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Elizabeth Jackson

1132476

ME002

**Executive Office of The President  
Barcode Scanning Sheet**



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Collection Code: **CTrack**

Staff Name:

Document Date: **February 26, 2014**

Correspondent:

Subject/Description: **I SEND GREETINGS TO ALL THOSE PARTICIPATING IN  
THE CONGRESSIONAL BRAIN INJURY TASK FORCE'S  
BRAIN INJURY AWARENESS DAY ON CAPITOL HILL.**

Scanned by  
ORM



February 26, 2014

I send greetings to all those participating in the Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill.

Each year, more than 1 million traumatic brain injuries (TBIs) occur in the United States. With effects ranging from mild to severe, TBI can affect thinking, sensation, language, or emotions for brief or extended periods of time. By raising awareness and advancing research for TBI, we can help prevent new incidents from taking place and support those living with its effects. And we can improve care for our Nation's service members and veterans, who too often experience TBI.

Caused by sudden trauma that damages the brain, TBI is an important public health problem that touches people of all ages. TBI is preventable in many cases, and we can all take steps to reduce our chances of sustaining a brain injury—from wearing a helmet during sporting activities to ensuring living spaces are safe for children and seniors. More work remains to unlock the mysteries of the brain, and if we continue to harness our ingenuity to remain at the forefront of medical innovation, we can imagine a future where we can reverse the effects of TBI.

I join in standing with all those affected by TBI, including our wounded warriors who have given of themselves to defend us all. On Brain Injury Awareness Day, let us recommit to building a healthier tomorrow for every American.

**POTUS AP**

**BO / FR / GM / AW / SS / jb**

**Message - Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill**

**BARACK OBAMA (A)**

ok to AP  
-fi

**RETURN TO POTUS**

**FEB 26 2014**

**CORRESPONDENCE**



February 26, 2014

Ms. Alyssa Penna  
Washington, D.C.

Dear Ms. Penna:

I am pleased to enclose a Message from President Barack Obama.

Please be advised that the White House has strict guidelines governing the use of Presidential Messages. The enclosed document may only be used for the specific date and purpose for which it was provided. This letter may be read aloud and used for display at this event.

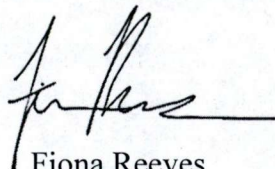
Note that the Message cannot appear in publications or forms of communication, including but not limited to, electronic, print, and/or display on a website.

Any unauthorized use or display of this Message or White House letterhead is strictly prohibited without the prior written consent of the Director of Presidential Correspondence.

Please also note the following non-comprehensive list of actions that are expressly prohibited: alteration of this Message; sale of this Message; and use of this Message for fundraising, recruiting, advertising, solicitation, promotion, or as an endorsement of any individual, entity, organization, or unit of government. These prohibitions apply in all forms of communication, including, but not limited to electronic, print, and/or display on website.

Thank you for your cooperation in adhering to these guidelines.

Sincerely,



Fiona Reeves  
Special Assistant to the President and  
Director of Presidential Correspondence

*Jillian confirming this will  
be handdelivered.*



THE WHITE HOUSE

WASHINGTON, DC 20502

**FIRST CLASS**  
**DO NOT BEND**

Ms. Alyssa Penna  
Washington, D.C.



I'm ok w/ removing the  
second "raising  
awareness."

-SS

I think the second "raising awareness"  
reinforces the first mention. However, if  
others want to remove it, feel free.

lets remove



one million  $\Rightarrow$  1 million  
Per style guide  
nice.

February 26, 2014

I send greetings to all those participating in the Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill.

Each year, more than one million traumatic brain injuries (TBIs) occur in the United States. With effects ranging from mild to severe, TBI can affect thinking, sensation, language, or emotions for brief or extended periods of time. By raising awareness and advancing research for TBI, we can help prevent new incidents from taking place and support those living with its effects. And we can improve care for our Nation's service members and veterans, who too often experience TBI.

Caused by sudden trauma that damages the brain, TBI is an important public health problem that touches people of all ages. TBI is preventable in many cases, and we can all take steps to reduce our chances of sustaining a brain injury—from wearing a helmet during sporting activities to ensuring living spaces are safe for children and seniors. More work remains to unlock the mysteries of the brain, and if we continue to harness our ingenuity to remain at the forefront of medical innovation, we can imagine a future where we can reverse TBI.

I join in standing with all those affected by TBI, including our wounded warriors who have given of themselves to defend us all. On Brain Injury Awareness Day, let us recommit to raising awareness and building a healthier tomorrow for every American.

**POTUS AP**

**BO / FR / GM / AW / SS / jb**

**Message - Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill**

I know the POTUS remarks say "reverse traumatic brain injury or PTSD for our veterans who are coming home," but it feels awkward to say "reverse TBI" and not something like "reverse the effects of TBI" in this sentence. Thoughts?

I am ok with that. -SS

I'm okay w/ making this ~~break~~ break.

Good catch/call.



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## The White House

Office of the Press Secretary

For Immediate Release

April 02, 2013

# Remarks by the President on the BRAIN Initiative and American Innovation

East Room

10:04 AM EDT

THE PRESIDENT: Thank you so much. (Applause.) Thank you, everybody. Please have a seat. Well, first of all, let me thank Dr. Collins not just for the introduction but for his incredible leadership at NIH. Those of you who know Francis also know that he's quite a gifted singer and musician. So I was asking whether he was going to be willing to sing the introduction -- (laughter) -- and he declined.

But his leadership has been extraordinary. And I'm glad I've been promoted Scientist-in-Chief. (Laughter.) Given my grades in physics, I'm not sure it's deserving. But I hold science in proper esteem, so maybe that gives me a little credit.

Today I've invited some of the smartest people in the country, some of the most imaginative and effective researchers in the country -- some very smart people to talk about the challenge that I issued in my State of the Union address: to grow our economy, to create new jobs, to reignite a rising, thriving middle class by investing in one of our core strengths, and that's American innovation.

Ideas are what power our economy. It's what sets us apart. It's what America has been all about. We have been a nation of dreamers and risk-takers; people who see what nobody else sees sooner than anybody else sees it. We do innovation better than anybody else -- and that makes our economy stronger. When we invest in the best ideas before anybody else does, our businesses and our workers can make the best products and deliver the best services before anybody else.

And because of that incredible dynamism, we don't just attract the best scientists or the best entrepreneurs -- we also continually invest in their success. We support labs and universities to help them learn and explore. And we fund grants to help them turn a dream into a reality. And we have a patent system to protect their inventions. And we offer loans to help them turn those inventions into successful businesses.

And the investments don't always pay off. But when they do, they change our lives in ways that we could never have imagined. Computer chips and GPS technology, the Internet -- all these things grew out of government investments in basic research. And sometimes, in fact, some of the best products and services spin off completely from unintended research that nobody expected to have certain applications. Businesses then used that technology to create countless new jobs.

So the founders of Google got their early support from the National Science Foundation. The Apollo project that put a man on the moon also gave us eventually CAT scans. And every dollar we spent to map the human genome has returned \$140 to our economy -- \$1 of investment, \$140 in return. Dr. Collins helped lead that genome effort, and that's why we thought it was appropriate to have him here to announce the next great American project, and that's what we're calling the BRAIN Initiative.

As humans, we can identify galaxies light years away, we can study particles smaller than an atom. But we still haven't unlocked the mystery of the three pounds of matter that sits between our ears. (Laughter.) But today, scientists possess the capability to study individual neurons and figure out the main functions of certain areas of the brain. But a human brain contains almost 100 billion neurons making trillions of connections. So Dr. Collins says it's like listening to the strings section and trying to figure out what the whole orchestra sounds like. So as a result, we're still unable to cure diseases like Alzheimer's or autism, or fully reverse the effects of a stroke. And the most powerful computer in the world isn't nearly as intuitive as the one we're born with.

So there is this enormous mystery waiting to be unlocked, and the BRAIN Initiative will change that by giving scientists the tools they need to get a dynamic picture of the brain in action and better understand how we think and how we learn and how we remember. And that knowledge could be -- will be -- transformative.

In the budget I will send to Congress next week, I will propose a significant investment by the National Institutes of Health, DARPA, and the National Science Foundation to help get this project off the ground. I'm directing my bioethics commission to make sure all of the research is being done in a responsible way. And we're also partnering with the private sector, including leading companies and foundations and research institutions, to tap the nation's brightest minds to help us reach our goal.

And of course, none of this will be easy. If it was, we would already know everything there was about how the brain works, and presumably my life would be simpler here. (Laughter.) It could explain all kinds of things that

## WATCH THE VIDEO



April 02, 2013 12:32 PM

President Obama Speaks on the BRAIN Initiative and American Innovation



## LATEST BLOG POSTS

February 26, 2014 9:25 AM EST

Transformational Changes in Schools Nationwide

February 25, 2014 6:20 PM EST

Get Your Popcorn Ready! It's the First Ever White House Film Festival  
The White House is hosting the first-ever Student Film Festival, featuring the work of more than a dozen young filmmakers who created short films celebrating the role of technology in the classroom.

February 25, 2014 5:11 PM EST

Manufacturing Innovation Institutes:  
Putting America at the Forefront of 21st Century Manufacturing  
President Obama announces two new public-private manufacturing innovation institutes -- one in Chicago and one in the Detroit area -- as well as a competition for the first of four additional manufacturing innovation institutes.

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go on in Washington. (Laughter.) We could prescribe something. (Laughter.)

So it won't be easy. But think about what we could do once we do crack this code. Imagine if no family had to feel helpless watching a loved one disappear behind the mask of Parkinson's or struggle in the grip of epilepsy. Imagine if we could reverse traumatic brain injury or PTSD for our veterans who are coming home. Imagine if someone with a prosthetic limb can now play the piano or throw a baseball as well as anybody else, because the wiring from the brain to that prosthetic is direct and triggered by what's already happening in the patient's mind. What if computers could respond to our thoughts or our language barriers could come tumbling down. Or if millions of Americans were suddenly finding new jobs in these fields -- jobs we haven't even dreamt up yet -- because we chose to invest in this project.

That's the future we're imagining. That's what we're hoping for. That's why the BRAIN Initiative is so absolutely important. And that's why it's so important that we think about basic research generally as a driver of growth and that we replace the across-the-board budget cuts that are threatening to set us back before we even get started. A few weeks ago, the directors of some of our national laboratories said that the sequester -- these arbitrary, across-the-board cuts that have gone into place -- are so severe, so poorly designed that they will hold back a generation of young scientists.

When our leading thinkers wonder if it still makes sense to encourage young people to get involved in science in the first place because they're not sure whether the research funding and the grants will be there to cultivate an entire new generation of scientists, that's something we should worry about. We can't afford to miss these opportunities while the rest of the world races ahead. We have to seize them. I don't want the next job-creating discoveries to happen in China or India or Germany. I want them to happen right here, in the United States of America.

And that's part of what this BRAIN Initiative is about. That's why we're pursuing other "grand challenges" like making solar energy as cheap as coal or making electric vehicles as affordable as the ones that run on gas. They're ambitious goals, but they're achievable. And we're encouraging companies and research universities and other organizations to get involved and help us make progress.

We have a chance to improve the lives of not just millions, but billions of people on this planet through the research that's done in this BRAIN Initiative alone. But it's going to require a serious effort, a sustained effort. And it's going to require us as a country to embody and embrace that spirit of discovery that is what made America, America.

They year before I was born, an American company came out with one of the earliest mini-computers. It was a revolutionary machine, didn't require its own air conditioning system. That was a big deal. It took only one person to operate, but each computer was eight feet tall, weighed 1,200 pounds, and cost more than \$100,000. And today, most of the people in this room, including the person whose cell phone just rang -- (laughter) -- have a far more powerful computer in their pocket. Computers have become so small, so universal, so ubiquitous, most of us can't imagine life without them -- certainly, my kids can't.

And, as a consequence, millions of Americans work in fields that didn't exist before their parents were born. Watson, the computer that won "Jeopardy," is now being used in hospitals across the country to diagnose diseases like cancer. That's how much progress has been made in my lifetime and in many of yours. That's how fast we can move when we make the investments.

But we can't predict what that next big thing will be. We don't know what life will be like 20 years from now, or 50 years, or 100 years down the road. What we do know is if we keep investing in the most prominent, promising solutions to our toughest problems, then things will get better.

I don't want our children or grandchildren to look back on this day and wish we had done more to keep America at the cutting edge. I want them to look back and be proud that we took some risks, that we seized this opportunity. That's what the American story is about. That's who we are. That's why this BRAIN Initiative is so important. And if we keep taking bold steps like the one we're talking about to learn about the brain, then I'm confident America will continue to lead the world in the next frontiers of human understanding. And all of you are going to help us get there.

So I'm very excited about this project. Francis, let's get to work. God bless you and God bless the United States of America. Thank you. (Applause.)

END  
10:16 AM EDT

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February 24, 2014

I send greetings to all those participating in the Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill.

Each year, more than one million traumatic brain injuries (TBIs) occur in the United States. With effects ranging from mild to severe, TBI can affect thinking, sensation, language, or emotions for brief or extended periods of time. By raising awareness and advancing research for TBI, we can help prevent new incidents from taking place and support those living with its effects. And we can improve care for our Nation's service members and veterans, who too often experience TBI while serving in uniform.

Caused by sudden trauma that damages the brain, TBI is an important public health problem that can impact touches people of all ages. TBI is preventable in many cases, and we all can all take steps to reduce our chances of sustaining a brain injury—from wearing a helmet during sporting activities to ensuring living spaces are safe for children and seniors. More work remains to unlock the mysteries of the brain. And if we continue to harness our ingenuity to remain at the forefront of medical innovation, we can imagine a future where we can reverse TBI.

I join in standing with all those affected by TBI, including our wounded warriors who have given of themselves to defend us all. On Brain Injury Awareness Day, let us recommit to raising awareness and building a healthier tomorrow for every American.

[POTUS AUTOPEN]

**Comment [SS1]:** The Congressional Brain Injury Task Force is holding its annual Congressional Brain Injury Awareness Day on Capitol Hill. This day brings traumatic brain injury (TBI) survivors, families, advocates, and providers together to promote awareness and research of brain injury.

We completed messages for this occasion in 2013, 2012, 2011, 2010

**Comment [SS2]:** Read aloud

**Comment [SS3]:** idea

**Comment [SS4]:** Confirmed by Jacqueline and consistent with past years.

**Comment [SS5]:** CDC:  
Every year, at least 1.7 million TBIs occur either as an isolated injury or along with other injuries.1

NIH:  
Other statistics dramatically tell the story of head injury in the United States. Each year:  
· approximately 1.4 million people experience a TBI

**Comment [SS6]:** CDC:

The severity of a TBI may range from "mild," i.e., a brief change in mental status or consciousness, to "severe," i.e., an extended period of unconsciousness or amnesia after the injury. TBI can cause a wide range of functional short- or long-term changes affecting thinking, sensation, language, or emotions.

•Thinking (i.e., memory and reasoning); ... [1]

**Comment [AW7]:** Flagged this last year as well, but we've not really gone into this kind of de... [2]

**Comment [AW8]:** TBI can affect those currently serving in uniform as well as veterans.

**Comment [SS9]:** NIH:  
What is a Traumatic Brain Injury? ... [3]

**Comment [SS10]:** CDC  
Traumatic brain injury (TBI) is a serious public health problem in the United States. Each year, trau... [4]

**Comment [SS11]:**

**Comment [SS12]:** CDC:  
There are many ways to reduce the chances of sustaining a traumatic brain injury, including... [5]

**Comment [SS13]:** These are two suggestions on the CDC page

**Comment [SS14]:** POTUS Remarks on the BRAIN initiative: ... [6]

**Comment [SS15]:** POTUS Remarks on the BRAIN initiative: ... [7]



CDC:

The severity of a TBI may range from “mild,” i.e., a brief change in mental status or consciousness, to “severe,” i.e., an extended period of unconsciousness or amnesia after the injury.

TBI can cause a wide range of functional short- or long-term changes affecting thinking, sensation, language, or emotions.

- **Thinking** (i.e., memory and reasoning);
- **Sensation** (i.e., touch, taste, and smell);
- **Language** (i.e., communication, expression, and understanding); and
- **Emotion** (i.e., depression, anxiety, personality changes, aggression, acting out, and social inappropriateness).<sup>1</sup>

Flagged this last year as well, but we’ve not really gone into this kind of detail for this particular message, but I’m fine with leaving it in, if others want to do so.

NIH:

### **What is a Traumatic Brain Injury?**

TBI, a form of acquired brain injury, occurs when a sudden trauma causes damage to the brain.

CDC:

A TBI is caused by a bump, blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. Not all blows or jolts to the head result in a TBI. The severity of a TBI may range from “mild,” i.e., a brief change in mental status or consciousness to “severe,” i.e., an extended period of unconsciousness or amnesia after the injury.

CDC

Traumatic brain injury (TBI) is a serious public health problem in the United States. Each year, traumatic brain injuries contribute to a substantial number of deaths and cases of permanent disability. Every year, at least 1.7 million TBIs occur either as an isolated injury or along with other injuries.<sup>1</sup>



NOTE: We referred to it as a "serious public health problem" in the 2012 message

Page 1: [5] Comment [SS12]

Sarah Sullivan

2/25/2014 1:17:00 PM

CDC:

There are many ways to reduce the chances of sustaining a traumatic brain injury, including:

Page 1: [6] Comment [SS14]

Sarah Sullivan

2/25/2014 1:17:00 PM

POTUS Remarks on the BRAIN initiative:

As humans, we can identify galaxies light years away, we can study particles smaller than an atom. But **we still haven't unlocked the mystery of the three pounds of matter that sits between our ears.**

**So there is this enormous mystery waiting to be unlocked,** and the BRAIN Initiative will change that by giving scientists the tools they need to get a dynamic picture of the brain in action and better understand how we think and how we learn and how we remember. And that knowledge could be -- will be -- transformative.

Page 1: [7] Comment [SS15]

Sarah Sullivan

2/25/2014 1:17:00 PM

POTUS Remarks on the BRAIN initiative:

And of course, none of this will be easy. If it was, we would already know everything there was about how the brain works, and presumably my life would be simpler here. (Laughter.) It could explain all kinds of things that go on in Washington. (Laughter.) We could prescribe something. (Laughter.)

**So it won't be easy. But think about what we could do once we do crack this code.** Imagine if no family had to feel helpless watching a loved one disappear behind the mask of Parkinson's or struggle in the grip of epilepsy. **Imagine if we could reverse traumatic brain injury or PTSD for our veterans who are coming home.** Imagine if someone with a prosthetic limb can now play the piano or throw a baseball as well as anybody else, because the wiring from the brain to that prosthetic is direct and triggered by what's already happening in the patient's mind. What if computers could respond to our thoughts or our language barriers could come tumbling down. Or if millions of Americans were suddenly finding new jobs in these fields -- jobs we haven't even dreamt up yet -- because we chose to invest in this project.

**That's the future we're imagining.**



## Burger, Jillian

---

**From:** Burger, Jillian  
**Sent:** Wednesday, February 26, 2014 4:57 PM  
**To:** Sullivan, Sarah; Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Hey Jacqueline!

Can you confirm that the message will be hand delivered?

Thanks!  
Jillian

---

**From:** Sullivan, Sarah  
**Sent:** Monday, February 24, 2014 8:23 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** Re: 2014 Capitol Hill Brain Injury Awareness Day

Great, thank you!

---

**From:** Harris, Jacqueline  
**Sent:** Monday, February 24, 2014 07:09 PM  
**To:** Sullivan, Sarah  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Correct term is: Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill

---

**From:** Harris, Jacqueline  
**Sent:** Monday, February 24, 2014 6:27 PM  
**To:** Sullivan, Sarah  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Hi Sarah,

We're checking on this and will circle back with more information.

Best,  
Jacqueline

---

**From:** Sullivan, Sarah  
**Sent:** Monday, February 24, 2014 5:50 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day



## Burger, Jillian

---

**From:** Reeves, Fiona O.  
**Sent:** Wednesday, February 26, 2014 12:32 PM  
**To:** Sullivan, Sarah  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: Message Request: 2014 Capitol Hill Brain Injury Awareness Day

This looks good and I'll take a look at the draft now.

---

**From:** Sullivan, Sarah  
**Sent:** Tuesday, February 18, 2014 6:33 PM  
**To:** Reeves, Fiona O.  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** Message Request: 2014 Capitol Hill Brain Injury Awareness Day

Fiona,

This is a request from OLA; Alejandro Perez is the Commissioned Officer. The request is for a Presidential Message to be read aloud at the 2014 Capitol Hill Brain Injury Awareness Day. This is an observance sponsored by the Congressional Brain Injury Task Force. We completed messages for this occasion in 2013, 2012, 2011, and 2010, attached. Below, Alex confirms no vet is required here as long as no other organizations are involved. In the email attached, Jacqueline confirms that she is not aware of any other associated organizations.

Our recommendation is to move forward. If you agree, we will aim to release by 2/26.

Thanks,  
Sarah

---

**From:** Platkin, Alex  
**Sent:** Thursday, February 06, 2014 4:02 PM  
**To:** Ernst, Benjamin (Associate); Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

As long as there is no organization involved, then I don't think we need to vet.

---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 4:02 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

+ Vetting

---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 3:58 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** FW: 2014 Capitol Hill Brain Injury Awareness Day



Hi Jacqueline,

We have received your request and have a follow up question. The event name is listed in the request as the "2014 Capitol Hill Brain Injury Awareness Day." However, on [Congressman Pascrell's Website](#) I see it listed as the "2014 Brain Injury Awareness Day on Capitol Hill." This is also consistent with the title we used in the 2013 message. Can you confirm if we should include "on Capitol Hill" in the title?

Looping research to confirm no vet is necessary.

Thanks,

Ben Ernst  
Associate, Writers & Production | OPC

---

**Feed:** Presidential Messages  
**Posted on:** Thursday, February 06, 2014 2:23 PM  
**Author:** Harris, Jacqueline  
**Subject:** 2014 Capitol Hill Brain Injury Awareness Day

**WH Office requesting::** OLA

**WH point of contact::** Jacqueline Harris

**Commissioned Officer requesting::** Alejandro Perez

**Will any Administration official/staff attend this event?:** Yes. Administration representatives from HRSA, DVBIC have already RSVP's. In the past, DoD, VA, CDC have participated as well. We would expect them to again.

**Are funds raised at this event, or do attendees pay for any part of attendance (meal price, ticket, etc)?::** No funds are raised; and attendees do not pay to participate or attend.

**Event/observation date::** 3/12/2014

**Requested deadline date and time::** 2/26/2014 5:00 PM

**Requesting organization name::** U.S. Reps. Bill Pascrell, Jr. and Thomas J. Rooney

**Exact title of event/observation::** 2014 Capitol Hill Brain Injury Awareness Day

**Organization member (1):** Rep Bill Pascrell, Jr.

**Organization member (2):** Rep. Thomas J. Rooney

**Are there any high-profile/problematic individuals associated with this organization?:** N/A

**Event host or sponsor, if separate than requesting organization::** Congressional Brain Injury Task Force

**List of honorees, including nationalities::** N/A

**Which honorees, if any, should be mentioned?:** N/A

**Please provide us with background on this request and its origin::**

Please see attached letter.

**Recommended talking points::**

Please see attached letter

**Event point of contact::** Alyssa Penna

**Point of contact prefix::** Ms.

**Point of contact salutation::** Alyssa Penna

**Point of contact mailing address::** Washington, D.C.

**How will the Message be used at the event?:** It will be read aloud at the event.

**Has a video message been requested for this event?:** No

**Should a photo be included in the envelope?:** No



Should this message be mailed directly to the recipient or should it be interofficed to an EOP staffer?: Please deliver to OLA in the East Wing, Room 107

**Attachments:** [https://eoportal.eop.gov/who/whcorr/procsmessagescustom/Lists/Presidential Messages/Attachments/1220/Pascrell and Rooney Brain Injury Awareness.pdf](https://eoportal.eop.gov/who/whcorr/procsmessagescustom/Lists/PresidentialMessages/Attachments/1220/Pascrell%20and%20Rooney%20Brain%20Injury%20Awareness.pdf)

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## Burger, Jillian

---

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**Sent:** Monday, February 24, 2014 7:09 PM  
**To:** Sullivan, Sarah  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Correct term is: Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill

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**From:** Harris, Jacqueline  
**Sent:** Monday, February 24, 2014 6:27 PM  
**To:** Sullivan, Sarah  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Hi Sarah,

We're checking on this and will circle back with more information.

Best,  
Jacqueline

---

**From:** Sullivan, Sarah  
**Sent:** Monday, February 24, 2014 5:50 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Hi Jacqueline—I just wanted to double check on the best event title to use. The request lists it as "2014 Capitol Hill Brain Injury Awareness Day." However, in all past years, we have used "Congressional Brain Injury Task Force's Brain Injury Awareness Day." And for the past two years we have included "on Capitol Hill" to read "Congressional Brain Injury Task Force's Brain Injury Awareness Day on Capitol Hill."

Let us know the best name to use!

Thanks,  
Sarah

---

**From:** Harris, Jacqueline  
**Sent:** Friday, February 21, 2014 11:39 AM  
**To:** Sullivan, Sarah; Ernst, Benjamin (Associate); Platkin, Alex  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Thank you!

---

**From:** Sullivan, Sarah  
**Sent:** Friday, February 21, 2014 11:39 AM  
**To:** Harris, Jacqueline; Ernst, Benjamin (Associate); Platkin, Alex







**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Yes, with no vet required, we are aiming to release this by 2/26.

---

**From:** Harris, Jacqueline  
**Sent:** Friday, February 21, 2014 11:38 AM  
**To:** Ernst, Benjamin (Associate); Platkin, Alex  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

To follow up here, can OLA expect to have a message ready on 2/26?

Thanks,  
Jacqueline

---

**From:** Harris, Jacqueline  
**Sent:** Thursday, February 06, 2014 7:13 PM  
**To:** Ernst, Benjamin (Associate); Platkin, Alex  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Not to my knowledge but I defer to the vetting team.

---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 4:07 PM  
**To:** Platkin, Alex; Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

Jacqueline, are there other organizations involved?

Also including the attachment from the request.

---

**From:** Platkin, Alex  
**Sent:** Thursday, February 06, 2014 4:02 PM  
**To:** Ernst, Benjamin (Associate); Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

As long as there is no organization involved, then I don't think we need to vet.

---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 4:02 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

+ Vetting







---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 3:58 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** FW: 2014 Capitol Hill Brain Injury Awareness Day

Hi Jacqueline,

We have received your request and have a follow up question. The event name is listed in the request as the "2014 Capitol Hill Brain Injury Awareness Day." However, on [Congressman Pascrell's Website](#) I see it listed as the "2014 Brain Injury Awareness Day on Capitol Hill." This is also consistent with the title we used in the 2013 message. Can you confirm if we should include "on Capitol Hill" in the title?

Looping research to confirm no vet is necessary.

Thanks,

Ben Ernst  
Associate, Writers & Production | OPC

---

**Feed:** Presidential Messages  
**Posted on:** Thursday, February 06, 2014 2:23 PM  
**Author:** Harris, Jacqueline  
**Subject:** 2014 Capitol Hill Brain Injury Awareness Day

**WH Office requesting::** OLA

**WH point of contact::** Jacqueline Harris

**Commissioned Officer requesting::** Alejandro Perez

**Will any Administration official/staff attend this event?:** Yes. Administration representatives from HRSA, DVBIC have already RSVP's. In the past, DoD, VA, CDC have participated as well. We would expect them to again.

**Are funds raised at this event, or do attendees pay for any part of attendance (meal price, ticket, etc)?::** No funds are raised; and attendees do not pay to participate or attend.

**Event/observation date::** 3/12/2014

**Requested deadline date and time::** 2/26/2014 5:00 PM

**Requesting organization name::** U.S. Reps. Bill Pascrell, Jr. and Thomas J. Rooney

**Exact title of event/observation::** 2014 Capitol Hill Brain Injury Awareness Day

**Organization member (1):** Rep Bill Pascrell, Jr.

**Organization member (2):** Rep. Thomas J. Rooney

**Are there any high-profile/problematic individuals associated with this organization?:** N/A

**Event host or sponsor, if separate than requesting organization::** Congressional Brain Injury Task Force

**List of honorees, including nationalities::** N/A

**Which honorees, if any, should be mentioned?:** N/A

**Please provide us with background on this request and its origin::**

Please see attached letter.

**Recommended talking points::**

Please see attached letter

**Event point of contact::** Alyssa Penna

**Point of contact prefix::** Ms.



**Point of contact salutation::** Alyssa Penna

**Point of contact mailing address::** Washington, D.C.

**How will the Message be used at the event?:** It will be read aloud at the event.

**Has a video message been requested for this event?:** No

**Should a photo be included in the envelope?:** No

**Should this message be mailed directly to the recipient or should it be interofficed to an EOP staffer?:** Please deliver to OLA in the East Wing, Room 107

**Attachments:** [https://eopportal.eop.gov/who/whcorr/procsmessagescustom/Lists/PresidentialMessages/Attachments/1220/Pascrell and Rooney Brain Injury Awareness.pdf](https://eopportal.eop.gov/who/whcorr/procsmessagescustom/Lists/PresidentialMessages/Attachments/1220/Pascrell%20and%20Rooney%20Brain%20Injury%20Awareness.pdf)

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## Burger, Jillian

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**From:** Platkin, Alex  
**Sent:** Thursday, February 06, 2014 4:02 PM  
**To:** Ernst, Benjamin (Associate); Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

As long as there is no organization involved, then I don't think we need to vet.

---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 4:02 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages; DL-WHO-VETTING  
**Subject:** RE: 2014 Capitol Hill Brain Injury Awareness Day

+ Vetting

---

**From:** Ernst, Benjamin (Associate)  
**Sent:** Thursday, February 06, 2014 3:58 PM  
**To:** Harris, Jacqueline  
**Cc:** DL-WHO-Presidential Messages  
**Subject:** FW: 2014 Capitol Hill Brain Injury Awareness Day

Hi Jacqueline,

We have received your request and have a follow up question. The event name is listed in the request as the "2014 Capitol Hill Brain Injury Awareness Day." However, on [Congressman Pascrell's Website](#) I see it listed as the "2014 Brain Injury Awareness Day on Capitol Hill." This is also consistent with the title we used in the 2013 message. Can you confirm if we should include "on Capitol Hill" in the title?

Looping research to confirm no vet is necessary.

Thanks,

Ben Ernst  
Associate, Writers & Production | OPC

---

**Feed:** Presidential Messages  
**Posted on:** Thursday, February 06, 2014 2:23 PM  
**Author:** Harris, Jacqueline  
**Subject:** 2014 Capitol Hill Brain Injury Awareness Day

**WH Office requesting::** OLA

**WH point of contact::** Jacqueline Harris

**Commissioned Officer requesting::** Alejandro Perez

**Will any Administration official/staff attend this event?:** Yes. Administration representatives from HRSA, DVBIC have already RSVP's. In the past, DoD, VA, CDC have participated as well. We would expect them to again.



**Are funds raised at this event, or do attendees pay for any part of attendance (meal price, ticket, etc)?::** No funds are raised; and attendees do not pay to participate or attend.

**Event/observation date::** 3/12/2014

**Requested deadline date and time::** 2/26/2014 5:00 PM

**Requesting organization name::** U.S. Reps. Bill Pascrell, Jr. and Thomas J. Rooney

**Exact title of event/observation::** 2014 Capitol Hill Brain Injury Awareness Day

**Organization member (1):** Rep Bill Pascrell, Jr.

**Organization member (2):** Rep. Thomas J. Rooney

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**Event host or sponsor, if separate than requesting organization::** Congressional Brain Injury Task Force

**List of honorees, including nationalities::** N/A

**Which honorees, if any, should be mentioned?:** N/A

**Please provide us with background on this request and its origin::**

Please see attached letter.

**Recommended talking points::**

Please see attached letter

**Event point of contact::** Alyssa Penna

**Point of contact prefix::** Ms.

**Point of contact salutation::** Alyssa Penna

**Point of contact mailing address::** Washington, D.C.

**How will the Message be used at the event?:** It will be read aloud at the event.

**Has a video message been requested for this event?:** No

**Should a photo be included in the envelope?:** No

**Should this message be mailed directly to the recipient or should it be interofficed to an EOP staffer?:** Please deliver to OLA in the East Wing, Room 107

**Attachments:** [https://eopportal.eop.gov/who/whcorr/procsmessagescustom/Lists/PresidentialMessages/Attachments/1220/Pascrell and Rooney Brain Injury Awareness.pdf](https://eopportal.eop.gov/who/whcorr/procsmessagescustom/Lists/PresidentialMessages/Attachments/1220/Pascrell%20and%20Rooney%20Brain%20Injury%20Awareness.pdf)

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## Prevention

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### What Can I do to Help Prevent Traumatic Brain Injury?

There are many ways to reduce the chances of sustaining a traumatic brain injury, including:

1. Buckling your child in the car using a child safety seat, booster seat, or seat belt ([http://www.cdc.gov/MotorVehicleSafety/Child\\_Passenger\\_Safety/index.html](http://www.cdc.gov/MotorVehicleSafety/Child_Passenger_Safety/index.html)) (according to the child's height, weight, and age).

#### Know the Stages

- ± **Birth up to Age 2 (#birth)**
  - ± **Age 2 up to at least Age 5 (#age2)**
  - ± **Age 5 up to at least Age 9 (#age4)**
  - ± **Once Seat Belts Fit Properly (#age4)**
  - ± **Remember (#remember)**
2. Wearing a seat belt every time you drive or ride in a motor vehicle.
  3. Never driving while under the influence of alcohol or drugs.
  4. Wearing a helmet and making sure your children wear helmets when:
    - Riding a bike, motorcycle (<http://www.cdc.gov/Motorvehiclesafety/mc/index.html>), snowmobile, scooter, or all-terrain vehicle;
    - Playing a contact sport, such as football, ice hockey, or boxing;
    - Using in-line skates or riding a skateboard;
    - Batting and running bases in baseball or softball;
    - Riding a horse; or
    - Skiing or snowboarding.
  5. Making living areas safer for seniors, by:
    - Removing tripping hazards such as throw rugs and clutter in walkways;
    - Using nonslip mats in the bathtub and on shower floors; Installing grab bars next to the toilet and in the tub or shower;
    - Installing handrails on both sides of stairways;
    - Improving lighting throughout the home; and
    - Maintaining a regular physical activity program, if your doctor agrees, to improve lower body strength and balance.<sup>1,2,3</sup>
  6. Making living areas safer for children, by:
    - Installing window guards to keep young children from falling out of open windows; and
    - Using safety gates at the top and bottom of stairs when young children are around.
  7. Making sure the surface on your child's playground is made of shock-absorbing material, such as hardwood mulch or sand.<sup>4</sup>



## Learn More About Preventing

(<http://www.cdc.gov/ParentsAreTheKey/index.html>)

- **Childhood Injuries**

(<http://www.cdc.gov/HomeandRecreationalSafety/index.html>)

- Get educational resources on preventing falls and playground safety (<http://www.cdc.gov/safechild/>)
- Get educational resources on sports-related TBI (<http://www.cdc.gov/concussion/sports>)

- **Injuries from Violence** (<http://www.cdc.gov/ViolencePrevention/>)

- Get educational resources on Shaken Baby Syndrome (<http://www.cdc.gov/concussion/HeadsUp/sbs.html>)
- Get educational resources on youth violence prevention (<http://www.cdc.gov/ViolencePrevention/youthviolence/prevention.html>)

- **Injuries from Motor Vehicle Crashes** (<http://www.cdc.gov/Motorvehiclesafety/index.html>)

- Get educational resources on teen driver safety ([http://www.cdc.gov/Motorvehiclesafety/Teen\\_Drivers/index.html](http://www.cdc.gov/Motorvehiclesafety/Teen_Drivers/index.html))

- **Older Adult Falls** (<http://www.cdc.gov/HomeandRecreationalSafety/Falls/index.html>)

- Get educational resources on TBIs among older adults (<http://www.cdc.gov/traumaticbraininjury/seniors.html>)

Handing your teen the car keys...



## References

1. Judge JO, Lindsey C, Underwood M, Winsemius D. Balance improvements in older women: effects of exercise training. *Physical Therapy* 1993;73(4):254-265.
2. Lord SR, Caplan GA, Ward JA. Balance, reaction time, and muscle strength in exercising older women: a pilot study. *Archives of Physical and Medical Rehabilitation* 1993;74(8):837-839.
3. Campbell AJ, Robertson MC, Gardner MM, Norton RN, Buchner DM. Falls prevention over 2 years: a randomized controlled trial in women 80 years and older. *Age and Aging* 1999;28:513-518.
4. Mack MG, Sacks JJ, Thompson D. Testing the impact attenuation of loose fill playground surfaces. *Injury Prevention* 2000;6:141-144.

## Related Links

- Heads Up: Concussion in Youth Sports (<http://www.cdc.gov/concussion/HeadsUp/youth.html>)
- Heads Up: Concussion in High School Sports ([http://www.cdc.gov/concussion/HeadsUp/high\\_school.html](http://www.cdc.gov/concussion/HeadsUp/high_school.html))
- Heads Up: Brain Injury in Your Practice ([http://www.cdc.gov/concussion/HeadsUp/physicians\\_tool\\_kit.html](http://www.cdc.gov/concussion/HeadsUp/physicians_tool_kit.html))
- Heads Up: Preventing Concussion fact sheet  [PDF-238KB] ([http://www.cdc.gov/concussion/headsup/pdf/Heads\\_Up\\_factsheet\\_english-a.pdf](http://www.cdc.gov/concussion/headsup/pdf/Heads_Up_factsheet_english-a.pdf))

Page last reviewed: April 15, 2013

Page last updated: September 13, 2013

Content source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA  
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## What are the Potential Effects of TBI?

The severity of a TBI may range from “mild,” i.e., a brief change in mental status or consciousness, to “severe,” i.e., an extended period of unconsciousness or amnesia after the injury.

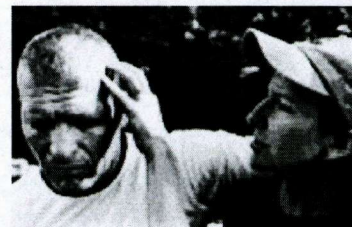
TBI can cause a wide range of functional short- or long-term changes affecting thinking, sensation, language, or emotions.

- **Thinking** (i.e., memory and reasoning);
- **Sensation** (i.e., touch, taste, and smell);
- **Language** (i.e., communication, expression, and understanding); and
- **Emotion** (i.e., depression, anxiety, personality changes, aggression, acting out, and social inappropriateness).<sup>1</sup>

TBI can also cause epilepsy and increase the risk for conditions such as Alzheimer’s disease, Parkinson’s disease, and other brain disorders that become more prevalent with age.<sup>1</sup>

About 75% of TBIs that occur each year are concussions or other forms of mild TBI (</conclusion/index.html>).<sup>2</sup>

Repeated mild TBIs occurring over an extended period of time (i.e., months, years) can result in cumulative neurological and cognitive deficits. Repeated mild TBIs occurring within a short period of time (i.e., hours, days, or weeks) can be catastrophic or fatal.<sup>3</sup>



They train together. They fight together. So if wounded, why shouldn't they go through recovery together? This was the question that Lt. Col. Tim Maxwell asked about his fellow marines being discharged from the hospital and left alone to recover from injuries of war.

[Read more of this story](/traumaticbraininjury/pdf/Lta.pdf) </traumaticbraininjury/pdf/Lta.pdf>

### General Tips to Help Aid in Recovery:

- Get lots of rest. Don't rush back to daily activities such as work or school.
- Avoid doing anything that could cause another blow or jolt to the head.
- Ask your health care professional when it's safe to drive a car, ride a bike, or use heavy equipment, because your ability to react may be slower after a brain injury.
- Take only the drugs your health care professional has approved, and don't drink alcohol until your health care professional says it's OK.
- Write things down if you have a hard time remembering.
- You may need help to re-learn skills that were lost. Your health care professional can help arrange for these services.<sup>4</sup>

### References

1. National Institute of Neurological Disorders and Stroke. Traumatic brain injury: hope through research. Bethesda (MD): National Institutes of Health; 2002 Feb. NIH Publication No.: 02-158.
2. Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control. Report to Congress on mild traumatic brain injury in the United States: steps to prevent a serious public health problem. Atlanta (GA): Centers for Disease Control and Prevention; 2003.
3. Centers for Disease Control and Prevention (CDC). Sports-related recurrent brain injuries—United States. *MMWR* 1997;46(10):224–227.
4. Centers for Disease Control and Prevention (CDC). Facts about concussion and brain injury: Where to Get Help. 2010.

### Related Links

- [Facts about Concussion and Brain Injury: Where to Get Help](/conclusion/get_help.html) ([/conclusion/get\\_help.html](/conclusion/get_help.html))

Page last reviewed: March 8, 2010

Page last updated: September 25, 2012

Content source: [Centers for Disease Control and Prevention](#), [National Center for Injury Prevention and Control](#)

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### Clinical Trials

#### Phase 2 Pediatric Autologous BMMNC for Severe TBI



The purpose of this study is to determine if bone marrow cells can improve outcomes in children with severe TBI.

[More Information »](#)

[See All Trials »](#)

1





## Introduction

Traumatic brain injury (TBI) is a major public health problem, especially among male adolescents and young adults ages 15 to 24, and among elderly people of both sexes 75 years and older. Children aged 5 and younger are also at high risk for TBI.

Perhaps the most famous TBI patient in the history of medicine was Phineas Gage. In 1848, Gage was a 25-year-old railway construction foreman working on the Rutland and Burlington Railroad in Vermont. In the 19th century, little was understood about the brain and even less was known about how to treat injury to it. Most serious injuries to the brain resulted in death due to bleeding or infection. Gage was working with explosive powder and a packing rod, called a tamping iron, when a spark caused an explosion that propelled the 3-foot long, pointed rod through his head. It penetrated his skull at the top of his head, passed through his brain, and exited the skull by his temple. Amazingly, he survived the accident with the help of physician John Harlow who treated Gage for 73 days. Before the accident Gage was a quiet, mild-mannered man; after his injuries he became an obscene, obstinate, self-absorbed man. He continued to suffer personality and behavioral problems until his death in 1861.

Today, we understand a great deal more about the healthy brain and its response to trauma, although science still has much to learn about how to reverse damage resulting from head injuries.

This computer-generated graphic shows how, in 1848, a 3-foot long, pointed rod penetrated the skull of Phineas Gage, a railway construction foreman. The rod entered at the top of his head, passed through his brain, and exited his skull by his temple. Gage survived the accident but suffered lasting personality and behavioral problems.

TBI costs the country more than \$56 billion a year, and more than 5 million Americans alive today have had a TBI resulting in a permanent need for help in performing daily activities. Survivors of TBI are often left with significant cognitive, behavioral, and communicative disabilities, and some patients develop long-term medical complications, such as epilepsy.

Other statistics dramatically tell the story of head injury in the United States. Each year:

- approximately 1.4 million people experience a TBI,
- approximately 50,000 people die from head injury,
- approximately 1 million head-injured people are treated in hospital emergency rooms, and
- approximately 230,000 people are hospitalized for TBI and survive.

## What is a Traumatic Brain Injury?

TBI, a form of acquired brain injury, occurs when a sudden trauma causes damage to the brain. The damage can be focal - confined to one area of the brain - or diffuse - involving more than one area of the brain. TBI can result from a *closed head injury*\* or a *penetrating head injury*. A closed injury occurs when the head suddenly and violently hits an object but the object does not break through the skull. A penetrating injury occurs when an object pierces the skull and enters brain tissue.

\* Terms in *italics* are defined in the [Glossary](#).

## What Are the Signs and Symptoms of TBI?

Symptoms of a TBI can be mild, moderate, or severe, depending on the extent of the damage to the brain. Some symptoms are evident immediately, while others do not surface until several days or weeks after the injury. A person with a mild TBI may remain conscious or may experience a loss of consciousness for a few seconds or minutes. The person may also feel dazed or not like himself for several days or weeks after the initial injury. Other symptoms of mild TBI include headache, confusion, lightheadedness, dizziness, blurred vision or tired eyes, ringing in the ears, bad taste in the mouth, fatigue or lethargy, a change in sleep patterns, behavioral or mood changes, and trouble with memory, concentration, attention, or thinking.

A person with a moderate or severe TBI may show these same symptoms, but may also have a headache that gets worse or does not go away, repeated vomiting or nausea, convulsions or *seizures*, inability to awaken from sleep, dilation of one or both pupils of the eyes, slurred speech, weakness or numbness in the extremities, loss of coordination, and/or increased confusion, restlessness, or agitation. Small children with moderate to severe TBI may show some of these signs as well as signs specific to young children, such as persistent crying, inability to be consoled, and/or refusal to nurse or eat. Anyone with signs of moderate or severe TBI should receive medical attention as soon as possible.

## What Are the Causes of and Risk Factors for TBI

Half of all TBIs are due to transportation accidents involving automobiles, motorcycles, bicycles, and pedestrians. These accidents are the major cause of TBI in people under age 75. For those 75 and older, falls cause the majority of TBIs. Approximately 20 percent of TBIs are due to violence, such as firearm assaults and child abuse, and about 3 percent are due to sports injuries. Fully half of TBI incidents involve alcohol use.

The cause of the TBI plays a role in determining the patient's outcome. For example, approximately 91 percent of firearm TBIs (two-thirds of which may be suicidal in intent) result in death, while only 11 percent of TBIs from falls result in death.



Transportation accidents involving automobiles, motorcycles, bicycles, and pedestrians account for half of all TBIs and are the major cause of TBIs in people under age 75.

## What Are the Different Types of TBI?

*Concussion* is the most minor and the most common type of TBI. Technically, a concussion is a short loss of consciousness in response to a head injury, but in common language the term has come to mean any minor injury to the head or brain.

Other injuries are more severe. As the first line of defense, the skull is particularly vulnerable to injury. Skull fractures occur when the bone of the skull cracks or breaks. A *depressed skull fracture* occurs when pieces of the broken skull press into the tissue of the brain. A *penetrating skull fracture* occurs when something pierces the skull, such as a bullet, leaving a distinct and localized injury to brain tissue.

Skull fractures can cause bruising of brain tissue called a *contusion*. A contusion is a distinct area of swollen brain tissue mixed with blood released from broken blood vessels. A contusion can also occur in response to shaking of the brain back and forth within the confines of the skull, an injury called *contrecoup*. This



injury often occurs in car accidents after high-speed stops and in *shaken baby syndrome*, a severe form of head injury that occurs when a baby is shaken forcibly enough to cause the brain to bounce against the skull. In addition, contrecoup can cause *diffuse axonal injury*, also called *shearing*, which involves damage to individual nerve cells ( *neurons* ) and loss of connections among neurons. This can lead to a breakdown of overall communication among neurons in the brain.

Damage to a major blood vessel in the head can cause a *hematoma*, or heavy bleeding into or around the brain. Three types of hematomas can cause brain damage. An *epidural hematoma* involves bleeding into the area between the skull and the dura. With a *subdural hematoma*, bleeding is confined to the area between the dura and the *arachnoid membrane*. Bleeding within the brain itself is called *intracerebral hematoma*.

Another insult to the brain that can cause injury is *anoxia*. Anoxia is a condition in which there is an absence of oxygen supply to an organ's tissues, even if there is adequate blood flow to the tissue. *Hypoxia* refers to a decrease in oxygen supply rather than a complete absence of oxygen. Without oxygen, the cells of the brain die within several minutes. This type of injury is often seen in neardrowning victims, in heart attack patients, or in people who suffer significant blood loss from other injuries that decrease blood flow to the brain.

### What Medical Care Should a TBI Patient Receive?

Medical care usually begins when paramedics or emergency medical technicians arrive on the scene of an accident or when a TBI patient arrives at the emergency department of a hospital. Because little can be done to reverse the initial brain damage caused by trauma, medical personnel try to stabilize the patient and focus on preventing further injury. Primary concerns include insuring proper oxygen supply to the brain and the rest of the body, maintaining adequate blood flow, and controlling blood pressure. Emergency medical personnel may have to open the patient's airway or perform other procedures to make sure the patient is breathing. They may also perform CPR to help the heart pump blood to the body, and they may treat other injuries to control or stop bleeding. Because many head-injured patients may also have spinal cord injuries, medical professionals take great care in moving and transporting the patient. Ideally, the patient is placed on a back-board and in a neck restraint. These devices immobilize the patient and prevent further injury to the head and spinal cord.

Medical professionals take great care in moving and transporting head-injured patients. Often back-boards and neck restraints are used to immobilize patients and prevent further injury.

As soon as medical personnel have stabilized the head-injured patient, they assess the patient's condition by measuring vital signs and reflexes and by performing a neurological examination. They check the patient's temperature, blood pressure, pulse, breathing rate, and pupil size in response to light. They assess the patient's level of consciousness and neurological functioning using the *Glasgow Coma Scale*, a standardized, 15-point test that uses three measures - eye opening, best verbal response, and best motor response - to determine the severity of the patient's brain injury.

#### Glasgow Coma Scale

The eye opening part of the Glasgow Coma Scale has four scores:

- 4 indicates that the patient can open his eyes spontaneously.
- 3 is given if the patient can open his eyes on verbal command.
- 2 indicates that the patient opens his eyes only in response to painful stimuli.
- 1 is given if the patient does not open his eyes in response to any stimulus.

The best verbal response part of the test has five scores:

- 5 is given if the patient is oriented and can speak coherently.
- 4 indicates that the patient is disoriented but can speak coherently.
- 3 means the patient uses inappropriate words or incoherent language.
- 2 is given if the patient makes incomprehensible sounds.
- 1 indicates that the patient gives no verbal response at all.

The best motor response test has six scores:

- 6 means the patient can move his arms and legs in response to verbal commands.
- A score between 5 and 2 is given if the patient shows movement in response to a variety of stimuli, including pain.
- 1 indicates that the patient shows no movement in response to stimuli.

The results of the three tests are added up to determine the patient's overall condition. A total score of 3 to 8 indicates a severe head injury, 9 to 12 indicates a moderate head injury, and 13 to 15 indicates a mild head injury.

Imaging tests help in determining the diagnosis and prognosis of a TBI patient. Patients with mild to moderate injuries may receive skull and neck X-rays to check for bone fractures or spinal instability. The patient should remain immobilized in a neck and back restraint until medical personnel are certain that there is no risk of spinal cord injury. For moderate to severe cases, the gold standard imaging test is a *computed tomography (CT)* scan. The CT scan creates a series of crosssectional X-ray images of the head and brain and can show bone fractures as well as the presence of hemorrhage, hematomas, contusions, brain tissue swelling, and tumors. *Magnetic resonance imaging (MRI)* may be used after the initial assessment and treatment of the TBI patient. MRI uses magnetic fields to detect subtle changes in brain tissue content and can show more detail than X-rays or CT. Unfortunately, MRI is not ideal for routine emergency imaging of TBI patients because it is time-consuming and is not available in all hospitals.

Approximately half of severely head-injured patients will need surgery to remove or repair hematomas or contusions. Patients may also need surgery to treat injuries in other parts of the body. These patients usually go to the intensive care unit after surgery.

Sometimes when the brain is injured swelling occurs and fluids accumulate within the brain space. It is normal for bodily injuries to cause swelling and disruptions in fluid balance. But when an injury occurs inside the skull-encased brain, there is no place for swollen tissues to expand and no adjoining tissues to absorb excess fluid. This increased pressure is called *intracranialpressure (ICP)*.

Medical personnel measure patients' ICP using a probe or catheter. The instrument is inserted through the skull to the subarachnoid level and is connected to a monitor that registers the patient's ICP. If a patient has high ICP, he or she may undergo a *ventriculostomy*, a procedure that drains *cerebrospinal fluid (CSF)* from the brain to bring the pressure down. Drugs that can be used to decrease ICP include mannitol or barbiturates, although the safety and effectiveness of the latter are unknown.



A computed tomography scan creates X-ray images of the head and brain. This imaging test can show bone fractures, hemorrhages, hematomas, contusions, brain tissue swelling, and tumors, and can help determine the prognosis of TBI patients.



## How Does a TBI Affect Consciousness?

A TBI can cause problems with arousal, consciousness, awareness, alertness, and responsiveness. Generally, there are five abnormal states of consciousness that can result from a TBI: stupor, coma, persistent vegetative state, locked-in syndrome, and brain death.

*Stupor* is a state in which the patient is unresponsive but can be aroused briefly by a strong stimulus, such as sharp pain. *Coma* is a state in which the patient is totally unconscious, unresponsive, unaware, and unarousable. Patients in a coma do not respond to external stimuli, such as pain or light, and do not have sleep-wake cycles. Coma results from widespread and diffuse trauma to the brain, including the cerebral hemispheres of the upper brain and the lower brain or brainstem. Coma generally is of short duration, lasting a few days to a few weeks. After this time, some patients gradually come out of the coma, some progress to a vegetative state, and others die.

Patients in a *vegetative* state are unconscious and unaware of their surroundings, but they continue to have a sleep-wake cycle and can have periods of alertness. Unlike coma, where the patients' eyes are closed, patients in a vegetative state often open their eyes and may move, groan, or show reflex responses. A vegetative state can result from diffuse injury to the cerebral hemispheres of the brain without damage to the lower brain and brainstem. Anoxia, or lack of oxygen to the brain, which is a common complication of cardiac arrest, can also bring about a vegetative state.

Many patients emerge from a vegetative state within a few weeks, but those who do not recover within 30 days are said to be in a *persistent vegetative state (PVS)*. The chances of recovery depend on the extent of injury to the brain and the patient's age, with younger patients having a better chance of recovery than older patients. Generally adults have a 50 percent chance and children a 60 percent chance of recovering consciousness from a PVS within the first 6 months. After a year, the chances that a PVS patient will regain consciousness are very low and most patients who do recover consciousness experience significant disability. The longer a patient is in a PVS, the more severe the resulting disabilities will be. Rehabilitation can contribute to recovery, but many patients never progress to the point of being able to take care of themselves.

*Locked-in syndrome* is a condition in which a patient is aware and awake, but cannot move or communicate due to complete paralysis of the body.

**Advances in imaging and other technologies have led to devices that help differentiate among the variety of unconscious states.**

Unlike PVS, in which the upper portions of the brain are damaged and the lower portions are spared, locked-in syndrome is caused by damage to specific portions of the lower brain and brainstem with no damage to the upper brain. Most locked-in syndrome patients can communicate through movements and blinking of their eyes, which are not affected by the paralysis. Some patients may have the ability to move certain facial muscles as well. The majority of locked-in syndrome patients do not regain motor control, but several devices are available to help patients communicate.

With the development over the last half-century of assistive devices that can artificially maintain blood flow and breathing, the term *brain death* has come into use. Brain death is the lack of measurable brain function due to diffuse damage to the cerebral hemispheres and the brainstem, with loss of any integrated activity among distinct areas of the brain. Brain death is irreversible. Removal of assistive devices will result in immediate cardiac arrest and cessation of breathing.

Advances in imaging and other technologies have led to devices that help differentiate among the variety of unconscious states. For example, an imaging test that shows activity in the brainstem but little or no activity in the upper brain would lead a physician to a diagnosis of vegetative state and exclude diagnoses of brain death and locked-in syndrome. On the other hand, an imaging test that shows activity in the upper brain with little activity in the brainstem would confirm a diagnosis of locked-in syndrome, while invalidating a diagnosis of brain death or vegetative state. The use of CT and MRI is standard in TBI treatment, but other imaging and diagnostic techniques that may be used to confirm a particular diagnosis include cerebral angiography, electroencephalography (EEG), transcranial Doppler ultrasound, and single photon emission computed tomography (SPECT).

## What Immediate Post-Injury Complications Can Occur From a TBI?

Sometimes, health complications occur in the period immediately following a TBI. These complications are not types of TBI, but are distinct medical problems that arise as a result of the injury. Although complications are rare, the risk increases with the severity of the trauma. Complications of TBI include immediate seizures, hydrocephalus or post-traumatic ventricular enlargement, CSF leaks, infections, vascular injuries, cranial nerve injuries, pain, bed sores, multiple organ system failure in unconscious patients, and polytrauma (trauma to other parts of the body in addition to the brain).

About 25 percent of patients with brain contusions or hematomas and about 50 percent of patients with penetrating head injuries will develop *immediate seizures*, seizures that occur within the first 24 hours of the injury. These immediate seizures increase the risk of *early seizures* - defined as seizures occurring within 1 week after injury - but do not seem to be linked to the development of *post-traumatic epilepsy* (recurrent seizures occurring more than 1 week after the initial trauma). Generally, medical professionals use anticonvulsant medications to treat seizures in TBI patients only if the seizures persist.

A medical technician carefully monitors a patient undergoing an electroencephalogram, a diagnostic technique used to detect abnormalities in brain waves.

Hydrocephalus or post-traumatic ventricular enlargement occurs when CSF accumulates in the brain resulting in dilation of the cerebral ventricles (cavities in the brain filled with CSF) and an increase in ICP. This condition can develop during the acute stage of TBI or may not appear until later. Generally it occurs within the first year of the injury and is characterized by worsening neurological outcome, impaired consciousness, behavioral changes, ataxia (lack of coordination or balance), incontinence, or signs of elevated ICP. The condition may develop as a result of *meningitis*, subarachnoid hemorrhage, intracranial hematoma, or other injuries. Treatment includes shunting and draining of CSF as well as any other appropriate treatment for the root cause of the condition.

Skull fractures can tear the membranes that cover the brain, leading to CSF leaks. A tear between the dura and the arachnoid membranes, called a *CSF fistula*, can cause CSF to leak out of the subarachnoid space into the subdural space; this is called a *subdural hygroma*. CSF can also leak from the nose and the ear. These tears that let CSF out of the brain cavity can also allow air and bacteria into the cavity, possibly causing infections such as meningitis. *Pneumocephalus* occurs when air enters the intracranial cavity and becomes trapped in the subarachnoid space.

Infections within the intracranial cavity are a dangerous complication of TBI. They may occur outside of the dura, below the dura, below the arachnoid (meningitis), or within the space of the brain itself (abscess). Most of these injuries develop within a few weeks of the initial trauma and result from skull fractures or penetrating injuries. Standard treatment involves antibiotics and sometimes surgery to remove the infected tissue. Meningitis may be especially dangerous, with the potential to spread to the rest of the brain and nervous system.

Any damage to the head or brain usually results in some damage to the vascular system, which provides blood to the cells of the brain. The body's immune system can repair damage to small blood vessels, but damage to larger vessels can result in serious complications. Damage to one of the major arteries leading to the brain can cause a stroke, either through bleeding from the artery (*hemorrhagic stroke*) or through the formation of a clot at the site of injury, called a *thrombus* or *thrombosis*, blocking blood flow to the brain (*ischemic stroke*). Blood clots also can develop in other parts of the head. Symptoms such as headache, vomiting, seizures, paralysis on one side of the body, and semi-consciousness developing within several days of a head injury may be caused by a blood clot that forms in the tissue of one of the sinuses, or cavities, adjacent to the brain. Thrombotic-ischemic strokes are treated with anticoagulants, while surgery is the preferred treatment for hemorrhagic stroke. Other types of vascular injuries include *vasospasm* and the formation of *aneurysms*.

Skull fractures, especially at the base of the skull, can cause cranial nerve injuries that result in *compressive cranial neuropathies*. All but three of the 12 cranial



nerves project out from the brainstem to the head and face. The seventh cranial nerve, called the facial nerve, is the most commonly injured cranial nerve in TBI and damage to it can result in paralysis of facial muscles.

Pain is a common symptom of TBI and can be a significant complication for conscious patients in the period immediately following a TBI. Headache is the most common form of pain experienced by TBI patients, but other forms of pain can also be problematic. Serious complications for patients who are unconscious, in a coma, or in a vegetative state include bed or pressure sores of the skin, recurrent bladder infections, pneumonia or other life-threatening infections, and progressive multiple organ failure.

### General Trauma

Most TBI patients have injuries to other parts of the body in addition to the head and brain. Physicians call this polytrauma. These injuries require immediate and specialized care and can complicate treatment of and recovery from the TBI. Other medical complications that may accompany a TBI include pulmonary (lung) dysfunction; cardiovascular (heart) dysfunction from blunt chest trauma; gastrointestinal dysfunction; fluid and hormonal imbalances; and other isolated complications, such as fractures, nerve injuries, *deep vein thrombosis*, excessive blood clotting, and infections.

In addition to head and brain injuries, most TBI patients have injuries in other parts of the body - a condition called polytrauma. The formation of blood clots deep inside a vein (shown above), referred to as *deep vein thrombosis*, is one of the many medical complications that may occur with TBI.

Trauma victims often develop *hypermetabolism* or an increased metabolic rate, which leads to an increase in the amount of heat the body produces. The body redirects into heat the energy needed to keep organ systems functioning, causing muscle wasting and the starvation of other tissues. Complications related to pulmonary dysfunction can include neurogenic pulmonary edema (excess fluid in lung tissue), aspiration pneumonia (pneumonia caused by foreign matter in the lungs), and fat and blood clots in the blood vessels of the lungs.

Fluid and hormonal imbalances can complicate the treatment of hypermetabolism and high ICP. Hormonal problems can result from dysfunction of the pituitary, the thyroid, and other glands throughout the body. Two common hormonal complications of TBI are *syndrome of inappropriate secretion of antidiuretic hormone (SIADH)*

and *hypothyroidism*.

Blunt trauma to the chest can also cause cardiovascular problems, including damage to blood vessels and internal bleeding, and problems with heart rate and blood flow. Blunt trauma to the abdomen can cause damage to or dysfunction of the stomach, large or small intestines, and pancreas. A serious and common complication of TBI is *erosive gastritis*, or inflammation and degeneration of stomach tissue. This syndrome can cause bacterial growth in the stomach, increasing the risk of aspiration pneumonia. Standard care of TBI patients includes administration of prophylactic gastric acid inhibitors to prevent the buildup of stomach acids and bacteria.

### What Disabilities Can Result From a TBI?

Disabilities resulting from a TBI depend upon the severity of the injury, the location of the injury, and the age and general health of the patient. Some common disabilities include problems with cognition (thinking, memory, and reasoning), sensory processing (sight, hearing, touch, taste, and smell), communication (expression and understanding), and behavior or mental health (depression, anxiety, personality changes, aggression, acting out, and social inappropriateness).

Within days to weeks of the head injury approximately 40 percent of TBI patients develop a host of troubling symptoms collectively called *postconcussion syndrome (PCS)*. A patient need not have suffered a concussion or loss of consciousness to develop the syndrome and many patients with mild TBI suffer from PCS. Symptoms include headache, dizziness, vertigo (a sensation of spinning around or of objects spinning around the patient), memory problems, trouble concentrating, sleeping problems, restlessness, irritability, apathy, depression, and anxiety. These symptoms may last for a few weeks after the head injury. The syndrome is more prevalent in patients who had psychiatric symptoms, such as depression or anxiety, before the injury. Treatment for PCS may include medicines for pain and psychiatric conditions, and psychotherapy and occupational therapy to develop coping skills.

Cognition is a term used to describe the processes of thinking, reasoning, problem solving, information processing, and memory. Most patients with severe TBI, if they recover consciousness, suffer from cognitive disabilities, including the loss of many higher level mental skills. The most common cognitive impairment among severely head-injured patients is memory loss, characterized by some loss of specific memories and the partial inability to form or store new ones. Some of these patients may experience *post-traumatic amnesia (PTA)*, either anterograde or retrograde. Anterograde PTA is impaired memory of events that happened after the TBI, while retrograde PTA is impaired memory of events that happened before the TBI.

Many patients with mild to moderate head injuries who experience cognitive deficits become easily confused or distracted and have problems with concentration and attention. They also have problems with higher level, so-called executive functions, such as planning, organizing, abstract reasoning, problem solving, and making judgments, which may make it difficult to resume pre-injury work-related activities. Recovery from cognitive deficits is greatest within the first 6 months after the injury and more gradual after that.

**The most common cognitive impairment among severely head-injured patients is memory loss, characterized by some loss of specific memories and the partial inability to form or store new ones.**

Patients with moderate to severe TBI have more problems with cognitive deficits than patients with mild TBI, but a history of several mild TBIs may have an additive effect, causing cognitive deficits equal to a moderate or severe injury.

Many TBI patients have sensory problems, especially problems with vision. Patients may not be able to register what they are seeing or may be slow to recognize objects. Also, TBI patients often have difficulty with hand-eye coordination. Because of this, TBI patients may be prone to bumping into or dropping objects, or may seem generally unsteady. TBI patients may have difficulty driving a car, working complex machinery, or playing sports. Other sensory deficits may include problems with hearing, smell, taste, or touch. Some TBI patients develop tinnitus, a ringing or roaring in the ears. A person with damage to the part of the brain that processes taste or smell may develop a persistent bitter taste in the mouth or perceive a persistent noxious smell. Damage to the part of the brain that controls the sense of touch may cause a TBI patient to develop persistent skin tingling, itching, or pain. Although rare, these conditions are hard to treat.

Language and communication problems are common disabilities in TBI patients. Some may experience *aphasia*, defined as difficulty with understanding and producing spoken and written language; others may have difficulty with the more subtle aspects of communication, such as body language and emotional, non-verbal signals.

In *non-fluent aphasia*, also called Broca's aphasia or motor aphasia, TBI patients often have trouble recalling words and speaking in complete sentences. They may speak in broken phrases and pause frequently. Most patients are aware of these deficits and may become extremely frustrated. Patients with *fluent aphasia*, also called Wernicke's aphasia or sensory aphasia, display little meaning in their speech, even though they speak in complete sentences and use correct grammar. Instead, they speak in flowing gibberish, drawing out their sentences with non-essential and invented words. Many patients with fluent aphasia are unaware that they make little sense and become angry with others for not understanding them. Patients with *global aphasia* have extensive damage to the portions of the brain responsible for language and often suffer severe communication disabilities.

TBI patients may have problems with spoken language if the part of the brain that controls speech muscles is damaged. In this disorder, called *dysarthria*, the patient can think of the appropriate language, but cannot easily speak the words because they are unable to use the muscles needed to form the words and produce the sounds. Speech is often slow, slurred, and garbled. Some may have problems with intonation or inflection, called *prosodic dysfunction*. An important aspect of speech, inflection conveys emotional meaning and is necessary for certain aspects of language, such as irony.



Communication disabilities such as language and speech problems are common among TBI patients. Above, a speech therapist uses a mirror in her work, performing exercises to help a patient relearn speaking skills.

Most TBI patients have emotional or behavioral problems that fit under the broad category of psychiatric health. Family members of TBI patients often find that personality changes and behavioral problems are the most difficult disabilities to handle. Psychiatric problems that may surface include depression, apathy, anxiety, irritability, anger, paranoia, confusion, frustration, agitation, insomnia or other sleep problems, and mood swings. Problem behaviors may include aggression and violence, impulsivity, disinhibition, acting out, noncompliance, social inappropriateness, emotional outbursts, childish behavior, impaired self-control, impaired self awareness, inability to take responsibility or accept criticism, egocentrism, inappropriate sexual activity, and alcohol or drug abuse/addiction. Some patients' personality problems may be so severe that they are diagnosed with borderline personality disorder, a psychiatric condition characterized by many of the problems mentioned above. Sometimes TBI patients suffer from developmental stagnation, meaning that they fail to mature emotionally, socially, or psychologically after the trauma. This is a serious problem for children and young adults who suffer from a TBI. Attitudes and behaviors that are appropriate for a child or teenager become inappropriate in adulthood. Many TBI patients who show psychiatric or behavioral problems can be helped with medication and psychotherapy.

## Are There Other Long-Term Problems Associated With a TBI?

In addition to the immediate post-injury complications discussed on page 13, other long-term problems can develop after a TBI. These include Parkinson's disease and other motor problems, Alzheimer's disease, *dementia pugilistica*, and post-traumatic dementia.

**Alzheimer's disease (AD)** - AD is a progressive, neurodegenerative disease characterized by dementia, memory loss, and deteriorating cognitive abilities. Recent research suggests an association between head injury in early adulthood and the development of AD later in life; the more severe the head injury, the greater the risk of developing AD. Some evidence indicates that a head injury may interact with other factors to trigger the disease and may hasten the onset of the disease in individuals already at risk. For example, people who have a particular form of the protein apolipoprotein E (apoE4) and suffer a head injury fall into this increased risk category. (ApoE4 is a naturally occurring protein that helps transport cholesterol through the bloodstream.)

**Parkinson's disease and other motor problems** - Movement disorders as a result of TBI are rare but can occur. Parkinson's disease may develop years after TBI as a result of damage to the basal ganglia. Symptoms of Parkinson's disease include tremor or trembling, rigidity or stiffness, slow movement (bradykinesia), inability to move (akinesia), shuffling walk, and stooped posture. Despite many scientific advances in recent years, Parkinson's disease remains a chronic and progressive disorder, meaning that it is incurable and will progress in severity until the end of life. Other movement disorders that may develop after TBI include tremor, ataxia (uncoordinated muscle movements), and myoclonus (shock-like contractions of muscles).

**Dementia pugilistica** - Also called chronic traumatic encephalopathy, dementia pugilistica primarily affects career boxers. The most common symptoms of the condition are dementia and parkinsonism caused by repetitive blows to the head over a long period of time. Symptoms begin anywhere between 6 and 40 years after the start of a boxing career, with an average onset of about 16 years.

**Post-traumatic dementia** - The symptoms of post-traumatic dementia are very similar to those of dementia pugilistica, except that post-traumatic dementia is also characterized by long-term memory problems and is caused by a single, severe TBI that results in a coma.

Dementia pugilistica is a condition caused by repetitive blows to the head over a long period of time. Symptoms of the disorder, which primarily affects career boxers, include dementia and parkinsonism.

## What Kinds of Rehabilitation Should a TBI Patient Receive?

Rehabilitation is an important part of the recovery process for a TBI patient. During the acute stage, moderately to severely injured patients may receive treatment and care in an intensive care unit of a hospital. Once stable, the patient may be transferred to a subacute unit of the medical center or to an independent rehabilitation hospital. At this point, patients follow many diverse paths toward recovery because there are a wide variety of options for rehabilitation.

Testing by a trained neuropsychologist can assess the individual's cognitive, language, behavioral, motor, and executive functions and provide information regarding the need for rehabilitative services.

In 1998, the NIH held a *Consensus Development Conference on Rehabilitation of Persons with Traumatic Brain Injury*. The Consensus Development Panel recommended that TBI patients receive an individualized rehabilitation program based upon the patient's strengths and capacities and that rehabilitation services should be modified over time to adapt to the patient's changing needs.\* The panel also recommended that moderately to severely injured patients receive rehabilitation treatment that draws on the skills of many specialists. This involves individually tailored treatment programs in the areas of physical therapy, occupational therapy, speech/language therapy, physiatry (physical medicine), psychology/psychiatry, and social support. Medical personnel who provide this care include rehabilitation specialists, such as rehabilitation nurses, psychologists, speech/language pathologists, physical and occupational therapists, physiatrists (physical medicine specialists), social workers, and a team coordinator or administrator.

\* National Institutes of Health Consensus Development Conference Statement, October 26-28, 1998. Rehabilitation of Persons with Traumatic Brain Injury. Bethesda, MD, September 1999.

Rehabilitation therapy is an important part of the recovery process of TBI patients. Above, a physical therapist works with a patient to help improve her ability to walk.

Some patients may need medication for psychiatric and physical problems resulting from the TBI. Great care must be taken in prescribing medications because TBI patients are more susceptible to side effects and may react adversely to some pharmacological agents. It is important for the family to provide social support for the patient by being involved in the rehabilitation program. Family members may also benefit from psychotherapy.

It is important for TBI patients and their families to select the most appropriate setting for rehabilitation. There are several options, including home-based rehabilitation, hospital outpatient rehabilitation, inpatient rehabilitation centers, comprehensive day programs at rehabilitation centers, supportive living programs, independent living centers, club-house programs, school based programs for children, and others. The TBI patient, the family, and the rehabilitation team members should work together to find the best place for the patient to recover.

## How Can TBI be Prevented?



Unlike most neurological disorders, head injuries can be prevented. The Centers for Disease Control and Prevention (CDC) have issued the following safety tips\* for reducing the risk of suffering a TBI.

- Wear a seatbelt every time you drive or ride in a car.
- Buckle your child into a child safety seat, booster seat, or seatbelt (depending on the child's age) every time the child rides in a car.
- Wear a helmet and make sure your children wear helmets when
  - riding a bike or motorcycle;
  - playing a contact sport such as football or ice hockey;
  - using in-line skates or riding a skateboard;
  - batting and running bases in baseball or softball;
  - riding a horse;
  - skiing or snowboarding.
- Keep firearms and bullets stored in a locked cabinet when not in use.
- Avoid falls by
  - using a step-stool with a grab bar to reach objects on high shelves;
  - installing handrails on stairways;
  - installing window guards to keep young children from falling out of open windows;
  - using safety gates at the top and bottom of stairs when young children are around.
- Make sure the surface on your child's playground is made of shock-absorbing material (e.g., hardwood mulch, sand).

\*From the CDC, Department of Health and Human Services ([http://www.cdc.gov/ncipc/pub-res/tbi\\_toolkit/patients/preventing.htm](http://www.cdc.gov/ncipc/pub-res/tbi_toolkit/patients/preventing.htm)).

Certain precautions, such as wearing a helmet when riding a bicycle or motorcycle and wearing a seatbelt when driving or riding in a car, greatly reduce the risk of TBI.

## What Research is the NINDS Conducting?

The National Institute of Neurological Disorders and Stroke (NINDS) conducts and supports research to better understand CNS injury and the biological mechanisms underlying damage to the brain, to develop strategies and interventions to limit the primary and secondary brain damage that occurs within days of a head trauma, and to devise therapies to treat brain injury and help in long-term recovery of function.

On a microscopic scale, the brain is made up of billions of cells that interconnect and communicate.

NINDS grantees developed a device that simulates the condition of trauma in cells in culture. The device allows researchers to control the degree of injury to the cells and then study the biological and physiological responses those cells have to trauma. The device can also serve as a tool to test the effects of pharmaceutical agents.

messengers called *neurotransmitters* into the synapse or space between neurons, damaging neighboring neurons through a secondary neuroexcitatory cascade. Therefore, neurons that were unharmed from the primary trauma suffer damage from this secondary insult. Many of these cells cannot survive the toxicity of the chemical onslaught and initiate programmed cell death, or *apoptosis*. This process usually takes place within the first 24 to 48 hours after the initial injury, but can be prolonged.

One area of research that shows promise is the study of the role of calcium ion influx into the damaged neuron as a cause of cell death and general brain tissue swelling. Calcium enters nerve cells through damaged channels in the axon's membrane. The excess calcium inside the cell causes the axon to swell and also activates chemicals, called proteases, that break down proteins. One family of proteases, the calpains, are especially damaging to nerve cells because they break down proteins that maintain the structure of the axon. Excess calcium within the cell is also destructive to the cell's mitochondria, structures that produce the cell's energy. Mitochondria soak up excess calcium until they swell and stop functioning. If enough mitochondria are damaged, the nerve cell degenerates. Calcium influx has other damaging effects: it activates destructive enzymes, such as caspases that damage the DNA in the cell and trigger programmed cell death, and it damages sodium channels in the cell membrane, allowing sodium ions to flood the cell as well. Sodium influx exacerbates swelling of the cell body and axon.

NINDS researchers have shown, in both cell and animal studies, that giving specialized chemicals can reduce cell death caused by calcium ion influx. Other researchers have shown that the use of cyclosporin A, which blocks mitochondrial membrane permeability, protects axons from calcium influx. Another avenue of therapeutic intervention is the use of hypothermia (an induced state of low body temperature) to slow the progression of cell death and axon swelling.

A researcher studies an image generated by an immunofluorescent microscope to understand cell death in the hippocampus, the section of the brain that controls memory. The hippocampus is frequently affected in TBI patients. This technology allows the researchers to study what happens to injured cells at the molecular level, and to look for ways to interrupt the chain of chemical events that causes permanent brain damage after a severe head injury.

In the healthy brain, the chemical glutamate functions as a neurotransmitter, but an excess amount of glutamate in the brain causes neurons to quickly overload from too much excitation, releasing toxic chemicals. These substances poison the chemical environment of surrounding cells, initiating degeneration and programmed cell death. Studies have shown that a group of enzymes called matrix metalloproteinases contribute to the toxicity by breaking down proteins that maintain the structure and order of the extracellular environment. Other research shows that glutamate reacts with calcium and sodium ion channels on the cell membrane, leading to an influx of calcium and sodium ions into the cell. Investigators are looking for ways to decrease the toxic effects of glutamate and other excitatory neurotransmitters.

The brain attempts to repair itself after a trauma, and is more successful after mild to moderate injury than after severe injury. Scientists have shown that after diffuse axonal injury neurons can spontaneously adapt and recover by sprouting some of the remaining healthy fibers of the neuron into the spaces once occupied by the degenerated axon. These fibers can develop in such a way that the neuron can resume communication with neighboring neurons. This is a very delicate process and can be disrupted by any of a number of factors, such as *neuroexcitation*, hypoxia (low oxygen levels), and hypotension (low blood flow). Following trauma, excessive neuroexcitation, that is the electrical activation of nerve cells or fibers, especially disrupts this natural recovery process and can cause sprouting fibers to lose direction and connect with the wrong terminals.

Scientists suspect that these misconnections may contribute to some long-term disabilities, such as pain, spasticity, seizures, and memory problems. NINDS researchers are trying to learn more about the brain's natural recovery process and what factors or triggers control it. They hope that through manipulation of these



triggers they can increase repair while decreasing misconceptions.

NINDS investigators are also looking at larger, tissue-specific changes within the brain after a TBI. Researchers have shown that trauma to the frontal lobes of the brain can damage specific chemical messenger systems, specifically the dopaminergic system, the collection of neurons in the brain that uses the neurotransmitter dopamine. Dopamine is an important chemical messenger - for example, degeneration of dopamine-producing neurons is the primary cause of Parkinson's disease. NINDS researchers are studying how the dopaminergic system responds after a TBI and its relationship to neurodegeneration and Parkinson's disease.

The use of stem cells to repair or replace damaged brain tissue is a new and exciting avenue of research. A *neural stem cell* is a special kind of cell that can multiply and give rise to other more specialized cell types. These cells are found in adult neural tissue and normally develop into several different cell types found within the central nervous system. NINDS researchers are investigating the ability of stem cells to develop into neurotransmitter-producing neurons, specifically dopamine-producing cells. Researchers are also looking at the power of stem cells to develop into *oligodendrocytes*, a type of brain cell that produces myelin, the fatty sheath that surrounds and insulates axons. One study in mice has shown that bone marrow stem cells can develop into neurons, demonstrating that neural stem cells are not the only type of stem cell that could be beneficial in the treatment of brain and nervous system disorders. At the moment, stem cell research for TBI is in its infancy, but future research may lead to advances for treatment and rehabilitation.

In addition to the basic research described above, NINDS scientists also conduct broader based clinical research involving patients. One area of study focuses on the *plasticity* of the brain after injury. In the strictest sense, plasticity means the ability to be formed or molded. When speaking of the brain, plasticity means the ability of the brain to adapt to deficits and injury. NINDS researchers are investigating the extent of brain plasticity after injury and developing therapies to enhance plasticity as a means of restoring function.

The plasticity of the brain and the rewiring of neural connections make it possible for one part of the brain to take up the functions of a disabled part. Scientists have long known that the immature brain is generally more plastic than the mature brain, and that the brains of children are better able to adapt and recover from injury than the brains of adults. NINDS researchers are investigating the mechanisms underlying this difference and theorize that children have an overabundance of hard-wired neural networks, many of which naturally decrease through a process called *pruning*. When an injury destroys an important neural network in children, another less useful neural network that would have eventually died takes over the responsibilities of the damaged network. Some researchers are looking at the role of plasticity in memory, while others are using imaging technologies, such as functional MRI, to map regions of the brain and record evidence of plasticity.

**In the strictest sense, plasticity means the ability to be formed or molded. When speaking of the brain, plasticity means the ability of the brain to adapt to deficits and injury.**

Another important area of research involves the development of improved rehabilitation programs for those who have disabilities from a TBI. The Congressional Children's Health Act of 2000 authorized the NINDS to conduct and support research related to TBI with the goal of designing therapies to restore normal functioning in cognition and behavior.

#### Clinical Trials Research

The NINDS works to develop treatments that can be given in the first hours after a TBI, hoping that quick action can prevent or reverse much of the brain damage resulting from the injury. A recently completed NINDS-supported clinical trial involved lowering body temperature in TBI patients to 33 degrees Celcius within 8 hours of the trauma. Although the investigators found that the treatment did not improve outcome overall, they did learn that patients younger than 45 years who were admitted to the hospital already in a hypothermic state fared better if they were kept cool than if they were brought to normal body temperature. Other ongoing clinical trials include the use of hypothermia for severe TBI in children, the use of magnesium sulfate to protect nerve cells after TBI, and the effects of lowering ICP and increasing cerebral blood flow.

#### Where can I get more information?

For more information on neurological disorders or research programs funded by the National Institute of Neurological Disorders and Stroke, contact the Institute's Brain Resources and Information Network (BRAIN) at:

BRAIN  
P.O. Box 5801  
Bethesda, MD 20824  
(800) 352-9424  
<http://www.ninds.nih.gov>

Information also is available from the following organizations:

Acoustic Neuroma Association  
600 Peachtree Parkway  
Suite 108  
Cumming, GA 30041  
[info@anaua.org](mailto:info@anaua.org)  
<http://www.anaua.org>  
Tel: 770-205-8211 877-200-8211  
Fax: 770-205-0239/877-202-0239

Brain Trauma Foundation  
7 World Trade Center 250 Greenwich Street  
34th Floor  
New York, NY 10017  
[education@braintrauma.org](mailto:education@braintrauma.org)  
<http://www.braintrauma.org>  
Tel: 212-772-0608  
Fax: 212-772-0357

National Rehabilitation Information Center (NARIC)  
8201 Corporate Drive  
Suite 600  
Landover, MD 20785  
[naricinfo@heltechservices.com](mailto:naricinfo@heltechservices.com)  
<http://www.naric.com>  
Tel: 301-459-5900/301-459-5984 (TTY) 800-346-2742  
Fax: 301-562-2401

National Institute on Disability and Rehabilitation Research (NIDRR)

Brain Injury Association of America, Inc.  
1608 Spring Hill Rd  
Suite 110  
Vienna, VA 22182  
[braininjuryinfo@biausa.org](mailto:braininjuryinfo@biausa.org)  
<http://www.biausa.org>  
Tel: 703-761-0750 800-444-6443  
Fax: 703-761-0755

Family Caregiver Alliance/ National Center on Caregiving  
785 Market St.  
Suite 750  
San Francisco, CA 94103  
[info@caregiver.org](mailto:info@caregiver.org)  
<http://www.caregiver.org>  
Tel: 415-434-3388 800-445-8106  
Fax: 415-434-3508

National Stroke Association  
9707 East Easter Lane  
Suite B  
Centennial, CO 80112-3747  
[info@stroke.org](mailto:info@stroke.org)  
<http://www.stroke.org>  
Tel: 303-649-9299 800-STROKES (787-6537)  
Fax: 303-649-1328



U.S. Department of Education Office of Special Education and Rehabilitative Services  
400 Maryland Ave., S.W.  
Washington, DC 20202-7100  
<http://www.ed.gov/about/offices/list/oseers/nidrr>  
Tel: 202-245-7460 202-245-7316 (TTY)

## Glossary

- aneurysm** - a blood-filled sac formed by disease related stretching of an artery or blood vessel.
- anoxia** - an absence of oxygen supply to an organ's tissues leading to cell death.
- aphasia** - difficulty understanding and/or producing spoken and written language. ( See also non-fluent aphasia.)
- apoptosis** - cell death that occurs naturally as part of normal development, maintenance, and renewal of tissues within an organism.
- arachnoid membrane** - one of the three membranes that cover the brain; it is between the pia mater and the dura. Collectively, these three membranes form the meninges.
- brain death** - an irreversible cessation of measurable brain function.
- Broca's aphasia** - see non-fluent aphasia.
- cerebrospinal fluid (CSF)** - the fluid that bathes and protects the brain and spinal cord.
- closed head injury** - an injury that occurs when the head suddenly and violently hits an object but the object does not break through the skull.
- coma** - a state of profound unconsciousness caused by disease, injury, or poison.
- compressive cranial neuropathies** - degeneration of nerves in the brain caused by pressure on those nerves.
- computed tomography (CT)** - a scan that creates a series of cross-sectional X-rays of the head and brain; also called computerized axial tomography or CAT scan.
- concussion** - injury to the brain caused by a hard blow or violent shaking, causing a sudden and temporary impairment of brain function, such as a short loss of consciousness or disturbance of vision and equilibrium.
- contrecoup** - a contusion caused by the shaking of the brain back and forth within the confines of the skull.
- contusion** - distinct area of swollen brain tissue mixed with blood released from broken blood vessels.
- CSF fistula** - a tear between two of the three membranes - the dura and arachnoid membranes - that encase the brain.
- deep vein thrombosis** - formation of a blood clot deep within a vein.
- dementia pugilistica** - brain damage caused by cumulative and repetitive head trauma; common in career boxers.
- depressed skull fracture** - a fracture occurring when pieces of broken skull press into the tissues of the brain.
- diffuse axonal injury** - see shearing.
- dysarthria** - inability or difficulty articulating words due to emotional stress, brain injury, paralysis, or spasticity of the muscles needed for speech.
- dura** - a tough, fibrous membrane lining the brain; the outermost of the three membranes collectively called the meninges.
- early seizures** - seizures that occur within 1 week after a traumatic brain injury.
- epidural hematoma** - bleeding into the area between the skull and the dura.
- erosive gastritis** - inflammation and degeneration of the tissues of the stomach.
- fluent aphasia** - a condition in which patients display little meaning in their speech even though they speak in complete sentences. Also called Wernicke's or motor aphasia.
- Glasgow Coma Scale** - a clinical tool used to assess the degree of consciousness and neurological functioning - and therefore severity of brain injury - by testing motor responsiveness, verbal acuity, and eye opening.
- global aphasia** - a condition in which patients suffer severe communication disabilities as a result of extensive damage to portions of the brain responsible for language.
- hematoma** - heavy bleeding into or around the brain caused by damage to a major blood vessel in the head.
- hemorrhagic stroke** - stroke caused by bleeding out of one of the major arteries leading to the brain.
- hypermetabolism** - a condition in which the body produces too much heat energy.
- hypothyroidism** - decreased production of thyroid hormone leading to low metabolic rate, weight gain, chronic drowsiness, dry skin and hair, and/or fluid accumulation and retention in connective tissues.
- hypoxia** - decreased oxygen levels in an organ, such as the brain; less severe than anoxia.
- immediate seizures** - seizures that occur within 24 hours of a traumatic brain injury.
- intracerebral hematoma** - bleeding within the brain caused by damage to a major blood vessel.
- intracranial pressure** - buildup of pressure in the brain as a result of injury.
- ischemic stroke** - stroke caused by the formation of a clot that blocks blood flow through an artery to the brain.
- locked-in syndrome** - a condition in which a patient is aware and awake, but cannot move or communicate due to complete paralysis of the body.



**magnetic resonance imaging (MRI)** - a noninvasive diagnostic technique that uses magnetic fields to detect subtle changes in brain tissue.

**meningitis** - inflammation of the three membranes that envelop the brain and spinal cord, collectively known as the meninges; the meninges include the dura, pia mater, and arachnoid.

**motor aphasia** - see non-fluent aphasia.

**neural stem cells** - cells found only in adult neural tissue that can develop into several different cell types in the central nervous system.

**neuroexcitation** - the electrical activation of cells in the brain; neuroexcitation is part of the normal functioning of the brain or can also be the result of abnormal activity related to an injury.

**neuron** - a nerve cell that is one of the main functional cells of the brain and nervous system.

**neurotransmitters** - chemicals that transmit nerve signals from one neuron to another.

**non-fluent aphasia** - a condition in which patients have trouble recalling words and speaking in complete sentences. Also called Broca's or motor aphasia.

**oligodendrocytes** - a type of support cell in the brain that produces myelin, the fatty sheath that surrounds and insulates axons.

**penetrating head injury** - a brain injury in which an object pierces the skull and enters the brain tissue.

**penetrating skull fracture** - a brain injury in which an object pierces the skull and injures brain tissue.

**persistent vegetative state** - an ongoing state of severely impaired consciousness, in which the patient is incapable of voluntary motion.

**plasticity** - ability of the brain to adapt to deficits and injury.

**pneumocephalus** - a condition in which air or gas is trapped within the intracranial cavity.

**post-concussion syndrome (PCS)** - a complex, poorly understood problem that may cause headache after head injury; in most cases, patients cannot remember the event that caused the concussion and a variable period of time prior to the injury.

**post-traumatic amnesia (PTA)** - a state of acute confusion due to a traumatic brain injury, marked by difficulty with perception, thinking, remembering, and concentration; during this acute stage, patients often cannot form new memories.

**post-traumatic dementia** - a condition marked by mental deterioration and emotional apathy following trauma.

**post-traumatic epilepsy** - recurrent seizures occurring more than 1 week after a traumatic brain injury.

**prosodic dysfunction** - problems with speech intonation or inflection.

**pruning** - process whereby an injury destroys an important neural network in children, and another less useful neural network that would have eventually died takes over the responsibilities of the damaged network.

**seizures** - abnormal activity of nerve cells in the brain causing strange sensations, emotions, and behavior, or sometimes convulsions, muscle spasms, and loss of consciousness.

**sensory aphasia** - see fluent aphasia.

**shaken baby syndrome** - a severe form of head injury that occurs when an infant or small child is shaken forcibly enough to cause the brain to bounce against the skull; the degree of brain damage depends on the extent and duration of the shaking. Minor symptoms include irritability, lethargy, tremors, or vomiting; major symptoms include seizures, coma, stupor, or death.

**shearing (or diffuse axonal injury)** - damage to individual neurons resulting in disruption of neural networks and the breakdown of overall communication among neurons in the brain.

**stupor** - a state of impaired consciousness in which the patient is unresponsive but can be aroused briefly by a strong stimulus.

**subdural hematoma** - bleeding confined to the area between the dura and the arachnoid membranes.

**subdural hygroma** - a buildup of protein rich fluid in the area between the dura and the arachnoid membranes, usually caused by a tear in the arachnoid membrane.

**syndrome of inappropriate secretion of antidiuretic hormone (SIADH)** - a condition in which excessive secretion of antidiuretic hormone leads to a sodium deficiency in the blood and abnormally concentrated urine; symptoms include weakness, lethargy, confusion, coma, seizures, or death if left untreated.

**thrombosis or thrombus** - the formation of a blood clot at the site of an injury.

**vasospasm** - exaggerated, persistent contraction of the walls of a blood vessel.

**vegetative state** - a condition in which patients are unconscious and unaware of their surroundings, but continue to have a sleep/wake cycle and can have periods of alertness.

**ventriculostomy** - a surgical procedure that drains cerebrospinal fluid from the brain by creating an opening in one of the small cavities called ventricles.

**Wernicke's aphasia** - see fluent aphasia.

"Traumatic Brain Injury: Hope Through Research," NINDS. Publication date February 2002.

NIH Publication No. 02-2478

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Last updated December 30, 2013

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## Traumatic Brain Injury

Traumatic brain injury (TBI) is a serious public health problem in the United States. Each year, traumatic brain injuries contribute to a substantial number of deaths and cases of permanent disability. Every year, at least 1.7 million TBIs occur either as an isolated injury or along with other injuries.<sup>1</sup>

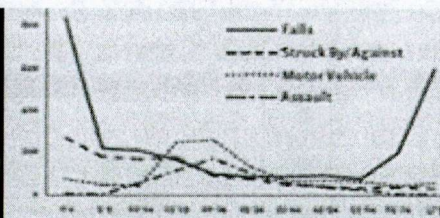
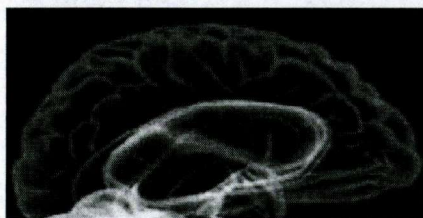
A TBI is caused by a bump, blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. Not all blows or jolts to the head result in a TBI. The severity of a TBI may range from “mild,” i.e., a brief change in mental status or consciousness to “severe,” i.e., an extended period of unconsciousness or amnesia after the injury.

CDC's research and programs work to prevent TBI and help people better recognize, respond, and recover if a TBI occurs.

### Traumatic Brain Injury Topics

- Concussion and Mild TBI (<http://www.cdc.gov/concussion/index.html>)
- Severe TBI (<http://www.cdc.gov/traumaticbraininjury/severe.html>)
- Concussion in Sports (<http://www.cdc.gov/concussion/sports/index.html>)
- Clinical Diagnosis and Management (<http://www.cdc.gov/concussion/clinician.html>)
- Statistics (<http://www.cdc.gov/traumaticbraininjury/statistics.html>)
- Long-term Outcomes (<http://www.cdc.gov/traumaticbraininjury/outcomes.html>)
- Causes and Risk Groups (<http://www.cdc.gov/traumaticbraininjury/causes.html>)
- Prevention (<http://www.cdc.gov/traumaticbraininjury/prevention.html>)
- CDC's Injury Center – Saving Lives and Protecting People: Preventing Traumatic Brain Injuries (TBI) (<http://www.cdc.gov/injury/about/focus-tbi.html>)
- Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations, and Deaths, 2002-2006. Available as [PDF 2MB] ([http://www.cdc.gov/traumaticbraininjury/pdf/blue\\_book.pdf](http://www.cdc.gov/traumaticbraininjury/pdf/blue_book.pdf)) or [Word 482K] ([http://www.cdc.gov/traumaticbraininjury/pdf/blue\\_book.docx](http://www.cdc.gov/traumaticbraininjury/pdf/blue_book.docx)).
- New Report – Surveillance for Traumatic Brain Injury–Related Deaths – United States, 1997–2007, MMWR Surveillance Summaries ([http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6005a1.htm?s\\_cid=ss6005a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/ss6005a1.htm?s_cid=ss6005a1_w))

### Research Activities



- Traumatic Brain Injuries Related to Sports and Recreation Activities Among Persons Aged ≤19 Years – United States, 2001–2009 ([http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6039a1.htm?s\\_cid=mm6039a1\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6039a1.htm?s_cid=mm6039a1_w))
- TBI Reports and Fact Sheets ([http://www.cdc.gov/traumaticbraininjury/factsheets\\_reports.html](http://www.cdc.gov/traumaticbraininjury/factsheets_reports.html))



- Research Findings on Treatment Guidelines for Severe TBI  
([http://www.cdc.gov/TraumaticBrainInjury/brain\\_trauma\\_guidelines.html](http://www.cdc.gov/TraumaticBrainInjury/brain_trauma_guidelines.html))

## Educational Initiatives and Campaigns



- Heads Up: Brain Injury in Your Practice  
([http://www.cdc.gov/concussion/HeadsUp/physicians\\_tool\\_kit.html](http://www.cdc.gov/concussion/HeadsUp/physicians_tool_kit.html))
- Heads Up: Concussion in High School Sports  
([http://www.cdc.gov/concussion/HeadsUp/high\\_school.html](http://www.cdc.gov/concussion/HeadsUp/high_school.html))
- Heads Up: Concussion in Youth Sports (<http://www.cdc.gov/concussion/HeadsUp/youth.html>)
- Heads Up: Prevent Shaken Baby Syndrome  
(<http://www.cdc.gov/concussion/HeadsUp/sbs.html>)
- Heads Up to Schools: Know Your Concussion ABCs  
(<http://www.cdc.gov/concussion/HeadsUp/schools.html>)
- Help Seniors Live Better, Longer: Prevent Brain Injury  
(<http://www.cdc.gov/traumaticbraininjury/seniors.html>)

## References

1. Faul M, Xu L, Wald MM, Coronado VG. Traumatic brain injury in the United States: emergency department visits, hospitalizations, and deaths. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2010.
2. Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control. Report to Congress on mild traumatic brain injury in the United States: steps to prevent a serious public health problem. Atlanta (GA): Centers for Disease Control and Prevention; 2003.

Page last reviewed: March 18, 2013

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Content source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control  
Centers for Disease Control and Prevention, National Center for Injury Prevention and Control

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## Advocacy & Government Affairs

The Brain Injury Association of America (BIAA) is the voice of brain injury on Capitol Hill. We tirelessly advocate for greater access to care for civilian and military populations, expanded brain injury research, adequate resources for state programs and increased congressional awareness of brain injury issues, among other priorities.

Our grassroots network is a driving force influencing law making on a national level. Please join our advocacy community to receive our weekly electronic newsletter, *Policy Corner*, and legislative action alerts.

### 2014 BIAA Legislative Agenda/Issue Briefs

BIAA encourages all advocates to use these issue briefs when working with national, state and local government officials on critical public policy issues for people with brain injury, including: [access to care](#), [research](#), [TBI Act appropriations and reauthorization](#), and membership in the [Congressional Brain Injury Task Force](#).

### BIAA Federal and State Public Policy Platform

Click [here](#) to download BIAA's public policy platform.

**Latest Policy Corner News - February 21, 2014** To sign up to receive BIAA's *Policy Corner* weekly E - Newsletter, click [here](#) !

### TBI Act Reauthorization

TBI Act Reauthorization, H.R. 1098 was voted out of the House Committee on Energy and Commerce on December 11, 2013 in an open markup. The TBI Act will be considered by the full House of Representatives in early 2014. Thank you to BIAA's grassroots for educating your Representatives about the importance of reauthorizing the TBI Act and moving it through the House! BIAA and the TBI Act stakeholders continue to work with the United States Senate to introduce a companion bill to H.R. 1098 early next year. Please thank House Committee on Energy and Commerce members for supporting the TBI Act. Also, call your Member of Congress and ask him or her to co-sponsor H.R. 1098 today!

### Brain Injury Awareness Day 2014

Brain Injury Awareness Day on Capitol Hill is Wednesday, March 12, 2014. BIAA is committed to helping the Congressional Brain Injury Task Force plan a successful event. BIAA thanks Reps. Bill Pascrell (D-NJ) and Tom Rooney (R-FL), co chairs of the Congressional Brain Injury Task Force, for their leadership. As in years past, several events will be hosted throughout the day. A schedule of events is as follows:

10:00 AM – 2:00 PM Brain Injury Awareness Fair, First Floor Foyer of the Rayburn House Office Building

2:30 PM – 4:00 PM Briefing: "Returning to Work: Making Headway After Brain Injury", U.S. Capitol Visitor Center Meeting Room South

5:00 PM – 7:00 PM Reception Celebrating Brain Injury Awareness Month, The Gold Room 2168, Rayburn House Office Building

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**2014 Advocacy Message**

As the second session of the 113th Congress begins, the Brain Injury Association of America looks forward to the next year with enthusiasm for our legislative priorities. Even though Congress will face midterm elections this year, BIAA is hopeful for TBI Act reauthorization in 2014!

With the budget accord reached before the winter holiday recess by House Budget Chairman Paul Ryan and Senate Budget Chairwoman Patty Murray, appropriators can now finish work on a fiscal 2014 omnibus spending bill before funding runs out on January 15. The budget accord established overall discretionary spending levels for both fiscal 2014 and fiscal 2015 that will make it easier for lawmakers to move some of the 12 fiscal 2015 appropriations bills that it has been handled by Continuing Resolution in recent years. BIAA will continue to monitor appropriations and advocate for funding of TBI programs in the President's Fiscal Year 2015 budget. Appropriations increases in 2014 are unlikely with the current political environment, but BIAA still has opportunity to elevate our cause in Congress.

As in 2013, BIAA looks forward to collaborating on our policy agenda in 2014. Our champions on Capitol Hill, Reps. Bill Pascrell, Jr. (D-NJ) and Tom Rooney (R-FL) will lead our efforts to reauthorize the TBI Act and will host Brain Injury Awareness Day with the members of the Congressional Brain Injury Task Force on March 12, 2014. The TBI Act, H.R. 1098, was voted out of the House Committee on Energy and Commerce at the end of 2013 and BIAA looks forward to floor debate in the full House of Representatives early this year. The Congressional Brain Injury Task Force will assist BIAA in promoting our other policy goals that include increasing access to high quality care and maintaining vital brain injury research.

BIAA will also be monitoring the implementation of the Patient Protection and Affordable Care Act to ensure individuals are not denied brain injury services which would be a violation of the ACA. BIAA will collect quantitative and qualitative data throughout 2014 and report the information to the Secretary of Health and Human Services.

BIAA will also continue to monitor and comment on the Department of Defense and the Department of Veterans Affairs' research and treatment for active duty military, their dependents, and Veterans in 2014.

BIAA will collaborate with our federal agency partners in 2014, including Health Resources and Services Administration, the National Institute on Disability and Rehabilitation Research, the Centers for Disease Control and Prevention, the National Institutes of Health, the Food and Drug Administration, the Administration for Community Living, and the Office of Special Education and Rehabilitative Services in the Department of Education, and continue to participate in the many health and disability coalitions whose members share our goals.

BIAA appreciates all the efforts and involvement of our grassroots in the legislative process. Thank you! In 2013 you witnessed your hard work in action as the TBI Act, H.R. 1098 moved successfully out of committee in the House of Representatives. BIAA will continue to count on its grassroots advocates to show members of Congress how important brain injury is to their constituents in 2014. You have all truly made a difference and we hope to continue that excitement and dedication in 2014! Happy New Year and best wishes in 2014!

**BRAIN INJURY ASSOCIATION OF AMERICA**

1608 Spring Hill Road, Suite 110 • Vienna, VA 22182 • Phone: 703-761-0750 • Fax: 703-761-0755

**National Brain Injury Information Center (Brain Injury Information Only) 1-800-444-6443**





CONGRESSMAN  
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*Representing the 9th District of New Jersey*

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## Brain Injury Task Force





Approximately 1.4 million Americans experience Traumatic Brain Injury (TBI) each year and an estimated 3.2 million Americans are living with long-term, severe disabilities as a result of brain injury. Another 360,000 men and women are estimated to have been inflicted by a TBI in the conflicts in Iraq and Afghanistan. The national cost of TBI is estimated to be \$60 billion annually. That is why I founded the Congressional Brain Injury Task Force in 2001. Co-Chaired by Rep. Thomas J. Rooney of Florida, the task force will

serve as a clearinghouse of information for Congress and the public. It will promote full funding for the TBI Act and other brain injury research programs, and provide guidance to federal agencies on policies and proposed rulemakings.

## **More on Brain Injury Task Force**

### **Rep. Pascrell Introduces Legislation Requiring Stronger Standards For Youth Football Helmets**

May 22, 2013

WASHINGTON – U.S. Representative Bill Pascrell, Jr. (D-NJ-09), co-founder and co-chair of the Congressional Brain Injury Task Force, was joined by Rep. Tom Rooney (R-FL) today in introducing bipartisan legislation aimed at protecting youth athletes from the dangers of sports-related traumatic brain injuries. The Youth Sports Concussion Act of 2013 would ensure that new and reconditioned football helmets for high school and younger players meet safety standards that address concussion risk and the needs of youth athletes.

### **Rep. Pascrell Announces Initiative To Protect Young Athletes From TBI**

Sep 27, 2012

CLIFTON — U.S. Rep. Bill Pascrell, Jr. (D-NJ-08), founder and co-chairman of the Congressional Brain Injury Task Force, today joined Dr.

### **Rep. Pascrell Joins NFL Commissioner and U.S. Army to Announce Traumatic Brain Injury Initiative**

Sep 13, 2012

WASHINGTON - U.S. Rep. Bill Pascrell, Jr. (D-NJ-08) a member of the Health Subcommittee of the House Ways and Means Committee, joined NFL Commissioner Roger Goodell and Army Vice Chief of Staff General Lloyd



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Washington, District Of Columbia - Legislative Aide at U.S. Senator John D. Rockefeller IV

View **Alyssa Penna's** professional profile on LinkedIn. LinkedIn is the ... Collaborate with other **Congressional** staff and stakeholders to carry out legislative goals ...

### Alyssa L. Penna - Congressional Staffer Salary Data - LegiStorm

[www.legistorm.com/person/Alyssa\\_L\\_Penna/174689.html](http://www.legistorm.com/person/Alyssa_L_Penna/174689.html)

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### Alyssa L. Penna - Biography from LegiStorm

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LegiStorm's bio information on **Alyssa L. Penna** including contact information, **congressional** salary, employment history, education and more.

### Rep. Bill Pascrell (D-New Jersey) Staff - Get Engage{d}, Congress.org

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Staff Members: Chief of Staff: Ben Rich Scheduler: Kyle Coleman Legis. Dir.: Arthur Mandel Comm. Dir.: Thomas Pietrykoski Veteran Affairs LA: **Alyssa Penna**

### Alyssa Penna (U.S. Senator John D. Rockefeller IV) - newsle

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### [PDF] Congressional Housing Staffers - Monarch Housing Associates

[www.monarchhousing.org/wp.../CongressionalHousingStaffers.pdf](http://www.monarchhousing.org/wp.../CongressionalHousingStaffers.pdf)

New Jersey's **Congressional** Delegation and Housing Staff. Washington Offices. U.S. Senate ... Housing Staff: **Alyssa Penna** [alyssa.penna@mail.house.gov](mailto:alyssa.penna@mail.house.gov)

### FCNL: Online Action Center - Rep. Bill Pascrell Jr. (D-New Jersey ...

<https://fconl.capwiz.com/fconl/bio/id/389&congress=1131&lvi=C>

... LA: **Alyssa Penna**; Health LA: **Alyssa Penna**; Foreign Policy LA: Ian McTiernan ... F, **Congressional** Progressive Caucus "Back to Work" Budget, 03/20/2013 ...

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### Congresswoman Allyson Schwartz | Representing the 13th ...

[schwartz.house.gov/](http://schwartz.house.gov/)

... on Bipartisan, Bicameral SGR Repeal Proposal. Feb 6, 2014 Press Release. Washington, D.C. - U.S. Rep. Allyson Y. Schwartz (PA-13), a member of the

### Bill Pascrell - MEMBER - Data | Washington Examiner

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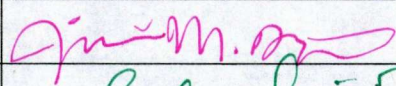
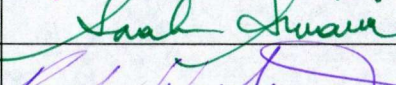
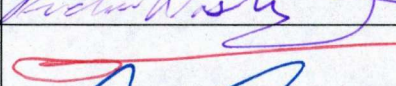
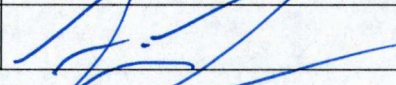
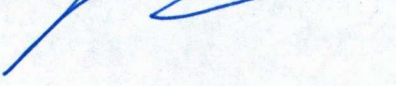
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# PINK FOLDER CHECKLIST: MESSAGES

|                       |                                              |
|-----------------------|----------------------------------------------|
| <b>Document Name</b>  | 2014 Capitol Hill Brain Injury Awareness Day |
| <b>Writer</b>         | S. Sullivan                                  |
| <b>Signature Type</b> | POTUS AP                                     |

| Production                                                                          | Writer                                                                              | Assistant Director                                                                  | Deputy Director                                                                     | N/A |                    |                                                                                                                             |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |     |                    | <input type="checkbox"/> Mail Directly <input checked="" type="checkbox"/> Send via Interoffice mail<br>Office/Room: EW 107 |
|    |    |    |    |     | <b>Style</b>       | Is letter <b>spacing</b> and <b>indentation</b> correct? Is the <b>date</b> correct?                                        |
|    |    |    |    |     |                    | Are <b>curly apostrophes</b> and <b>Oxford commas</b> used throughout?                                                      |
|    |    |    |    |     | <b>Names</b>       | Is the <b>name of the honoree/organization</b> spelled correctly in all mentions?                                           |
|    |    |    |    |     |                    | Are there any <b>prefixes/suffixes</b> on names? Are they all correct?                                                      |
|    |    |    |    |     | <b>Messages</b>    | Did we reference the <b>type</b> of event correctly? (dinner/gala/etc.)                                                     |
|    |    |    |    |     |                    | Is the event <b>name</b> correct? (including numbers for anniversaries)                                                     |
|   |   |   |   |     |                    | Is Fiona's letter outlining the <b>Message's terms of use</b> included, and is the correct use listed?                      |
|  |  |  |  |     |                    | Is the organization's POC name and address spelled correctly?                                                               |
|  |  |  |  |     |                    | Is there <b>no address block, salutation, or sincerely</b> ?                                                                |
|  |  |  |  |     | <b>Final Check</b> | Are the appropriate <b>supporting materials</b> included in the folder? (Citations, requests, address verifications, etc.)  |
|  |  |  |  |     |                    | Did you read the correspondence <b>aloud</b> to yourself?                                                                   |
|  |  |  |  |     |                    | Have all questions and comments raised during review been addressed?                                                        |
|  |  |  |  |     |                    | If a <b>photo</b> was requested, is it in the envelope?                                                                     |
|                                                                                     | Production Only - After Final Circulation                                           |                                                                                     |                                                                                     |     | <b>SharePoint</b>  | Were any <b>edits</b> made to the final <b>SharePoint Word document</b> before it was archived?                             |

|                           | Signature                                                                           | Date    | Time    |
|---------------------------|-------------------------------------------------------------------------------------|---------|---------|
| <b>Production</b>         |  | 2/26/14 | 3:20 pm |
| <b>Writer</b>             |  | 2/26/14 | 4:18 pm |
| <b>Assistant Director</b> |  | 2/26/14 | 5:04 pm |
| <b>Deputy Director</b>    |  | 2/26    | 5:38    |
| <b>Director</b>           |  | 2/26    | 5:45    |