

SUMMARY



If my son Owen was sitting with us today he would say, *"Mom, it's OK. Don't make a fuss."* He would cringe at the thought of being the center of so much attention. Although an excellent wordsmith, Owen would adhere to the unspoken football rule that words are used sparingly. Actions speak for themselves. In that ancient motif of oratory Athens verses warrior Sparta – today Owen would stand with Sparta.

In as much as I speak, I speak only for myself. Nor do I speak as an expert or authority on football, a sport about which I learned only when I came to the United States in 1982. Nevertheless, I have thought deeply about the cultural role that football plays in the United States and I hope my comments are illuminating.

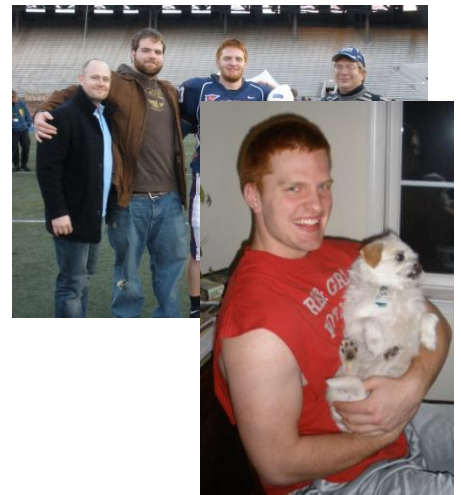
My Personal Story

My first purpose is to put a human face on the disease called Chronic Traumatic Encephalopathy (CTE). On April 26th 2010 my son Owen Thomas, aged 21, a football player at the University of Pennsylvania in the Wharton School of Business, committed suicide on a dreary rainy Monday afternoon. He hung himself in his room in the house he shared with four other football team mates. Family and friends were deeply shocked as Owen seemed the most unlikely person to commit suicide. Subsequent detailed analysis of Owen's brain tissue revealed that he had the onset of CTE in the frontal part of his brain.

Owen's untimely death generates a new set of questions to be addressed by future CTE research. He had no known concussions at any time when playing soccer, basketball, baseball or football. To our knowledge Owen never used steroids or abused drugs or alcohol. He had never been involved in a car accident and had never been hospitalized. He had no history of depression. We have no family history of depression or dementia. Owen never complained of headaches or acted strangely.

The only possible explanation we can see for the presence of CTE is that Owen started to play football at the age of 9. He was a very physical and intense player who threw himself into every sport he played. In precollege football he often played offense and defense and was on the field for much of the game. Maybe he had mild concussions that he never reported – that would be Owen anxious to return to the game, not a coach pressurizing him. No one could ever pressurize Owen to do anything. Or maybe CTE is the cumulative effect of multiple subconcussions, compounded by some as yet unknown genetic component.

Whatever the explanation, the fact is that we now know



Owen – the recipient of his High School’s Eisenhower Award for leadership – faced an increasingly circumscribed future as his brain disease progressed. We would surely have loved and supported him no matter what the cost, but the bright future to which he aspired would have eluded him.

The Complexity of the Problem

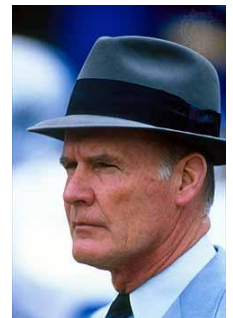
Since learning that Owen suffered from CTE I have become more aware of the many facets of this problem and the immense human sorrow that lies behind the loss of young lives. For example, in the bitterness of grief it is hard not to be angry that the Philadelphia Medical Examiner did not preserve Owen’s brain as a complete entity or ask me if I wanted it kept separate in case it was needed for research. The brain was simply thrown in a bag with all the other parts. Another example: I received an e-mail from a woman telling me her husband was discharged following a snow board related concussion. He had had several sports related concussions previously. No discharge information was given to alert the family to watch for mood changes. Her husband committed suicide. Clearly changes are needed in the medical community as well as the sports community. Another facet: if CTE is found in only 1% of youth participating in protracted youth contact sports – that 1% will produce a crushing public health cost for long term skilled nursing care if this reaches a debilitating stage when the person is only in their 50’s.

In face of the complexity of this issue, and its potentially widespread nature, Congress is uniquely placed to use its position to promote serious discussion of this public health concern. Lawmakers will surely want to protect their cash strapped school districts from threats of lawsuits, and coaches and parents surely want information of how to protect their young players.



The Social Implications of the Problem

It has given me great joy to learn about the character of America through watching professional, college, high school and suburban youth football. What other capital city has a sport where beefy male fans, dress as pigs, dressed as women? NFL and college football unite fans across economic boundaries and age groups. In a



struggling economy football gives people something to cheer for, a pride and a hope.

Few characters are as demonstrative as former Steelers coach Bill Cowher. It is much more common to see the silent stoicism of the late Cowboys coach Tom Landry. Nevertheless, behind the silent façade lie deep passionate complex feelings. Football is indeed the spirit of Sparta acted out in our own time, a careful crafting of male athletic skill and team work. Football provides inspiration and hope to many including young African American players. High School football can be an avenue to college football and a college education.

In speaking out about Owen’s brain disease it is my hope that parents and coaches will unite to improve the safety of younger players, so football can continue to be a powerful and exciting sport that unites families and communities all across the United States.

BACKGROUND INFORMATION FOR OWEN THOMAS

- Third generation college football player
- Two older brothers played football
- Excellent athlete
- Excellent scholar
- Well liked by friends
- Fan of Philadelphia Eagles

OWEN'S PERSONALITY

Owen had thick straight flaming red hair of which he was very proud. When it was long he liked to finish a football play and as he walked to the side lines he would take his helmet off and shake his long red hair as if he were a Viking.

As soon as he was born Owen was a dynamic “presence”, a confident type-A personality. He was energetic and funny with a great capacity to imitate people. He was a born actor. He loved his older brothers Matt and Morgan. Owen was fearless.

One time when he was 2 years old he was dancing on a picnic table in a local park. He had covered his face and body in some charcoal ashes he had found and he was dancing and singing like an Aborigine. We were clapping and laughing at him, then he danced right off the end of the table! Luckily my husband reached out his strong right hand and caught him as if he were a football arriving in the end zone.

One summer when he was 4 we arrived at a motel on the Eastern Shore of Maryland. Owen was hot from a long trip so he got out of the car and ran and jumped in the deep end of the hotel swimming pool. I had to jump in fully clothed straight after him and grab him before he drowned!

Owen was deeply kind. Parents of bullied kids would ask him to sit next to their child on the bus, or give protection in the playground. That was the end of bullying.

He was well organized and planned ahead. He always brought me his school papers to sign, with a pen, days before they were needed. Every school year he color coded his files, got index tabs, stocked up on erasers and pencil leads and got “organized”.

Owen was strong. On church mission trips he did twice the work that everyone else did, but came home starving because he didn't get enough food to eat. He drank gallons of milk and would stop at Wendy's to get 4 double hamburgers with French fries. He would have food “crazes”. One time it was Sweet Lebanon Bologna. Another time it was eggs. Or it was pomegranate juice. As long as there was lots of food around, Owen was happy.

Owen was the funniest, most dynamic person you could ever want to meet. If he had not developed CTE he would have grown up to be a wonderful contributing citizen.

Additional Data

- **Background**

- Owen Thomas committed suicide at the age of 21, at the end of his Junior year at the University of Pennsylvania. He had been playing football since he was 9 years old and was recently chosen to be a co-captain of the Penn football team. Owen had no known or reported concussions.
- His parents donated Owen's brain tissue to the BU Center for the Study of Traumatic Encephalopathy where it was examined by Dr. McKee.
- The examination revealed that Owen had mild but definite chronic traumatic encephalopathy (CTE), a progressive brain disease caused by repetitive brain trauma. Upon learning these findings, Owen's parents requested to make this information public.
- **Teaching Points**
 - CTE can develop even when an individual has no reported history of concussion.
 - Whether Owen had undiagnosed concussions is unknown. Incidence data indicates it is likely that he did
 - Perhaps subconcussive blows to the head alone, such as those commonly experienced by football linemen and linebackers around 1000 times a year, can lead to this progressive brain disease.
 - If a reporter mentions this is like the WVU Chris Henry case, where they claimed he had no concussions, mention that Henry's mother said Henry had concussions in high school, so it's not the same (but WVU apparently didn't ask her)
 - This further demonstrates that CTE can begin quite early in life (along with the 18 year-old case from 2009), though it is unclear if this mild stage of CTE results in the same symptoms seen in older individuals with more advanced disease.
 - These symptoms include memory and cognitive impairment, depression, and problems with impulse control; CTE eventually leads to full-blown dementia.
 - We cannot make any direct link between Owen's CTE and his suicide. Suicide is a very complex issue and far too common in teenage boys and young men.
 - We do not know how common CTE is in young athletes.
- **Moving Forward**
 - Owen's case is additional evidence that we urgently need more research on CTE to fully understand the severity and frequency of brain trauma that can trigger this neurodegenerative disease – especially so we can make changes to sports to prevent it.
 - Although more research is needed to understand this disease and who is at risk, it is not too early to implement changes to the way youth sports are played and practiced.
 - Owen's parents hope their tragedy will promote education among coaches, parents and players.
 - Owen's parents are not placing blame but they do hope Ivy League coaches and teams will step forward as leaders in changing the game to make it safe for players.
 - The BU CSTE conducts this research to learn the following:
 - The cause of CTE
 - Why some people get this disease and others do not.
 - A way to diagnose CTE in living persons
 - Treatment for CTE
 - A cure for CTE
 - How to prevent CTE in current and future athletes
- **The Story of the Sports Legacy Institute**
 - SLI was founded on June 14, 2007 in Boston, Massachusetts by Christopher Nowinski and Dr. Robert Cantu in reaction to new medical research indicating brain trauma in sports had become a public health crisis. Post-mortem analysis of the

brain tissue of former contact sports athletes was revealing that repetitive brain injuries, both concussions and non-concussive blows, could lead to a neurodegenerative disease known as Chronic Traumatic Encephalopathy. In addition, an absence of awareness and education on concussions, specifically proper diagnosis and management, was allowing the disease to proliferate. Finally, with brain trauma becoming the signature injury of the wars in Iraq and Afghanistan, this research/education model could also be applied to the military.

- SLI was founded to solve this concussion crisis in sports and the military through medical research, treatment, and education & prevention. The initial vision of SLI was to formalize the groundbreaking neuropathological research and develop treatment and a cure through partnering with a top-tier university medical school. That vision was achieved when SLI partnered with Boston University School of Medicine in September, 2008, to form the Center for the Study of Traumatic Encephalopathy. SLI would also develop ways to raise awareness of the issue and directly educate coaches, athletes and parents. As of 2009, SLI has achieved those goals through our Coaches Concussion Clinic program and raising awareness through media like the New York Times, 60 Minutes, CNN, ESPN, and many others.
- **Mission Statement**
- The mission of the Sports Legacy Institute is to advance the study, treatment and prevention of the effects of brain trauma in athletes and other at-risk groups.
-

SLI CONTACT DATA

Ann C. McKee, MD
Associate Professor of Neurology and Pathology
Co-Director Center for the Study of Traumatic Encephalopathy
Boston University School of Medicine
Director, VISN-1 Neuropathology, New England Veterans Administration
Medical Centers
Director, Brain Banks of the Center for the Study of Traumatic
Encephalopathy, Alzheimer's Disease Center, Framingham Heart Study,
and the Centenarian Study, Boston University School of Medicine
Tel: (781) 687-2913
Email: amckee@bu.edu

Christopher Nowinski
Co-Director, Center for the Study of Traumatic Encephalopathy
Boston University School of Medicine
President and CEO, Sports Legacy Institute
Tel: (617) 216-9512
Email: Nowinski@bu.edu

Sports Legacy Institute's Minimum Recommended Guidelines for Brain Protection in Youth Sports

Why Establish Guidelines?

Medical research has exposed a brain trauma crisis in contact sports. In sports like football, soccer, and ice hockey, studies show that every season around 50% of athletes experience concussive symptoms after a hit to the head. Unfortunately, only a small percentage of these are reported and diagnosed. Additionally, many diagnosed concussions are not treated properly. These undiagnosed and poorly managed concussions put young athletes at risk of Second-Impact Syndrome, which can cause permanent injury or even death. Finally, the evidence is now clear that repetitive brain trauma suffered in youth sports causes some athletes to develop the progressive neurodegenerative brain disease Chronic Traumatic Encephalopathy (CTE), which eventually leads to dementia.

SLI's Minimum Recommended Guidelines

1. Preseason Education for Coaches
2. Preseason Education for Athletes
3. Preseason Education for Parents
4. Coaches Use CDC's Heads Up Clipboard Sticker
5. Adopt CDC's Concussion Action Plan for Removal and Return-to-Play
6. Prevention through Neck Strengthening
7. Prevention through Overall Brain Trauma Reduction

While sports provide immense value both to athletes and our society in general, with current practices they are exposing children to unacceptable levels of brain damage. Much of this brain damage, however, is preventable with a few simple steps.

For the first time, the Sports Legacy Institute is issuing Minimum Recommended Guidelines for Brain Protection in Youth Sports, also known as "SLI Guidelines." The list, developed by Dr. Robert Cantu and Christopher Nowinski, incorporating the input of multiple SLI Advisory Boards, comprises consensus best practices as well as progressive ideas. To be included, each guideline is required to be **simple** and **free** so that they can be adopted by any organized youth sports program. SLI hopes that programs choose to exceed these minimum guidelines.

We ask that sports programs voluntarily adopt SLI's Minimum Recommended Guidelines for Brain Protection in Youth Sports.

#1 - Educational Guidelines for Coaches

A program should require preseason concussion and brain trauma education for coaches, athletes, and parents. Coaches should be required to pass the CDC's certification program.



Recommended Program

CDC's "Heads Up" Online Training Course

Other Recommended Programs

1. NFHS Online Training Course
2. USA Football for Youth Coaches Video
3. ACTive – Athletic Concussion Training for Coaches
4. Brain Injury Association of MA – Play Smart

Additional Resources

CDC Heads Up Program including:

- Fact sheets
- Posters
- Action plans

Print out or order for free

#2 - Educational Guidelines for Athletes

A program should require preseason concussion and brain trauma education for coaches, athletes, and parents.



Recommended Program

Distribute CDC Fact Sheet for Athletes to facilitate discussion of concussive symptoms and why athletes should report them.

- CDC Fact Sheet for High School Athletes
- CDC Fact Sheet for Youth Athletes

Print out or order for free

Additional Recommended Resources

1. HeadStrongPlayer.org
2. CDC – Brandon’s Story
3. Brain Injury Association of MA – Play Smart
4. **CDC Heads Up** Program including:

- Magnet
- Quiz

#3 - Educational Guidelines for Parents

A program should require preseason concussion and brain trauma education for coaches, athletes, and parents.



Recommended Program

Distribute CDC Fact Sheet for Parents:

- Of High School Athletes
- Of Youth Athletes

Other Recommended Resources:

1. Brain Injury Association of MA – Play Smart
2. NFHS Online Training Course
3. **CDC Heads Up** Program including:

- Magnet
- Quiz

#4 - Clipboard Sticker for Coaches

Coaches should be required to have the CDC *Heads Up* Stickers on their clipboards for easier access to both a list of common concussive signs and symptoms and an action plan if an athlete potentially experiences a concussion.



Recommended Program

Use CDC Heads Up Clipboard Stickers

- For High School Coaches
- For Youth Coaches

Print out or order for free

Other Recommended Resources

CDC Heads Up Program including:

- Magnet
- Poster

#5 - CDC Concussion Action Plan

Programs should adopt the CDC *Heads Up* Concussion Action Plan.

ACTION PLAN

If you suspect that a player has a concussion, you should take the following steps:

1. Remove athlete from play.
2. Ensure athlete is evaluated by an appropriate health care professional. Do not try to judge the seriousness of the injury yourself.
3. Inform athlete's parents or guardians about the known or possible concussion and give them the fact sheet on concussion.
4. Allow athlete to return to play **only** with permission from an appropriate health care professional.

It's better to miss one game than the whole season.

For more information and to order additional materials **free-of-charge**, visit:

www.cdc.gov/ConcussionInYouthSports

#6 - Prevention through Neck Strengthening

Studies* have revealed that neck strength may be an important factor in reducing the forces on the brain resulting from impacts to the head.



Recommended Program

There is no officially recommended training program for neck strengthening. Please work with a local certified strength and conditioning coach to develop a plan for your team.

* Tierney, R.T., Sitler, M.R., Swanik, B.C., Swank, K.A., Higgins, M., & Torg, J. (2004). Gender differences in head-neck segment dynamic stabilization during head acceleration. *Medicine & Science in Sports & Exercise*, 37, 272-279.

#7 - Total Brain Trauma Reduction

Coaches should monitor total brain trauma and strive to **reduce** both the **number of hits** to the head that players receive and the **severity**. Research on Chronic Traumatic Encephalopathy from Boston University's Center for the Study of Traumatic Encephalopathy indicates that risk of CTE may be more correlated to **total lifetime brain trauma** than concussions.



Recommended Program

In 2010, there is no formal program available. SLI asks that coaches attempt to monitor brain trauma, and significantly reduce it going forward. SLI hopes to develop guidelines for brain trauma, starting with football, much like Little League Baseball has developed extensive guidelines for "Pitch Counts" to protect the elbows of children.