cries very easily now. As Carla pointed out, grief and brain injury can go hand-in-hand.

G is for Getting Help

Having a support system in place for when you're released from the hospital is vital to establishing and maintaining a realistic recovery timeline. That is where family, community, and the Minnesota Brain Injury Alliance step in.

Jeff and Henry were fortunate to have a community waiting to step in and help Henry when he got home. Jeff also connected with Carla for support. Asking for help can be hard, but remember that people actually love to be asked and accepting offers of help can help everyone.

J is for Journey

The journey is everything that follows a brain injury. A journey can lead in unexpected directions and be shaped by the people who join you on the road.

Henry and Jeff have their own personal journeys and a shared journey. What makes their journeys a little easier is that they help to lighten each other's load and have learned to pace themselves.

M is for Memory

Memory can be affected by damage to the brain but also by emotional trauma, medication or depression. Long term, short term and prospective memory (remembering to plan) can be affected for weeks, months or years. Memory clinics and specialists exist to help learn compensatory strategies to compensate for and improve memory.

Henry lost two years of his memories from the medications he was on. This has shaped the way he looks at his life. Fortunately, he and Jeff will continue creating new memories together.

R is for Resource Facilitation

Resource Facilitation is a free, two-year telephone support program that provides education and connection to supports and services to assist people throughout Minnesota in navigating life after brain injury. Participants receive scheduled calls over a two-year period to help problem-solve issues and identify resources to help them transition back to family life, work, school, and the community while achieving the greatest level of independence as possible.