

Mental health disorders
Recovery is possible

Alzheimer's disease
Innovations in treatment

Conquer concussions
Identify the signs and symptoms

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MEDIA PLANET

December 2012

BRAIN HEALTH

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FACTS YOU DIDN'T KNOW ABOUT THE BRAIN

MY JOURNEY OUT OF THE WHEELCHAIR

Find out how neurotechnology helped Paralympics athlete Jennifer French get **back on her feet again.**

PHOTO: THE INTERNATIONAL FEDERATION OF DISABLED SAILING

PAGE 4: Traumatic Brain Injuries (TBIs) can occur on the battlefield, on the football field, on the playground, in a car accident, and even at home. **Find out what the U.S. Army is doing to raise awareness and advance research** on the long-term effects of TBIs.



Wexner Medical Center

CHALLENGES

If you are reading this publication you're currently using a variety of your brain's functions. You may also be one of the 26 percent of Americans over 18 who will suffer from diagnosable mental illness, or one of the 50 million Americans living with brain disease. While the brain plays an enormous role in our overall quality of life, it is often extremely misunderstood.

The power of the brain

You have a one in six chance of being affected by a neurologic disease. It's true. There are some 50 million Americans living with brain diseases. From soldiers returning from war with traumatic brain injury to women who live with epilepsy and wonder if they can get pregnant safely. From children who struggle with autism to grandparents beset with Alzheimer's and dementia. Brain disease takes a



Bruce Sigsbee, MD, FAAN, President, American Academy of Neurology

race, and age and cost our society \$400 billion in annual medical and related expenses. These include life-threatening disorders such as stroke, Alzheimer's, brain tumors, and amyotrophic lateral sclerosis (ALS, or Lou Gehrig's disease). There are chronic diseases that create daily challenges, such as epilepsy, migraines, and sleep disorders. Research is providing new treatments and a better understanding of the brain that will yield future breakthroughs.

Time is brain

New medicines bring relief to migraine sufferers and people with epilepsy. We now know "time is brain" when treating stroke symptoms. We are closer to more effective ways to address Alzheimer's and Parkinson's. But these are only treatments. We desperately need cures, as our population ages and become's more susceptible to these devastating diseases. Learn more at www.CureBrain-Disease.org.

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According to the Centers for Disease Control, in any given year, 26 percent of Americans over age 18 will suffer from a diagnosable mental illness—including depression, anxiety, bipolar disorder, substance use disorder, schizophrenia, PTSD, and others. And these diseases are among the leading causes of disability in the US. Yet nearly two-thirds of those affected are



Dilip V. Jeste, M.D., President, American Psychiatric Association; Distinguished Professor, Psychiatry & Neurosciences, U.C., San Diego

reluctant to seek treatment, even when effective treatments are available to them. Pervasive social stigma causes millions to suffer unnecessarily in silence, and the common but irrational fear of people with mental disorders leads to discrimination in employment and housing and even rejection by friends and family.

Seeking treatment

For many, these illnesses are treatable and a great deal of suffering could be preventable. The vast majority of people with mental illnesses can live healthier,

more productive, and more fulfilling lives. As you will learn in this supplement, mental illnesses can usually be effectively treated through talk therapies (such as cognitive behavioral therapy), medications, or a combination of the two.

Making strides

The mental health field is also making important strides in identifying the critical factors for preventing mental illnesses and promoting health and well-being. A growing body of research suggests that positive traits such as resilience, optimism, social engagement, self-efficacy, and wisdom are associated with reduced risk of both physical and mental illnesses and even increased longevity.

A "beautiful mind" is a terrible thing to waste. Eliminating social stigma and investing in better care for people with mental illnesses in the U.S. would serve as a role model for the rest of the world. Learn more at www.apa.org.

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WE RECOMMEND



Personalized Mental Health Care

Jay Lombard, DO, Chief Scientific Officer, Genomind

PAGE 9

"Understanding a particular patient's genetic information can help practitioners determine which treatments are best suited to, for example, someone diagnosed with post traumatic stress disorder (PTSD)."

MEDIA PLANET

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INSPIRATION

Standing tall

Question: Did Jennifer French accept the diagnosis she'd never get out of a wheelchair after a snowboarding accident left her a quadriplegic?

Answer: She not only "rejoined the upright world," but also delivered a Silver Medal for Team USA in sailing at the 2012 Paralympics Games and founded a resource for others with neurological or psychiatric disabilities to learn about options.

Jennifer French remembers the full moon on Friday the 13th in 1998 and her late-night snowboard run at a New England ski mountain when she hit an icy patch sending her down a 40-foot embankment.

The rest is a blur as she was rushed to a hospital by her then boyfriend now husband, Tim. The

diagnosis: an incomplete spinal cord injury at the base of her neck leaving the active 26-year-old paralyzed.

"I went through this denial stage, where I thought there's got to be a cure out there somewhere," recalls French. "I had waves of emotions, but you can decide to move quickly or get stuck in the emotional phase."

Determination

French uncovered experimental technologies for those with spinal cord injuries and became a self-described lab rat at the Cleveland FES (Functional Electrical Stimulation) Center. She became the first woman implanted with a neuroprosthetic system with electrodes in her body stimulating muscles designed to restore limited muscular functions to her lower region. Today she wears a



EYE ON THE PRIZE: Jennifer is an eight-time winner of the Milan-Gruson Award for top disabled female skippers, and most recently represented Team USA at the 2012 Paralympics in the sport of sailing – bringing home the silver. PHOTOS: THE INTERNATIONAL FEDERATION OF DISABLED SAILING

control instrument that eventually can be implanted surgically in patients, according to P. Hunter Peckham, Ph.D and professor of Case Western Reserve University who compares the system in broad terms to a Cochlear Implant.

Through hard work, determination and the system, she was able to stand for her entire wed-

ding ceremony in 2001. "The technology gave me something I would not have been able to do otherwise — walk down the aisle with my dad next to me," she says. "It was emotional."

Moving forward

She also harnessed the implanted neuroprostheses to prepare for her role in winning a silver medal

"The technology gave me something I would not have been able to do otherwise — walk down the aisle with my dad next to me."



**INNOVATIONS
IN NEURO-
TECHNOLOGY
ARE HELPING
PATIENTS OVER-
COME SPINAL
CORD INJURIES**

for Team USA in sailing at the 2012 Paralympic Games in London.

French, now 41, chronicled her experience in a book called *On My Feet Again* and co-founded the Neurotech Network of The Society to Increase Mobility. The non-profit organization focuses on educating and exposing therapies and treatments to those afflicted. "We never know when we could go through a catastrophe. You need to understand there are resources and options."

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INSIGHT

Q & A

Dr. Stephanie N. Maxfield Panker, TBI, Program Manager, U.S. Army

Question: What should the public know about invisible wounds like Traumatic Brain Injury and PTSD?

Answer: Traumatic Brain Injury (TBI) is recognized as a significant health issue affecting our service members. In terms of severity, the overwhelming majority of soldiers (75.2 percent since 2000) with TBI have sustained a concussion/mild TBI (mTBI). It is important to note that in addition to blast and combat-related incidents, TBI can be caused by non-deployment related events, such as motor vehicle accidents, military training exercises, recreational sports, falls, and other blows to the head.

Q: What are some of the

long term risks associated with repeated concussions?

A: Research is still being done to determine the long-term effects of repeated concussions. The Defense and Veterans Brain Injury Center (DVBIC) is currently conducting a 15 year longitudinal study to examine the potential long-term risks of multiple concussions.

Q: What can leaders and peers do to help reduce the stigma associated with an injured teammate sitting out a mission or a game due to a concussion?

A: Concussion/mTBI effects both the individual and the unit: prompt identification and treatment is the key to recovery in order to mitigate the physical, emotional, and cognitive effects.

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Understand traumatic brain injury and protect yourself



Thomas R. Frieden, MD, MPH, Director, Centers for Disease Control and Prevention; Administrator, Agency for Toxic Substances and Disease Registry

The neurologist Oliver Sacks once described the brain as a vast, complex orchestra "that conducts itself, with an ever-changing score and repertoire." A traumatic brain injury (TBI), whether caused by a fall in the bathroom, a car crash, or a jarring hit in a sports game, can disrupt and even silence this orchestra. We know these injuries do not need to occur as often as they do. TBIs—ranging from mild concussions to severe, life-threatening injuries—can be prevented.

Defining TBIs

In 2009 at least 3.5 million people

in the U.S. sustained a TBI either as an isolated injury or along with other injuries. TBIs happen when something hits or penetrates the head or when the head moves violently. For example, the sudden jarring movement of shaking a baby, or the rapid forward and backward movement of the head due to whiplash can cause the brain to forcefully hit the inside of the skull, injuring the brain. Falls and car crashes cause most TBIs. Sports injuries and recreational injuries account for nearly one in ten TBIs.

Most TBIs are diagnosed as mild—and are commonly called concussions—but that does not mean that they are not serious. A person who sustains a concussion can experience long-term effects and may be at higher risk for another TBI. It is important that everyone, especially

health care providers, parents and coaches, know the signs and symptoms of TBI and seek medical attention for the injured.

Advancing research

Research has shown that simple, everyday actions can safeguard us and our loved ones from TBI. Buckling up on every car trip, wearing a helmet when riding a bike or motorcycle, keeping athletes out of a game after a concussion, or removing fall hazards from the home of an older adult and stopping — in consultation with their doctor — unnecessary medicines that increase the risk of a fall can all help prevent these potentially life-altering injuries. The brain, with all its orchestral complexity, is fragile. But we can protect it.

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IF YOU THINK SOMEONE HAS

A TRAUMATIC BRAIN INJURY

A

ASSESS the situation.

B

BE ALERT for signs & symptoms.

C

CONTACT a health care professional.

GET A
HEADS UP

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The play is called, the ball is snapped—but is your player prepared for what comes next? With more than four million kids ages 6-18 playing organized football each year, head protection should be top-of-mind.

Helmet-fitting: Protecting players from the inside out

Typically the coach and athletic staff fit players with their football helmet, but parents should also share the responsibility in each game and throughout the season to be sure that the fitting is correct and the helmet components perform their protective function. For example, if you notice the pads becoming loose or the chin strap is damaged, the football staff should be alerted immediately.

Understand the benefits

While no helmet can prevent a concussion, it is never too early or too late to understand the benefits of proper helmet-fitting.

“Football helmets are designed to provide a number of protective features,” said Thad Ide, Senior

Vice President of Research and Development at Riddell Sports. “A secure fit ensures all elements of

the helmet are positioned where the engineers intended them to be, which provides better player

protection and confidence, but also helps with improved vision, hearing and comfort.”

■ Adjust the chin strap so it's centered snugly beneath the chin.

■ Ensure that the skin of the forehead moves with the front pad when the helmet is twisted.

And as an ongoing practice, players and parents should periodically review their helmet model's fitting instructions, as well as carefully inspect the interior pads, shell and hardware for dents, cracks or other damage.

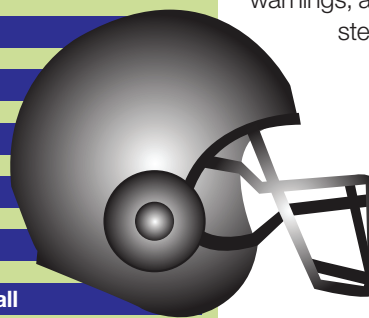
Everyone needs to be involved in player protection by supporting proper helmet-fitting—whether it's a simple scrimmage or the championship game.

Signs & Symptoms

Signs a player may have a concussion

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets plays
- Unsure of game, score or opponent
- Loses consciousness (even briefly)
- Shows behavior or personality changes
- Can't recall events prior to or after the hit or fall

SOURCE: USA Football



The proper fit

After purchasing a helmet, it's important that parents, players and coaches become familiar with the fitting guide and helmet warnings, and follow these easy steps to achieve the proper helmet fit:

■ Adjust helmet size so it's one inch above the eyebrows.

■ Inflate the crown, back and face pads so they're flush against the head.

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INNOVATE OR CHANGE THE GAME?



The concussion issue in football is not going away and we must find solutions to minimize the effect of these injuries on the athletes that choose to play.

We need solutions for athletes as young as six and for the NFL megastars. Even President Obama weighed in recently, saying: "I think that those of us who love the sport are going

to have to wrestle with the fact that it will probably change gradually to try to reduce some of the violence."

With football being America's most popular sport, we must take every measure to protect the game itself. Changing the game should be a last resort. The concussion experts are correct — the equipment cannot prevent a concussion. But can't we improve on what we're doing right now? The fact that

a helmet cannot prevent every head injury should not stop us from innovating to reduce a significant amount. The three key pieces of the concussion puzzle are: better equipment; improved management when an injury does occur; and proper treatment of the long-term effects.

To mitigate

Research proves that an athlete is more susceptible to con-

cussions if having previously suffered a concussive injury; avoiding that first injury is of paramount importance. Technique and form are key for mitigating injuries. The proper tackling techniques must be taught and many organizations are setting up speakers and clinics to make sure all coaches are instructed on drills for safe hits. In addition to technique, equipment must be improved. Many innovators are hoping to protect

players against that first head injury. One of them being POC Ventures' Guardian Cap; a soft-shell helmet cover that reduces the impact of a force to the head by as much as 33 percent. The Georgia based company sold over 8,000 units in 2012 and targets the injuries that occur in practice. Since the majority of injuries at the college levels and below happen in practice, the Guardian could be an excellent piece to the puzzle.



REDUCES 33% OF THE IMPACT TO THE HEAD

OVER 8,000 WORN IN 2012

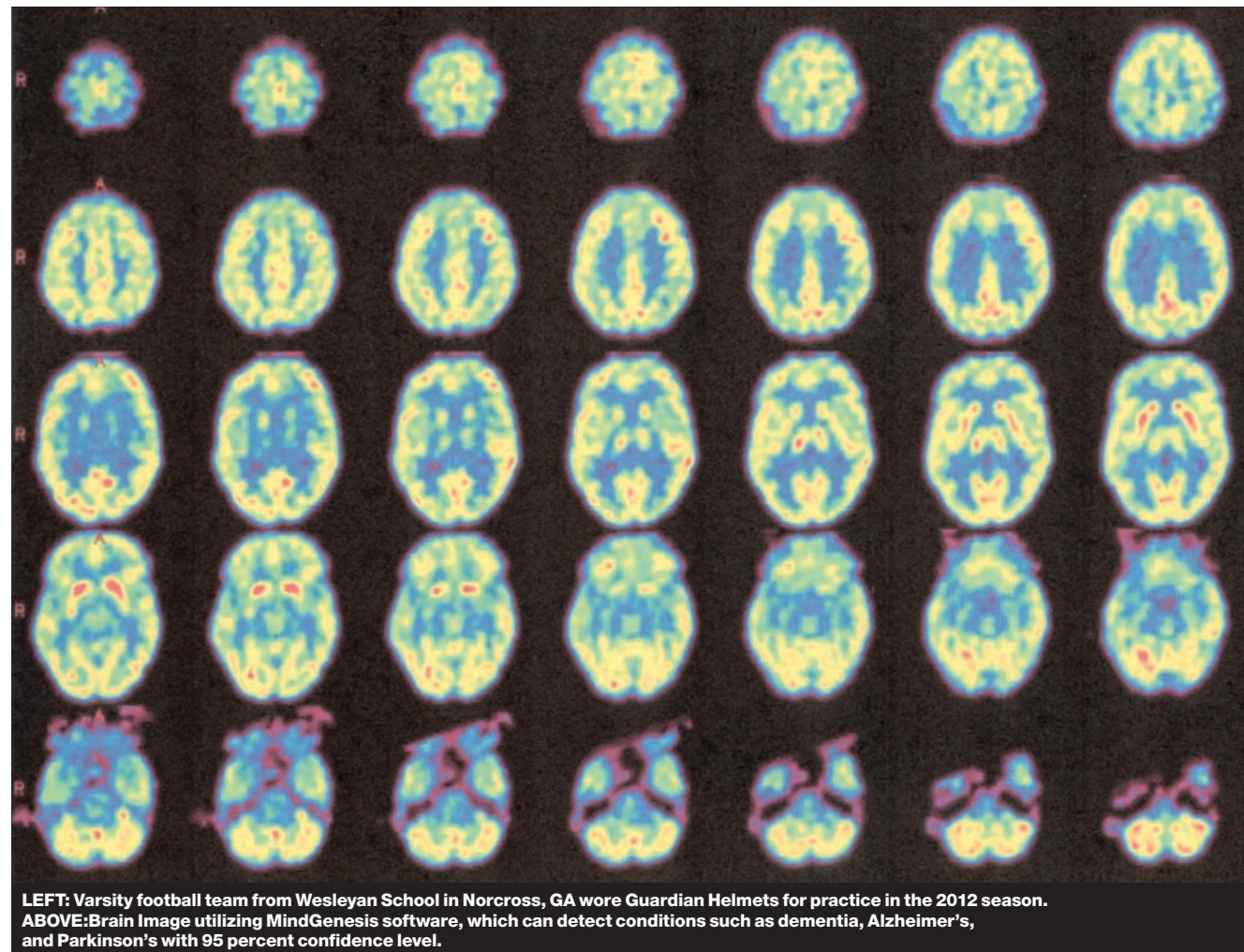
"We used the Guardian Caps for the first time this year. Our players and parents LOVE them."

- Chuck Petersen, Head Football Coach, Orange Lutheran HS

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With football being America's most popular sport, we must take every measure to protect the game itself. Changing the game should be a last resort.

LEFT: Varsity football team from Wesleyan School in Norcross, GA wore Guardian Helmets for practice in the 2012 season.
ABOVE: Brain Image utilizing MindGenesis software, which can detect conditions such as dementia, Alzheimer's, and Parkinson's with 95 percent confidence level.

To manage

America has greatly increased their knowledge and understanding about the severity of concussions over the past few years thanks to the CDC's 'Heads Up' program as well as efforts of many local and regional organizations. Rest and recovery is essential to guarding against an athlete being reinjured as well as limiting the damage caused by a concussion. Over 40 states

now have return to play laws following a diagnosed concussion. More and more athletic trainers and coaches have been focused on removing suspect players from games for proper evaluation.

To mend

Former high school, college and NFL players have had countless hits to the head in their careers. Studies are showing that the effects can be damaging and

debilitating. The ability to diagnose the long term diseases and disorders that are the result of these injuries in a living person is another key piece to the concussion puzzle. MindGenesis, a PET scanning facility in Littleton, CO can detect conditions such as dementia, Alzheimer's and Parkinson's with a 95 percent confidence level. MindGenesis utilizes its proprietary software to compare over 240 regions of the

patient's brain with over 4,000 previously scanned normal and abnormal brains to detect abnormalities. These comparisons enable a neurologist to accurately diagnose the brain, which can be a gateway for proper treatment and a delayed onset of the disease.

We must innovate

Examples such as these are steps forward and not magic solutions, but we should direct

our conversation and efforts to innovation and progress before changing the game of football and running the risk of ruining an American tradition. We live in the most technologically advanced nation in the world: it is time we apply it to the equipment, management, and treatment of the concussion issue in order to protect football.

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NEWS

* DON'T MISS

Early diagnosis

Research shows that approximately 67,000 high school football players are diagnosed with concussions annually, and at least one concussion likely occurs in almost every football game. But it's not typically one massive hit that causes injury.

Preventing dementia

When repeated concussions do occur, serious problems can arise ranging from memory loss and sleep disturbances to depression and dementia. With three or more concussions, the possibility of early-onset Alzheimer's disease is five times greater.

Early diagnosis of a concussion is critical because it provides the opportunity to consider options before those serious complications are likely to develop. "The ability to diagnose concussive damage affords the chance to have an educated discussion about risks of continued play and, inevitably, injury to the brain," says J. Adair Prall, MD, of South Denver Neurosurgery.

JILL SMITS

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Question: Why is it important to reduce head injuries in populations with special needs?

Answer: Because people with uncontrollable seizures, head banging or brain trauma are already at high risk.

Wearing helmets to reduce head injury risk

Head injuries are common among children and adults with epilepsy, as well as patients with autism who may bang their heads, those with cerebral palsy and others who have brain trauma.

Protecting the brain

Many of these patients wear protective helmets to shield the brain and the head from additional injuries.

"I have lots of patients with epilepsy who wear helmets," says Dr. Michael Kohrman, Professor of Pediatrics and Neurology at The University of Chicago Medicine Comer Children's Hospital, noting helmet use is very popular among

patients who fall to the ground during seizures.

"Most epileptics who fall don't have a warning or an aura, so it's really hard to have them sit down for a seizure," says Dr. Kohrman.

"The goal here is to create a barrier between the patient and the ground to prevent injuries."

"There's nothing wrong with risk reduction," says Dr. Schwartz. "We wear seatbelts in the car, let's wear helmets when we play."

Risk reduction

While the helmets aren't a guarantee of head protection or injury prevention, they're a good start.

"It's all about risk reduction, not elimination," says neuroscientist Dr. Steven Schwartz of the UCLA Jules Stein Eye Institute, who is also the founder for Brain First, a

non-profit that tests the safety of helmets.

Concussion prevention

Protective helmets are also encouraged for athletes to prevent concussions.

"Concussions are particularly hard to diagnose and manage," says Dr. Schwartz who explains symptoms of a concussion can include being starry eyed, nausea, vomiting and headaches.

"There's nothing wrong with risk reduction," says Dr. Schwartz. "We wear seatbelts in the car, let's wear helmets when we play."

KRISTEN CASTILLO

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PLAYERS ARE
DIAGNOSED WITH
CONCUSSIONS
ANNUALLY



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“Alzheimer’s and dementia are devastating to patients. It’s important we look at new options.”

than 100,000 patients worldwide with movement disorders such as Parkinson’s disease.

“It’s a new application of existing technology,” says Dr. Rezai.

In the study, patients with Alzheimer’s disease undergo DBS surgery with the hope of improving the frontal lobe and neural networks involved in cognition and behavior.

Deep brain stimulation

The goal of the study is “to increase activity and connectivity in the brain,” says Dr. Rezai.

The brain implant procedure, which takes five to six hours to complete, involves making a small incision in the skull to implant the pacemaker.

The deep brain stimulation implant is similar to a cardiac pacemaker device with the exception that the pacemaker wires are implanted in the brain rather than the heart.

“We think brain pacemakers are going to transform the way

we treat neurological conditions like Parkinson’s,” says Dr. Rezai. “We’re hopeful it can treat Alzheimer’s and dementias and other psychiatric and behavioral disorders such as depression and addictions.”

New options

Alzheimer’s disease is the most common form of degenerative dementia, afflicting over 5 million Americans and costing more than \$100 billion per year, ranking it the third costliest disease in terms of health care expenditures in the United States.

Alzheimer’s disease becomes progressively disabling with loss of memory, cognition, worsening behavioral function, in addition to a gradual loss of independent functioning.

“Alzheimer’s and dementia are devastating to patients,” Dr. Rezai says. “It’s important we look at new options.”

The study is scheduled to be completed in 2015.

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NEW TECHNOLOGY MAY TAKE ALZHEIMER’S TREATMENT TO A WHOLE NEW LEVEL

Question: Can a pacemaker really help to improve treatment for Alzheimer’s patients?

Answer: Researchers now say there is reason to believe so.

A new FDA-approved study at The Ohio State University (OSU) will determine if using a brain pacemaker can improve cognitive and behavioral functioning in patients with Alzheimer’s disease.

OSU’s first procedure – and

the first in the United States – happened in October.

“So far the patient is doing excellent,” says neurosurgeon Dr. Ali Rezai, Director of the Center for Neuromodulation at Ohio State University. “The patient went home within two days of surgery. Over the next six months we’ll be learning more” about how the patient is progressing with the brain pacemaker, he says.

The study, which will include 10 patients, uses deep brain stimulation (DBS), the same technology used to successfully treat more



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NEWS



NEWS IN BRIEF

What is epilepsy?

Epilepsy is a medical condition that produces seizures affecting a variety of mental and physical functions. It's also called a seizure disorder. When a person has two or more unprovoked seizures, they are considered to have epilepsy.

A seizure happens when a brief, strong surge of electrical activity affects part or all of the brain. Seizures can last from a few seconds to a few minutes. One in 10 adults will have a seizure sometime during their life.

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More people live with epilepsy than with autism, Parkinson's disease, multiple sclerosis and cerebral palsy—combined, according to a recently released report of the Institute of Medicine of the National Academies (IOM).

United for epilepsy

Someone is said to have epilepsy if they have two or more seizures of unknown cause. Over 150,000 people are diagnosed with epilepsy every year in the United States. The IOM report calls for improved education and awareness about epilepsy in our country.

A bigger voice

Two of America's strongest epilepsy organizations—the Epilepsy Foundation and the Epilepsy Therapy Project—are merging to form a new organization with unparalleled reach through a nationwide supportive care network, broad-based public awareness, education and a focus on

accelerating clinical development of innovative therapies for people with epilepsy.

"One-third of nearly three million Americans living with epilepsy have no seizure control. A staggering one in 26 Americans will develop a form of epilepsy in their lifetime, and still epilepsy remains one of the most under-supported medical conditions in the nation," said Warren Lammert, co-founder of the Epilepsy Therapy Project and the father of a child with epilepsy.

National resources

The unified organization, to be called the Epilepsy Foundation,

will include epilepsy.com – a web platform dedicated to providing information about the condition to consumers and health care professionals and 48 local Epilepsy Foundations which provide free supportive care services for individuals and families living with epilepsy. The Epilepsy Foundation of Metropolitan Washington serves the DC area.

"When your child is first diagnosed with epilepsy, the fear, isolation and questions can be paralyzing," said Philip M. Gattone, President and CEO of the Epilepsy Foundation and the father of a child with epilepsy. "By bringing together the resources of

3

OVER 150,000
PEOPLE ARE
DIAGNOSED
WITH EPILEPSY
EVERY YEAR IN
THE U.S.

the Epilepsy Foundation with the Epilepsy Therapy Project, we will be able to reach all people with epilepsy - from the newly diagnosed to soldiers returning from war - and help them understand the condition, seek out the best treatment options and educate on scientific inroads and clinical trials. No one needs to feel alone in the fight against epilepsy."

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Taking a personalized approach to mental health care

Just as in the treatment of physical health issues, there is a move in mental health care toward a more personalized approach.

First thing's first

"The first step towards a personalized model is to have people assessed and cared for by professionals in concert with family and peer supports," says Ken Duckworth, MD, Medical Director of the National Alliance on Mental Illness.

Michael Otto, PhD, psychology professor at Boston University, and co-author of *Exercise for Mood and Anxiety Disorders*, says the field as a whole is in the early stages of tailored treatment. "The form of personalized medi-

cine most available at present is simply patient preference."

But, there is hope for some exciting possibilities on the horizon.

Long-term goals

"With additional genetic information, probably the first emergence

of personalized medicine in psychiatry will be the identification of which medications would lead to greater or lesser levels of side effects for a given individual," says Otto. "From this modest beginning, there is hope that brain imaging studies may better guide

selection of cognitive-behavior therapy versus medication for depression or anxiety disorders."

The role of genetics

Jay Lombard, DO, Chief Scientific Officer at genetic test developer Genomind, says understanding a particular patient's genetic information can help practitioners determine which treatments are best suited to, for example, someone diagnosed with post traumatic stress disorder (PTSD).

"We know there is a heightened vulnerability to PTSD based on certain genes. If we treat patients based on their specific wiring, interventions will be better and more effective."

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* DID YOU KNOW?

■ A mental illness is a medical condition that disrupts a person's thinking, feeling, mood, ability to relate to others and daily functioning.

One in four adults—approximately 57.7 million Americans—experience a mental health disorder in a given year. One in 17 lives with a serious mental illness such as schizophrenia, major depression or bipolar disorder and about one in 10 children live with a serious mental or emotional disorder.

Mental illnesses can affect persons of any age, race, religion or income. Mental illnesses are not the result of personal weakness, lack of character or poor upbringing.

The good news about mental illness is that recovery is possible.

SOURCE: NATIONAL ALLIANCE ON MENTAL ILLNESS (NAMI)

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* WHAT IS PERSONALIZED MEDICINE?

■ Scientists have discovered specific genetic variations that modify the body's response to certain drugs and therapies. By identifying these variations, clinicians can design a treatment plan optimized for an individual patient. This new development is known as "personalized medicine."

■ Personalized medicine has the potential to both increase treatment effectiveness and lower costs across a wide range of medical specialties. Applying this technology to mental health provides a more rational and personalized approach to treatment.

GENOMIND Brain Science to Better Lives

From treating the illness... to treating the individual

Clinicians use observations, interviews, and monitoring to understand patients struggling with mental health conditions. Now, however, innovative gene-based tools are helping them discover what lies beneath difficult to treat patients. At Genomind, we are working with the nation's mental health leaders, and we are committed to bringing these scientific advancements to the clinic in order to improve patients' lives.

Our Genecept™ Assay, a simple to use saliva-based test, provides a patient's genetic profile and biomarkers to aid clinicians in making informed treatment decisions. The Genecept Assay has already made an impression in the mental health community and has impacted the treatment of patients nationwide. Join us on our journey to positively influence patient outcomes. Order a test today at www.genomind.com



“Psychiatrists and mental health professionals have long practiced personalized medicine, individualizing complex combinations of treatments for their patients. We are now on the brink of a new era where genomics can be added to the tools they use to select treatment options with the best chances of tolerability and efficacy.”

Stephen M. Stahl, MD, PhD
Professor of Psychiatry University of California, San Diego (UCSD)
Genomind Scientific Advisory Board Member

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NEWS



ASK THE EXPERT



Jay Lombard,
DO, Chief Scientific
Officer, Genomind

will be the most important advancement; the key is diagnostics. Our ability to detect conditions, such as Alzheimer's, in their pre-clinical stages affords us the opportunity to either forestall or prevent them.

“The first misconception is that neuropsychiatric disorders are not as biologically driven as diabetes or cancer.”

■ Question: What is the most common misconception or misunderstanding about your field?

■ Answer: The first misconception is that neuropsychiatric disorders are not as biologically driven as diabetes or cancer. The second misconception is that genetics are deterministic. Genes inform us about the biological underpinnings of diseases in the brain.

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■ Question: What is the most innovative advancement that has been made in your field of brain health in the last decade and what does it mean for patients?

■ Answer: We now have evidence that even serious brain disorders are potentially not irreversible. Advancements in our understanding of the biological mechanisms in neuropsychiatric disorders will greatly enhance our ability to treat these conditions more effectively.

■ Question: What advancements do you foresee your field contributing to brain health, injury, and disease in the next decade?

■ Answer: Preventive approaches to neuropsychiatric disorders

Using non-drug therapy to short-circuit seizures

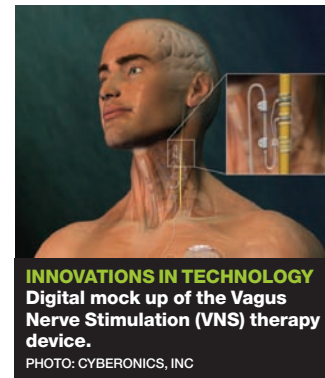
Vagus Nerve Stimulation therapy is being used for treating epilepsy and depression.

For many of the three million Americans with epilepsy, the illness is frustratingly resistant to standard therapies. Effective epilepsy management is often a matter of finding the right combination of therapies, aiming for the best seizure control with the fewest side-effects, explains Sandra Helmers, MD, MPH, Associate Professor of Neurology and Pediatrics at Emory University School of Medicine.

One of the most useful tools in this arsenal of treatments is not

in fact a drug. With Vagus Nerve Stimulation (VNS) therapy, a device about the size of a stopwatch is implanted in the patient's chest. A wire is guided up the neck and attached to the

left-side vagus nerve, one of a pair of nerves that run from the brainstem down each side of the torso. The device is programmed to emit regular electrical pulses that “short-circuit the electrical storm causing the seizures,” explains



INNOVATIONS IN TECHNOLOGY
Digital mock up of the Vagus Nerve Stimulation (VNS) therapy device.

PHOTO: CYBERONICS, INC

James Wheless, MD, Professor and Chief of Pediatric Neurology, Le Bonheur Children's Hospital, and one of the pioneers of this VNS therapy.

Effective in children as well as adults, VNS has been used to treat epilepsy

for 15 years with few serious side-effects. More recently it has been approved for use in patients with severe treatment-resistant depression.

AVERY HURT

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NEWS IN BRIEF



James Cavuoto
Editor, Neurotech
Business Report

Neurotechnology's team effort

Neurotechnology—the intersection of electronics and the nervous system—is one of the most

promising and fastest growing fields in health care today. One of the reasons for its rapid growth is that it represents the best efforts of brain researchers, who were trained in basic neuroscience, and neural engineers, who applied concepts learned in engineering, electronics, and physics.

Working together, these disparate disciplines have developed new devices for treating a host of neurological diseases and

disorders. In leapfrog fashion, advances in our understanding of the brain have led directly to improvements in neurotech tools such as deep brain stimulation or brainwave sensing. Conversely, each new generation of neurotech device has given brain researchers a deeper understanding of how the brain works.

JAMES CAVUOTO

editorial@mediaplanet.com



Partnering for life



Cyberonics strives to advance patient care through insightful application of innovative technologies. Our vagus nerve stimulation system is the only FDA-approved device for refractory epilepsy and treatment-resistant depression. As pioneers of VNS Therapy®, Cyberonics continues to advance innovation in neuromodulation. We collaborate with top researchers, partners, and experienced clinicians to enhance solutions, improve patient outcomes, and achieve physician satisfaction.

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We still don't fully understand what causes Alzheimer's disease, but scientists are zeroing in on the answers.

This is one of the most exciting — and most important — areas of research, because understanding the causes should lead to more targeted treatments and ways to prevent the disease.

Risk factors

Scientists generally agree that there is unlikely to be a single clear “cause” of Alzheimer's. It is more likely the result of a combination of inter-related factors, including genetic factors, which are passed along family lines of inheritance, and environmental influences, which range from previous head trauma to educational level to one's experiences early in life. Each of these “risk factors” is currently the subject of a great deal of research. A growing body of research is also helping to

Scientists now have a much clearer picture of what happens to the brain when Alzheimer's strikes.

identify various “lifestyle factors,” such as dietary habits, high blood pressure and high cholesterol, which may influence one's risk of

Alzheimer's disease.

What is clear is that Alzheimer's develops as a result of a complex cascade of biological processes that take place over many years inside the brain.

Stunning progress has been made recently in unraveling this cascade, and scientists now have a much clearer picture of what happens to the brain when Alzheimer's strikes.

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Q & A

The “TRAP” method: How a new procedure is shaping up to be a breakthrough in Alzheimer's research

Question: How will this new technology impact the study of Alzheimer's?

Answer: The TRAP method can help researchers determine the molecular cause of the disease.

According to the Alzheimer's Association, over five million Americans have the disease, which destroys brain cells and is the most common form of dementia.

A new procedure, called “Translating Ribosome Affinity Purification” (TRAP) may help researchers determine brain cell profiles and learn how neurological diseases like Alzheimer's attack the brain.

“The TRAP procedure enables us to identify all proteins that

are being made in any given cell type,” explains Nobel Laureate Dr. Paul Greengard, the Director of the Fisher Center for Alzheimer's Disease Research at The Rockefeller University.

“In the case of Alzheimer's research, we can use this methodology to identify those proteins that are made in brain cells that are vulnerable to cell death in Alzheimer's disease, and in those brain cells that are resistant to cell death in Alzheimer's disease,” he continues. “By comparing the results obtained in the two types of cells, it should be possible to determine the molecular cause of the disease.”

KRISTEN CASTILLO

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BrainHQ Effective at Improving Brain Function for a Wide Range of People

BrainHQ, the next-generation brain training system from industry leader Posit Science, has now been shown to improve brain performance in more than 60 studies published in scientific and medical journals. These studies have examined people with diverse needs and experiences, including aging adults, cancer survivors suffering from “chemobrain,” and more. Additional studies are underway, including a large-scale study funded by the Department of Defense with veterans who have experienced a traumatic brain injury.

To some, it seems odd that online exercises can do so much to improve cognitive performance. But as Dr. Michael Merzenich—Posit Science co-founder and professor

emeritus at the University of California—points out, computers are able to deliver the stimuli the brain needs to speed up, sharpen, and strengthen its neural communication. “Our exercises have been built with the input of dozens of top brain specialists from around the world,” he says. “They have been specifically designed to engage sets of neurons that slow down and get less coordinated as we age, and when we experience a brain trauma or other cognitive loss.”

BrainHQ currently includes exercises in memory, attention, brain speed, intelligence, and people skills. A sixth area, navigation, is still to be developed.

For more information or to try BrainHQ, visit www.brainhq.com/post.



Brain injury survivor Randy Profeta credits Posit Science brain training with helping him recover his cognitive health and get back to competitive cycling

www.BrainHQ.com/post

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Proven in labs and in lives

- 60+ studies published in the Journal of the American Medical Association and other top publications.
- Large-scale study funded by the Department of Defense on veterans with brain injuries underway

“It's like I've walked out of a fog. Anybody who's known me over the past several years will have seen a real turnaround since Posit Science.” – Ed Steenerson



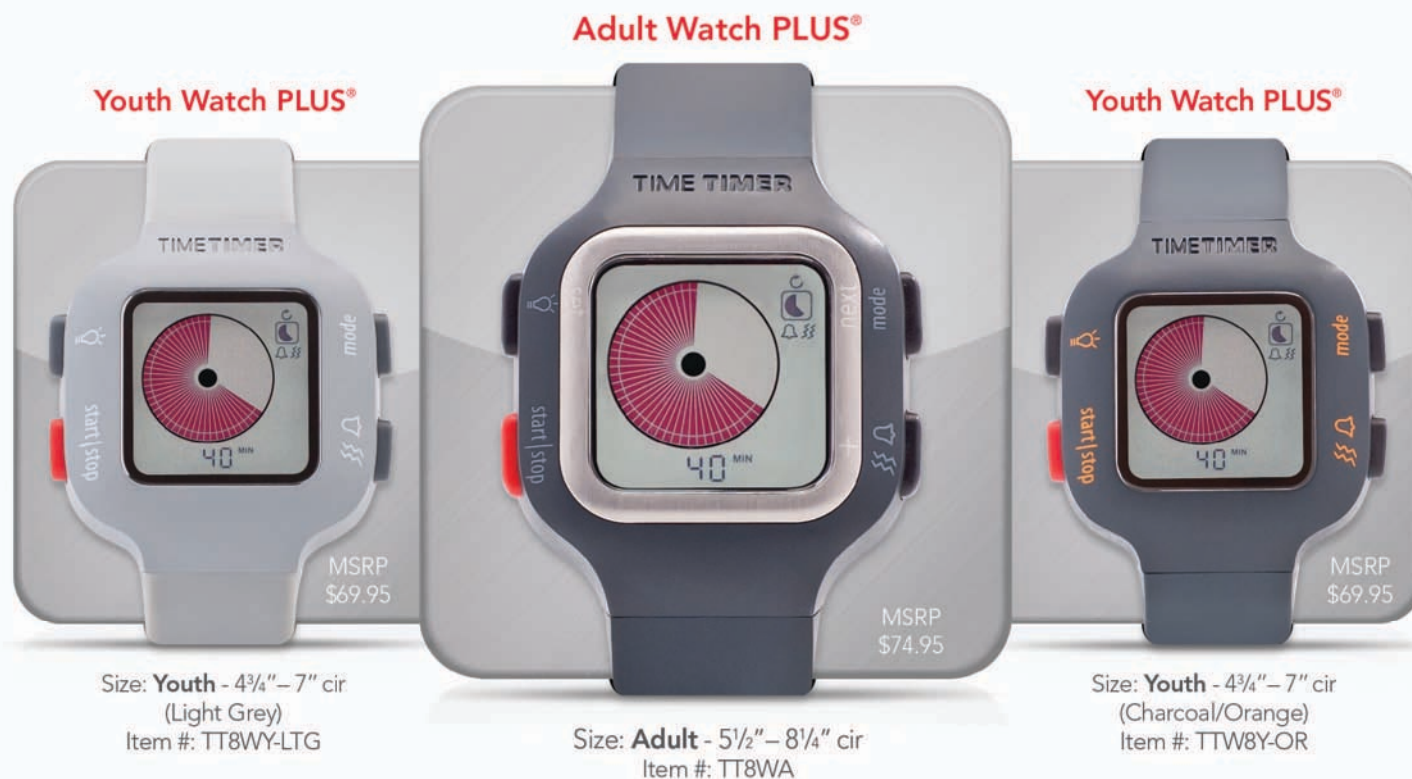
Just as you can exercise your body, you can also exercise your brain — including your memory, attention, and focus. BrainHQ has been clinically proven to improve cognitive performance so you can be your best.

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