

VA



U.S. Department
of Veterans Affairs

Focus on Health Equity and Action:

National Expert Panel Discussion on TBI & Chronic Traumatic Encephalopathy Morbidity & Mortality among Vulnerable Veterans

Bennet I. Omalu, MD, MBA, MPH, CPE

David X. Cifu, MD

Leonard E. Egede, MD, MS

Uchenna S. Uchendu, MD



June 30, 2016 @ 3PM EST



Veterans Health Administration
Office of Health Equity



WHAT YOU CAN EXPECT

- **Introductions & Acknowledgement**
- **Background – Health Equity Action Plan**
- **Opening comments by expert panelists**
- **Moderator Questions**
- **Audience Questions**
- **Discussant Comments**
- **Moderator Wrap up**





ACKNOWLEDGEMENT

- **Veterans - focus of this dialogue and the foundation/reason for VA existence**
- **Distinguished Panelists and Discussant**
- **OHE staff - Kenneth T. Jones, PhD**
- **OHE detail - Clara 'Libby' Dismuke, PhD**
- **HSR&D - CIDER**
- **Participants - record registration numbers!**





IN THE NEWS...

MilitaryTimes

HOME WASHINGTON ELECTION 2016 BEST FOR VETS BENEFITS CENTER FAMILY OFFDUTY

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VA secretary pledges to donate his brain to research

Patricia Kimm, Military Times 5:07 p.m. EDT April 20, 2016

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Athlete, West Point cadet, Army Ranger, Proctor & Gamble CEO, VA secretary.

Brain donor.

VA Secretary Bob McDonald said on Wednesday he will donate his brain for research on the long-term health effects of concussions, including diseases like chronic traumatic encephalopathy, a brain wasting condition that has been diagnosed after death in National Football League athletes and some veterans.

Speaking at a VA Brain Trust summit in Washington, D.C., McDonald said his brain, which has been knocked around since childhood when he played football, as a young adult playing rugby and boxing at the U.S. Military Academy in New York, and as an Army paratrooper jumping out of airplanes, may not be much help to research but could at least contribute to the understanding of lifespan of an active brain.

"I'm willing to pledge my brain to the [Veterans Affairs-Boston University-Concussion Legacy Foundation] collaboration because this is very, very serious," McDonald said.

MILITARYTIMES

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UFC veteran Tom Lawlor taking time off for CTE-related symptoms

By Frank Schrab May 24, 2016 8:14 PM Shutdown Corner

UFC veteran Tom Lawlor taking time off for CTE-related symptoms

By Frank Schrab May 24, 2016 8:14 PM Shutdown Corner



As the NFL deals with yet another concussion controversy, another former great was diagnosed with chronic traumatic encephalopathy, the degenerative brain disease that has been linked to head trauma playing football.

Bubba Smith, the late NFL star and actor, had CTE

Bubba Smith, the great Baltimore Colts, Oakland Raiders and Houston Oilers defensive end who reached a whole new audience as a star in the "Police Academy" movies and other acting roles, had CTE, *The New York Times* reported.

Smith played nine NFL seasons, and before that he was a college star at Michigan State. Smith died in 2011.

There are still many questions about the link between concussions suffered while playing football and CTE, but Smith is the 90th former NFL player examined by the Boston University brain bank. He has been diagnosed with CTE. *The New York Times* said. The brain bank has examined 94 brains.

FEDERAL HEALTH MATTERS

VA to Reexamine 24,000 Veterans for TBI

June 2, 2016

Conflicting and confusing guidance documents may have led to missed cases of traumatic brain injuries.

More than 24,000 veterans who received examinations but were not diagnosed with traumatic brain injuries (TBIs) will be eligible for new medical examinations, the VA has announced. Due to confusing guidance documents, the original examinations were not conducted by a psychiatrist, physiatrist, neurosurgeon, or neurologist as mandated by VA policy. The 24,000 veterans may be eligible for additional benefits and service-connected compensation based on the results of the new examinations.

Chronic traumatic encephalopathy in an Iraqi war veteran with posttraumatic stress disorder who committed suicide

BENNET OMALU, M.D., M.B.A., M.P.H., C.P.E.,^{1,2} JENNIFER L. HAMMERS, D.O.,^{1,3} JULIAN BAILES, M.D.,^{1,4} RONALD L. HAMILTON, M.D.,⁵ M. IYAS KAMBOB, PH.D.,⁶ GARRETT WEBSTER,^{1,2} AND ROBERT P. FITZSIMMONS, J.D.^{1,2}

¹Brain Injury Research Institute, Morgantown, West Virginia; ²Department of Pathology, University of California, Davis, California; ³Office of the Chief Medical Examiner, Boston, Massachusetts; ⁴Department of Neurology, West Virginia University, Morgantown, West Virginia; ⁵Department of Pathology, University of Pittsburgh, Pennsylvania; ⁶Department of Human Genetics, University of Pittsburgh, Pennsylvania; and ⁷Fitzsimmons Law Offices, Wheeling, West Virginia

Following his discovery of chronic traumatic encephalopathy (CTE) in football players in 2002, Dr. Bennet

Buzzing News on Yahoo Sports: Internet's roast of Stephen Curry's new shoes is relentless

By Frank Schrab May 24, 2016 8:14 PM Shutdown Corner

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Following his discovery of chronic traumatic encephalopathy (CTE) in football players in 2002, Dr. Bennet

Top Headlines

- LIVE: Updates on Muhammad Ali funeral
- Mr. Hockey/ Gordie Howe dies at age 80
- LIVE: Hockey world remembers Gordie Howe
- Rays sideline reporter axed for racist comments
- Jim Brown asks grunts to address violence issue
- Internet roast of Curry's new shoes relentless
- Plächer Machs released by Cubs, then arrested
- Will Kerr turn to Death Lineup in Game 4?
- Phillies draft CF Mackey Moniak at No. 1 overall
- 2016 Fantasy Football is open. Sign up now



Homeowners Who Have Not Missed A Payment in 3 Years Are In For A Big Surprise

What to read next



...gathered in San Francisco to create brain health innovations for Veterans experiencing mild traumatic brain injury and post-traumatic stress disorder...

VA Brain Trust Hackathon Serving Veterans

BoozAllenHamilton

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SUGGESTED READING

- Cifu DX, Taylor BC, Carne WF, Bidelspach D, Sayer NA, Scholten J, Campbell EH. (2013). TBI, PTSD and pain diagnoses in Iraq and Afghanistan conflict Veterans. *J Rehabil Res Develop*, 50(9): 1169-1176.
- Defense and Veterans Brain Injury Center. DoD TBI Worldwide Numbers since 2000. http://dvbic.dcoe.mil/sites/default/files/DoD-TBI-Worldwide-Totals_2000-2015_Q1-Q4_March-30-2016_v1.0_2016-04-14.pdf. Updated April 4, 2016.
- Dismuke CE, Gebregziabher M, Yeager D, Egede LE. (2015). Racial/ethnic differences in combat- and non-combat-associated traumatic brain injury severity in the Veterans Health Administration: 2004-2010. *Am J Public Health*, 105(8): 1696-1702.
- Omalu BI, Bailes J, Hammers JL, Fitzsimmons RP. (2010). Chronic traumatic encephalopathy, suicides and parasuicides in professional American athletes: the role of the forensic pathologist. *Am J Forensic Med Pathol*, 31(2): 130-132.
- Uchendu US, Omalu BI, Cifu, DX, Egede, LE. (2016). Repeated concussions: Time to spur action among vulnerable Veterans. *Am J Public Health*, 106(8): e1-e2.
- Supplemental Materials @ www.va.gov/healthequity





EXPERT PANELISTS



**Bennet I. Omalu, MD, MBA, MPH, CPE,
Associate Clinical Professor of Pathology,
University of California, Davis**
<http://www.bennetomalu.com/>



David X. Cifu, MD
**National director of the VA's Physical
Medicine & Rehabilitation Services**
<https://cenc.rti.org>



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DISCUSSANT AND MODERATOR

Leonard E. Egede, MD, MS

**Director, VA HSR&D Health Equity & Rural
Outreach Innovation Center, Charleston, SC.**



<http://clinicaldepartments.musc.edu/medicine/divisions/gimg/faculty/egede.htm>



Uchenna S. Uchendu, MD

**Chief Officer, Office of Health Equity
VA Central Office, Washington DC.**

<http://www.va.gov/HEALTHEQUITY>



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OHE PROGRAM OFFICE SCOPE

- **Role of Program**

- OHE champions the advancement of health equity and reduction of health disparities through 5 key focal areas*:

1. Leadership
2. Awareness
3. Health System and Life Experience
4. Diversity and Cultural Competency of the Workforce
5. Data, Research, and Evaluation

- **Strategic Alignments**

- VHA Strategic Plan Objective 1(e)—*Quality & Equity: Veterans will receive timely, high quality, personalized, safe, effective and equitable health care, irrespective of geography, gender, race, age, culture or sexual orientation*
- Blueprint for Excellence strategies 2.2a, 3.2a and 7.2b

*VHA Health Equity Action Plan



THANK YOU VETERANS!



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DEPARTMENT OF VETERANS AFFAIRS



myVA
Putting Veterans First



- Veteran/Customer Experience
- Employee Experience
- Support Service Excellence
- Performance Improvement
- Strategic Partnership

Five Priorities



- Access
- Employee Engagement
- Best Practices and Consistency
- Development of a High Performance Network
- Restore Trust and Confidence



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VULNERABLE POPULATIONS

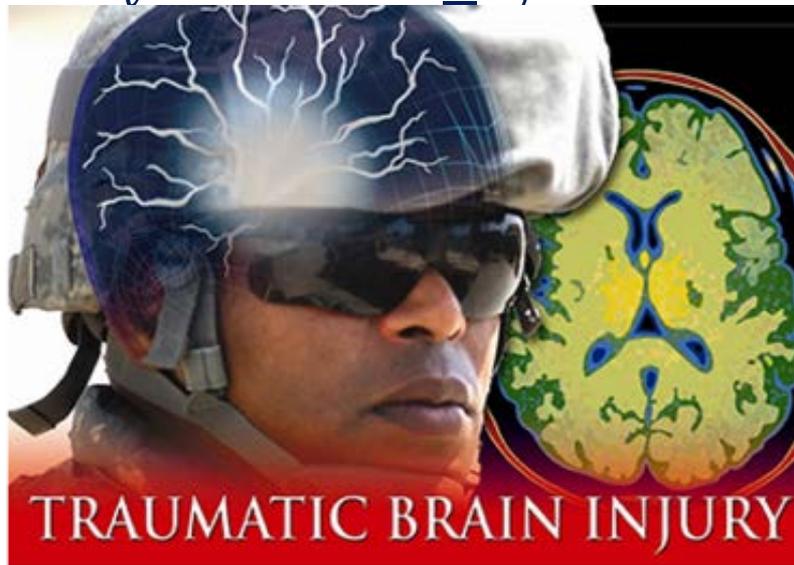
- Racial or Ethnic Group
- Gender
- Age
- Geographic Location
- Religion
- Socio-Economic Status
- Sexual Orientation
- Military Era /Period of Service
- Disability – Cognitive, Sensory, Physical
- Mental Health
- Other characteristics historically linked to discrimination or exclusion





SESSION INFO

- http://www.va.gov/HEALTHEQUITY/FHEA_Cyberseminar.asp



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Focus on Health Equity and Action

Concussion Expert Opening Comments on Veteran Traumatic Brain Injury Disparities

Bennet I. Omalu, MD, MBA, MPH, CPE,
DABP-AP, CP, FP, NP

Associate Clinical Professor of Pathology, University of California, Davis



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1. CTE is a progressive neurodegenerative syndrome caused by single, episodic or repetitive blunt force impacts to the head and transfer of acceleration-deceleration forces to the brain.
2. CTE presents clinically after a prolonged latent period as a composite syndrome of mood disorders, neuropsychiatric and cognitive impairment.





CTE: FOUR - PART DEFINITION – B - DR. OMALU

3. CTE usually presents with a prolonged latency period, however, some patients with CTE, may not exhibit the classic prolonged latency period before clinical symptoms begin.
4. Definitive CTE diagnosis remains direct brain tissue analysis:
 - i. Multifocal or diffuse taupathy [primary proteinopathy]
 - ii. Low grade and multifocal white matter rarefaction
 - iii. Low grade isomorphic fibrillary astrogliosis
 - iv. Neuropil microglial activation and histiocytes
 - v. Amyloidopathy, TDP-proteinopathy and other proteinopathies may be present [secondary proteinopathy].





PTE - DEFINITION - DR. OMALU

- **Clinico-pathologic syndrome induced by focal and/or diffuse, gross and/or microscopic destruction of brain tissue caused by primary or secondary brain trauma**
 - Not a neurodegenerative disease
 - Not progressive
 - Most recognized PTE subtype: Post-Traumatic Epilepsy [PTE]
- **Committee on Nomenclature of Head Injuries: 1964**
 - Dr. Edward Weiford, the President of the Congress of Neurological Surgeons





CTE

- Repetitive MTBI, Concussions, Subconcussions
- DTBI, Axonal Injury
- Normal Appearing Brain, No Focal Encephalopathy
- Neurodegenerative, progressive, primary and secondary proteinopathies

PTE

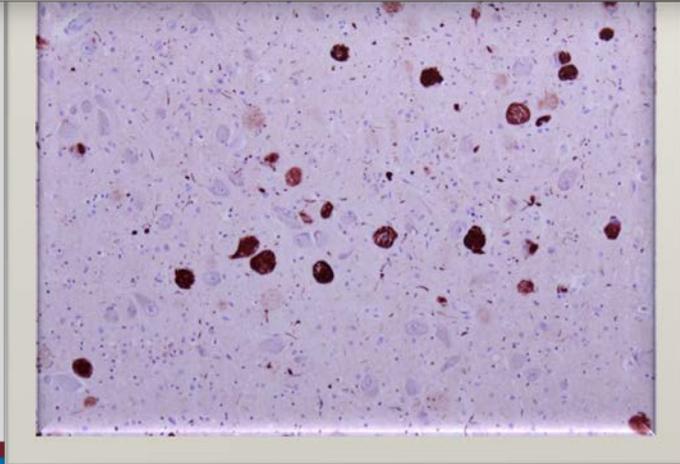
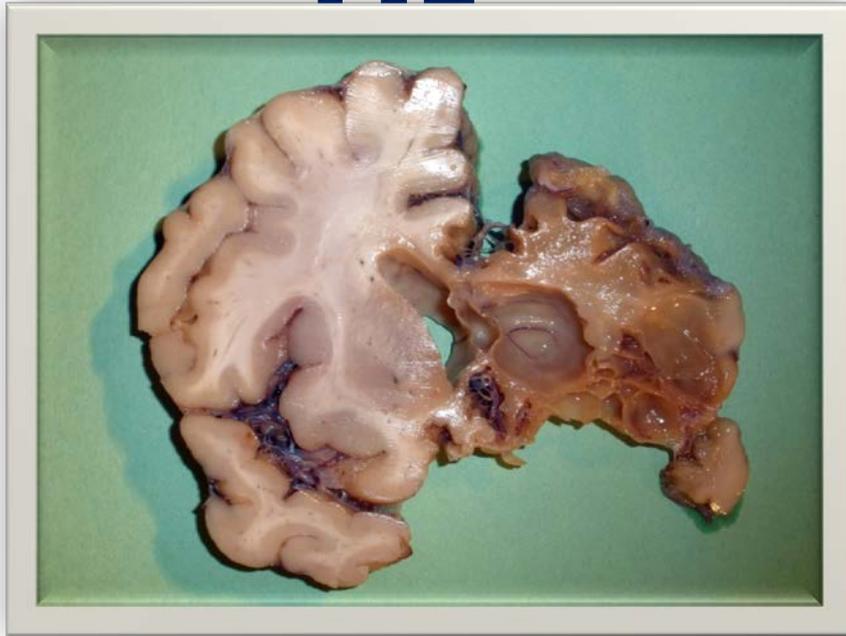
- Single, Episodic STBI
- FTBI, Cranial Fractures, ICH
- Physical Damage and Necrosis of Tissue: Focal Encephalopathy
- Non-neurodegenerative, non-progressive, no primary or secondary proteinopathy



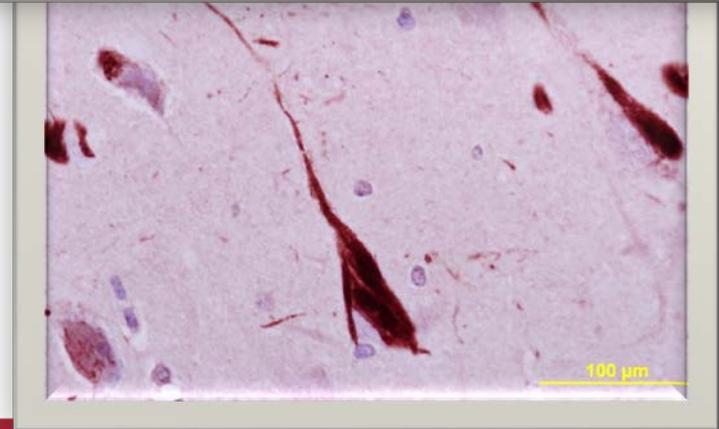


CTE VS PTE - DR. OMALU

PTE



CTE



Omalu, B.I.



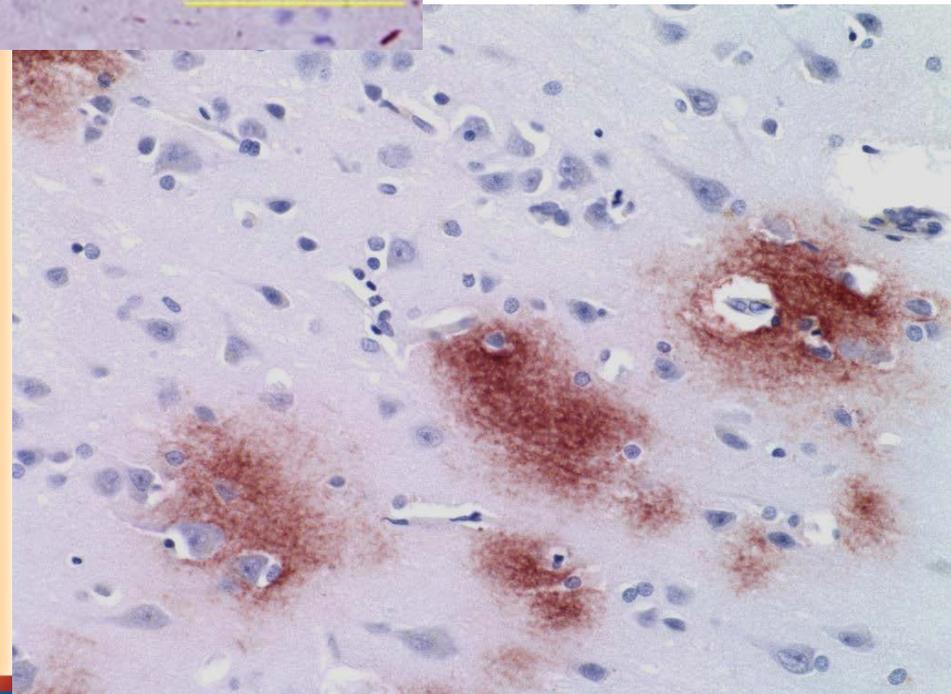
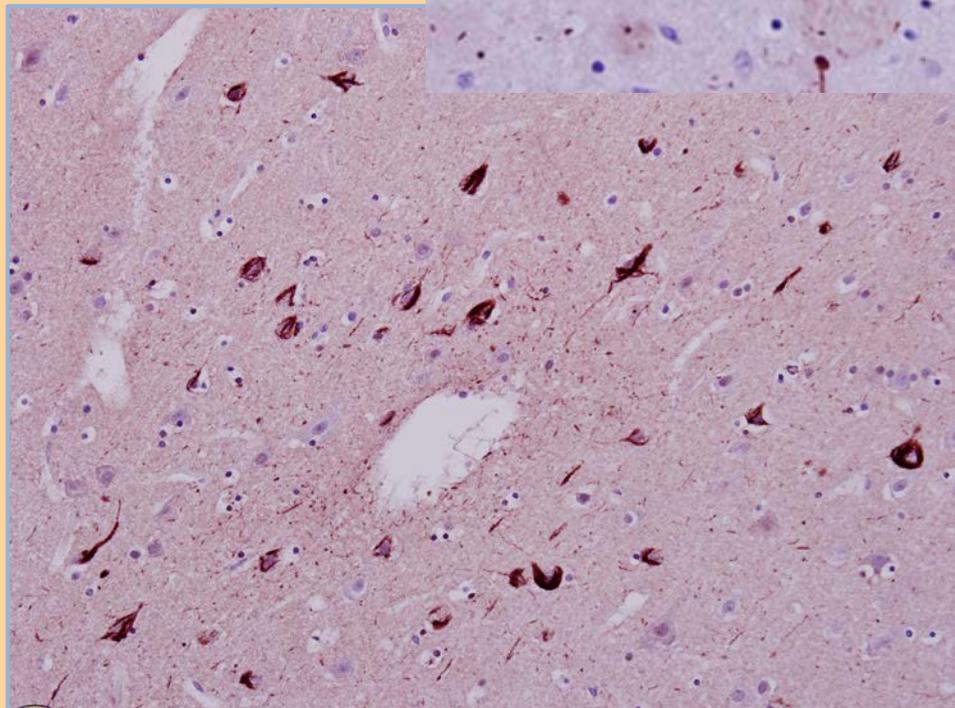
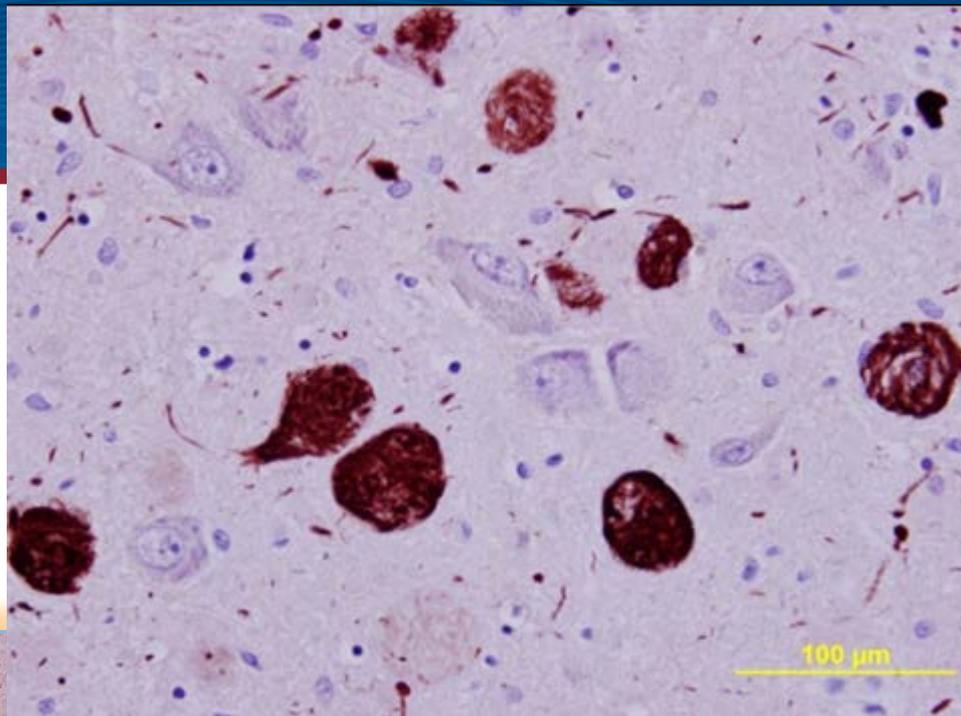
SYNTACTIC MATURATION OF CTE: 1700 – 2012

- DR. OMALU

- Cerebral neurasthenia
- Chronic traumatic brain injury/chronic brain injury
- Compensation hysteria
- Concussion neurosis
- Delayed traumatic apoplexy
- Dementia pugilistica
- Dementia traumatica
- Encephalopathia traumatica
- Litigation neurosis
- Postconcussion neurosis
- Postconcussion syndrome
- Post-traumatic concussion state
- Post-traumatic head syndrome
- Post traumatic stress disorder
- Post-traumatic psychoneurosis
- Punch drunk
- Terror neurosis
- Traumatic constitution
- Traumatic encephalitis
- Traumatic encephalopathy
- Traumatic encephalopathy of boxers
- Traumatic hysterias
- Traumatic insanity
- Traumatic neurosis
- Traumatic psychosis



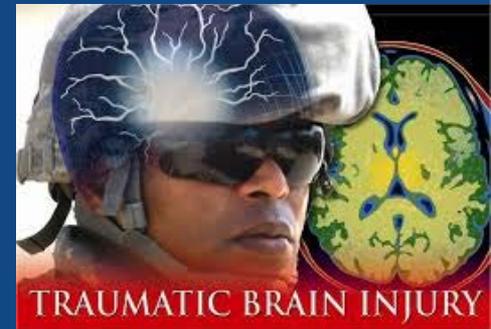
- DR. OMALU



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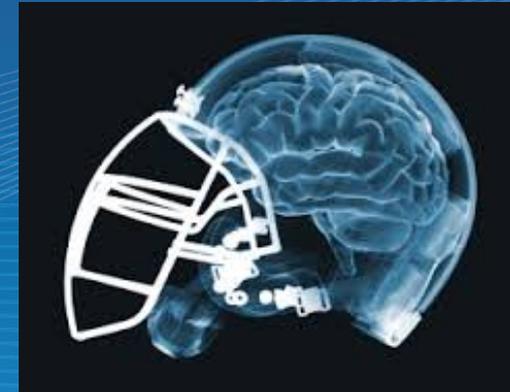
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VA TBI Expert Opening Comments on Veteran Traumatic Brain Injury Disparities

David X. Cifu, MD

Professor and Chairman
Virginia Commonwealth University

Senior Traumatic Brain Injury Expert
U.S. Department of Veterans Services



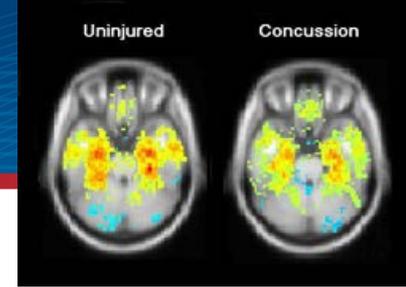
Concussion Consultant
Florida Panthers - NHL



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MYTHS OF MILD TBI – DR. CIFU



- There is scientific evidence that single concussions are associated with long-term risks.
- One week of rest after a concussion is usually sufficient to allow for return to sports.
- Newer neuroimaging techniques allow us to diagnose concussion accurately.
- There are emerging biomarkers to detect concussion.
- There are no evidence based treatments for symptoms of concussion.
- Most concussions from war are blast related and have poor outcomes.





MILD TRAUMATIC BRAIN INJURY – DR. CIFU



Injury caused by rotation not direct skull trauma



Concussion = mTBI

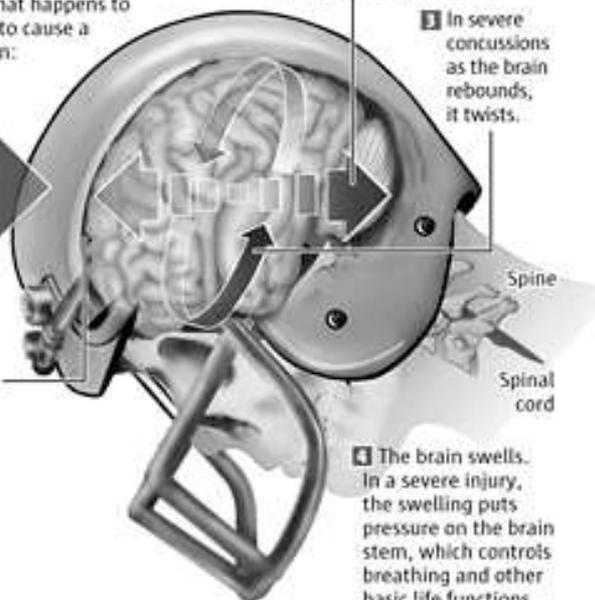
mTBI = Concussion

Anatomy of a concussion

Here is what happens to the brain to cause a concussion:

Initial impact

1



2 The force from the impact causes the brain to strike the inner surface of the skull and rebound against the opposite side.

3 In severe concussions as the brain rebounds, it twists.

4 The brain swells. In a severe injury, the swelling puts pressure on the brain stem, which controls breathing and other basic life functions.

Sources: Dr. Jay Rosenberg of Kaiser Permanente Medical Care Neurology; American Academy of Neurology; The Human Body

MARK NOWLIN / THE SEATTLE TIMES

Helmets prevent skull fractures not concussions



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COMBAT CONCUSSIONS – DR. CIFU



- 7-12% of OEF-OIF-OND Veterans who received VA medical care have confirmed TBI
 - ~75,000 total (>800,000 screened) in VA
 - 95% mild
 - <5% moderate-severe (2,500-3,000)
- >50% combat concussions due to MVC
- 73% of Veterans with symptomatic mild TBI also have mental health diagnosis, most commonly Post Traumatic Stress Disorder (PTSD)
- >90% also have either PTSD or chronic pain disorder





FACTORS ASSOCIATED WITH DEMENTIA– DR. CIFU

- **Vascular Health (Modifiable)**
 - Obesity
 - Hyperlipidemia
 - Smoking
- **Mental Health (Modifiable, Treatable)**
 - Stress
 - Mental Illness (Depression, GAD)
- **Activity (Modifiable)**
 - Physical
 - Mental (work, social interaction)
- **Other Neurologic Disease (Treatable)**
 - Parkinson's disease
- **Trauma (Preventable)**
 - TBI
 - ?Subconcussive Injury





SUMMARY – DR. CIFU



- >4 million concussions in US annually.
- Management of acute concussions and preventable factors of dementia is poor.
- While Service member/Veterans are at risk for concussions, their bigger risks are vascular, mental health and activity deficits.
- CENC is working on establishing long-term prospective cohorts to study chronic effects of combat concussions.



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Current Evidence of Racial/Ethnic Disparities in Traumatic Brain Injury

Leonard E. Egede MD, MS

Allen H. Johnson Endowed Chair & Professor of Medicine

Director, Charleston VA COIN

Director, MUSC Center for Health Disparities Research

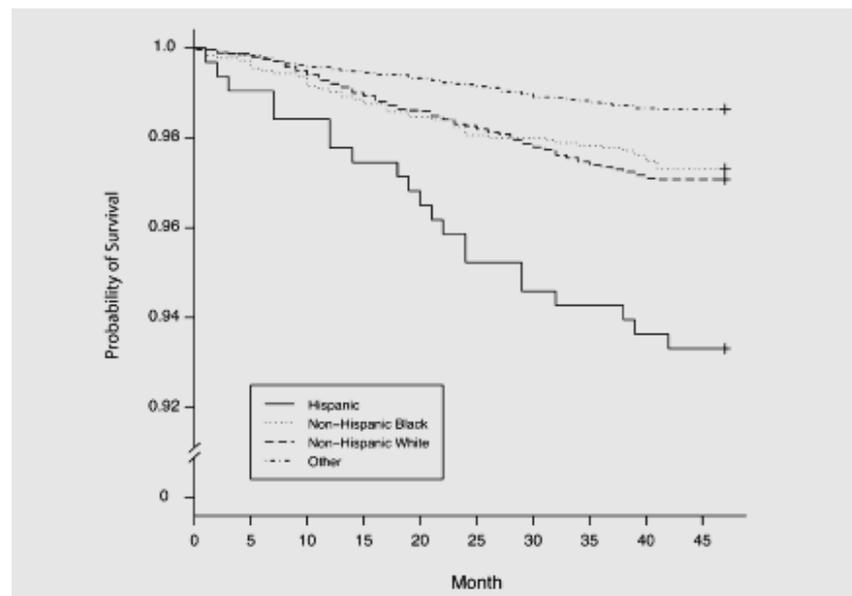


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DISPARITIES IN MORTALITY RISK - DR. EGEDE

- National cohort of 14,690 Veterans seen at VA medical centers in 2006 with clinically diagnosed TBI.
- Obtained date of death from vital status file for deaths between 2006-2009.
- Mortality rates significantly differed by race (6.69% Hispanics vs. 2.93% non-Hispanic).
- In regression models, Hispanic ethnicity was significantly and positively associated with higher risk of mortality (HR=1.61) compared to non-Hispanic whites after adjusting for comorbidities and socio-demographics.



Egede et al. AJPH, 2011





DISPARITIES IN UTILIZATION AND COSTS - DR. EGEDE

- Using the same cohort, utilization was shown to partially mediate the relationship between Hispanic race and mortality (HR=2.35 decreased to 1.58 and lost significance after mediation).
- Hispanic ethnicity was associated with lower likelihood of having TBI clinic, neurology, rehabilitation, and other types of clinic visits.
- Systematic review showed additional disparities in cost and utilization by race in general public.
- Non-white race associated with lower likelihood of placement for rehabilitation post-discharge.
- American Indians/Alaskan Natives had highest age adjusted rates of hospitalization for TBI.





DIFFERENCES IN COMBAT- AND NON-COMBAT SEVERITY - DR. EGEDE

- Cohort of Veterans seen in VA between 2004 - 2010 with clinically diagnosed TBI
- TBI classified as mild, moderate or severe
- Although non-Hispanic whites had overall higher odds of mild TBI, odds of mild TBI associated with combat exposure was significantly higher in Hispanics (OR= 3.42) and non-Hispanic blacks (OR= 2.48)
- Contrary to patterns in mild TBI, Hispanics (OR=1.47) and non-Hispanic blacks (1.44) had higher odds of moderate to severe TBI, but there was no differential moderating effect by combat exposure



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VA TBI Expert and Concussion Expert Discuss Veteran TBI Disparities

Questions – Moderated Session



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MODERATOR AND AUDIENCE QUESTIONS

- **What is TBI ?**
- **What is CTE?**
- **What is the connection between TBI & CTE?**
- **What are the implications for Veterans?**
- **What should the VA and Community at large know and do about TBI & CTE?**
- **What/where are the known disparities in TBI & CTE?**



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VA TBI Expert and Concussion Expert Discuss Veteran TBI Disparities

Audience Questions

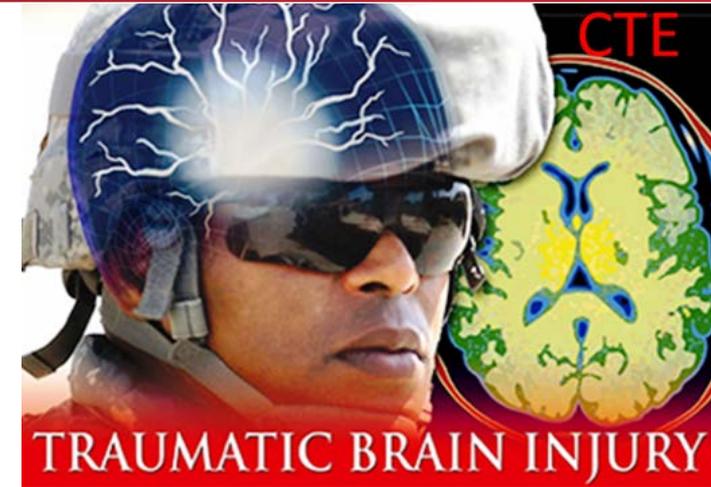


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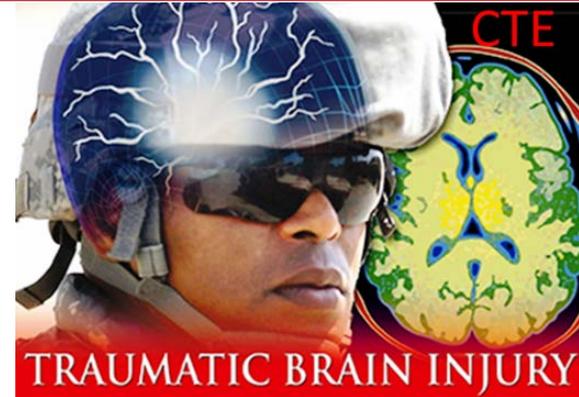
MODERATOR WRAP UP

- Take home/away points
- Dr. Omalu
- Dr. Cifu
- Dr. Egede
- Dr. Uchendu





- Repeated concussions:
Time to spur action among
vulnerable Veterans



American Journal of Public Health
e-View Ahead of Print June 16, 2016

doi: 10.2105/AJPH.2016.303293

Print: AJPH August 2016, Vol 106, No. 8





GET INVOLVED!

- The pursuit of Health Equity should be everyone's business.
- It is a journey that takes time and *sustained* effort.
- What can you do today in your area of influence to improve health equity?
- At a minimum - in all your actions - do not increase the disparity.
- Thank you!





POC INFORMATION & OHE WEBSITE

Uchenna S. Uchendu, MD

Uchenna.Uchendu2@va.gov

OHE website - <http://www.va.gov/healthequity/>

Sign up for our Listserv and continue the dialogue

Supplemental information available on OHE website

THANK YOU!



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VA TBI Expert and Concussion Expert Discuss Veteran TBI Disparities

Supplemental Slides



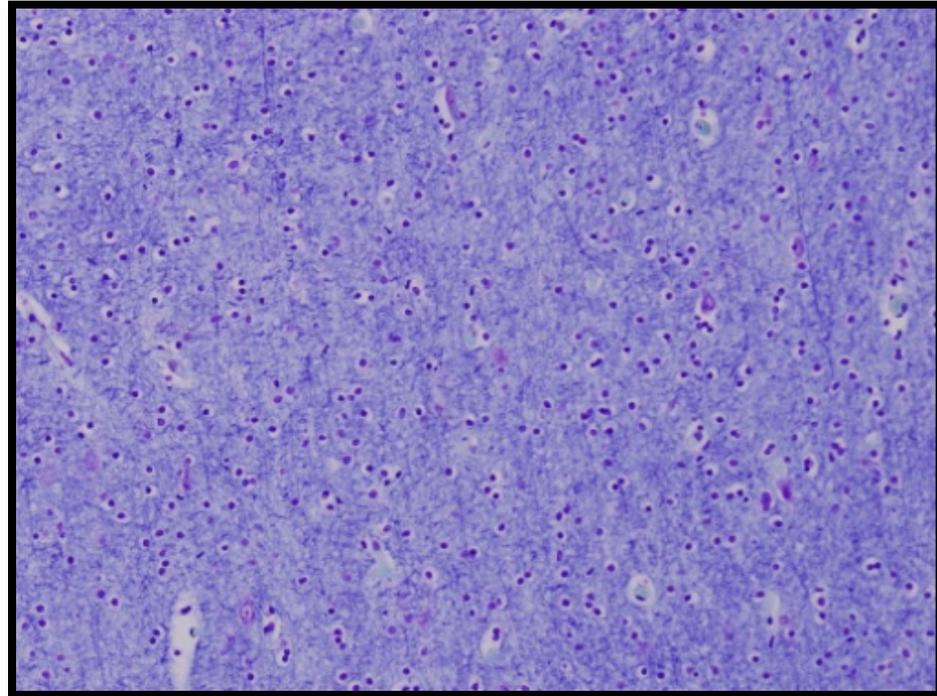
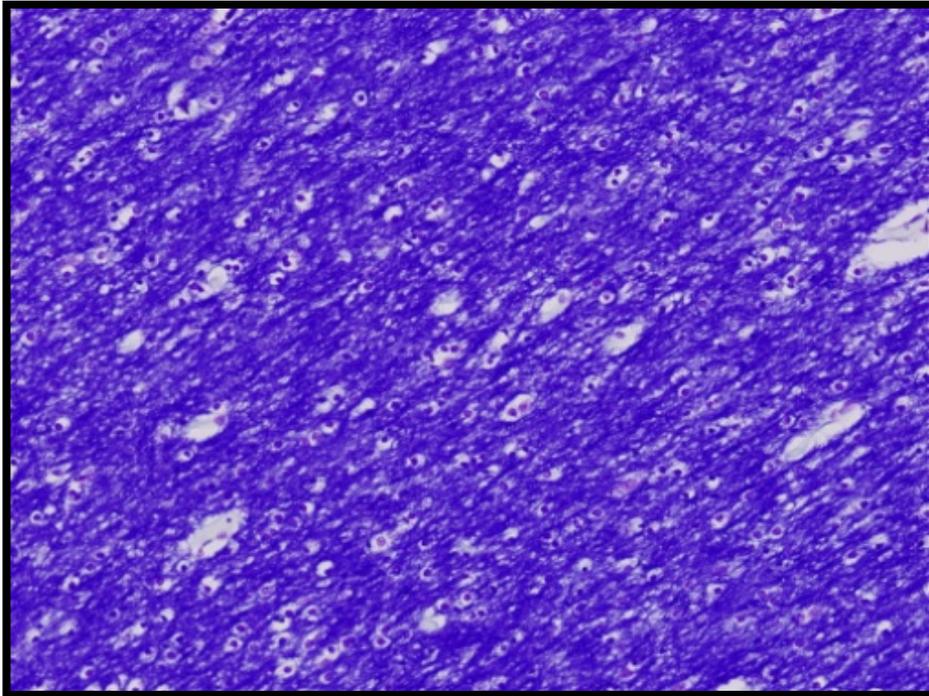
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FASCICULAR WHITE MATTER RAREFACTION AND DEMYELINATION- MULTIFOCAL AND PATCHY - DR. OMALU

Normal White Matter

CTE White Matter

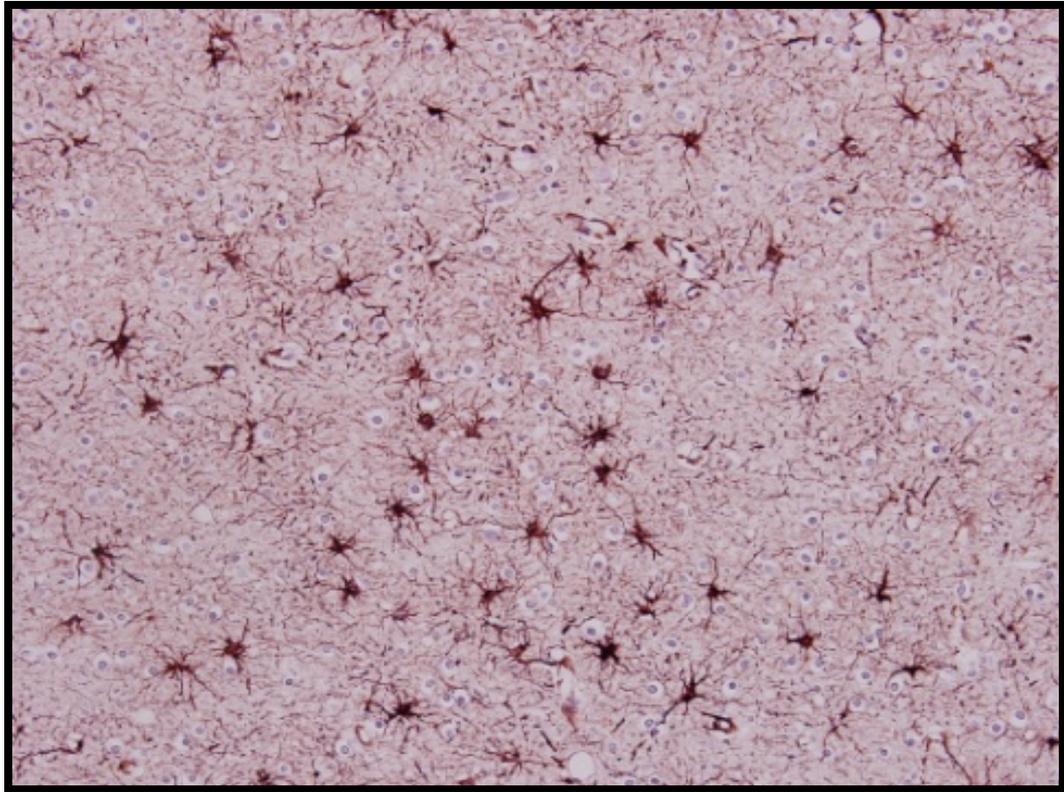


LUXOL FAST BLUE-CRESYL VIOLET [LFB-CV] HISTOCHEMICAL STAIN





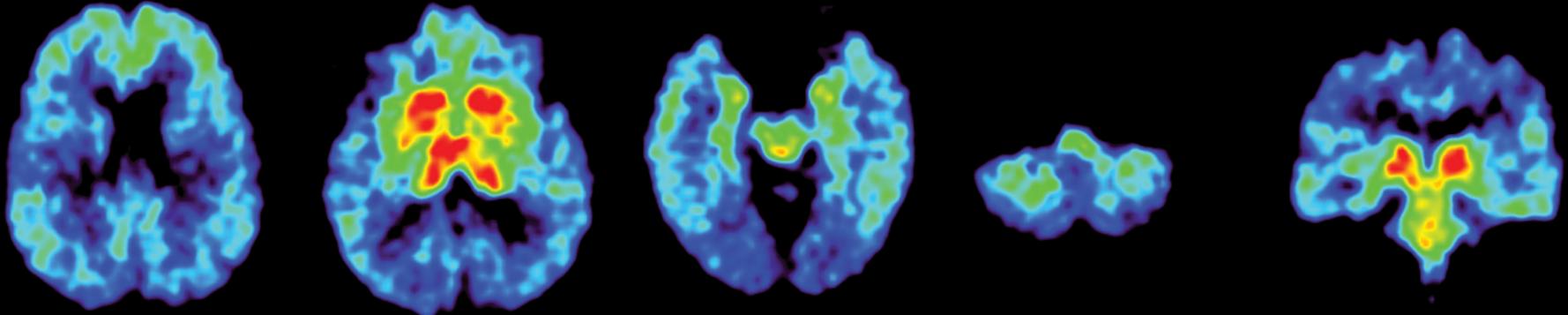
1. DIFFUSE LOW GRADE NEUROPIIL ISOMORPHIC FIBRILLARY ASTROGLIOSIS, WHITE MATTER
2. PERIVASCULAR AND NEUROPIIL HISTIOCYTES WITH NEUROPIIL MICROGLIAL ACTIVATION
3. SPARSE AND MULTIFOCAL PERIVASCULAR LYMPHOCYTIC SEEDING, VIRCHOW ROBIN SPACES





[F-18]FDDNP IN CTE - DR. OMALU

subject 24013 (retired NFL player)



Logan graphical analysis with cerebellar grey matter as reference region

[F-18]FDDNP DVR parametric images

DVR: 0.8  1.5

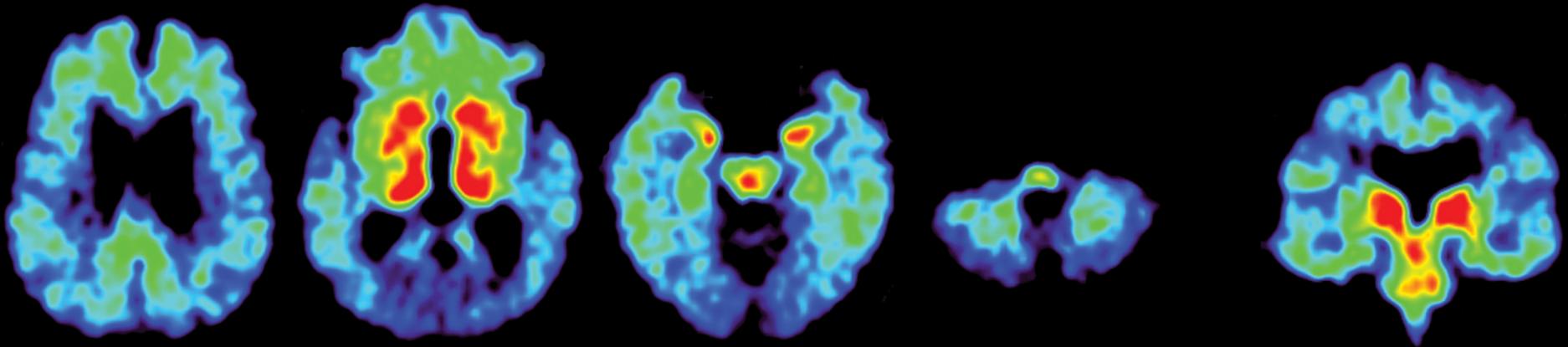




MORE TESTING: ON-GOING

- DR. OMALU

subject 24012 (retired NFL player T.D.)



Logan graphical analysis with cerebellar grey matter as reference region

[F-18]FDDNP DVR parametric images

DVR: 0.8  1.5





STAGING OF CTE: T-NUMBER STAGING CRITERIA

- DR. OMALU

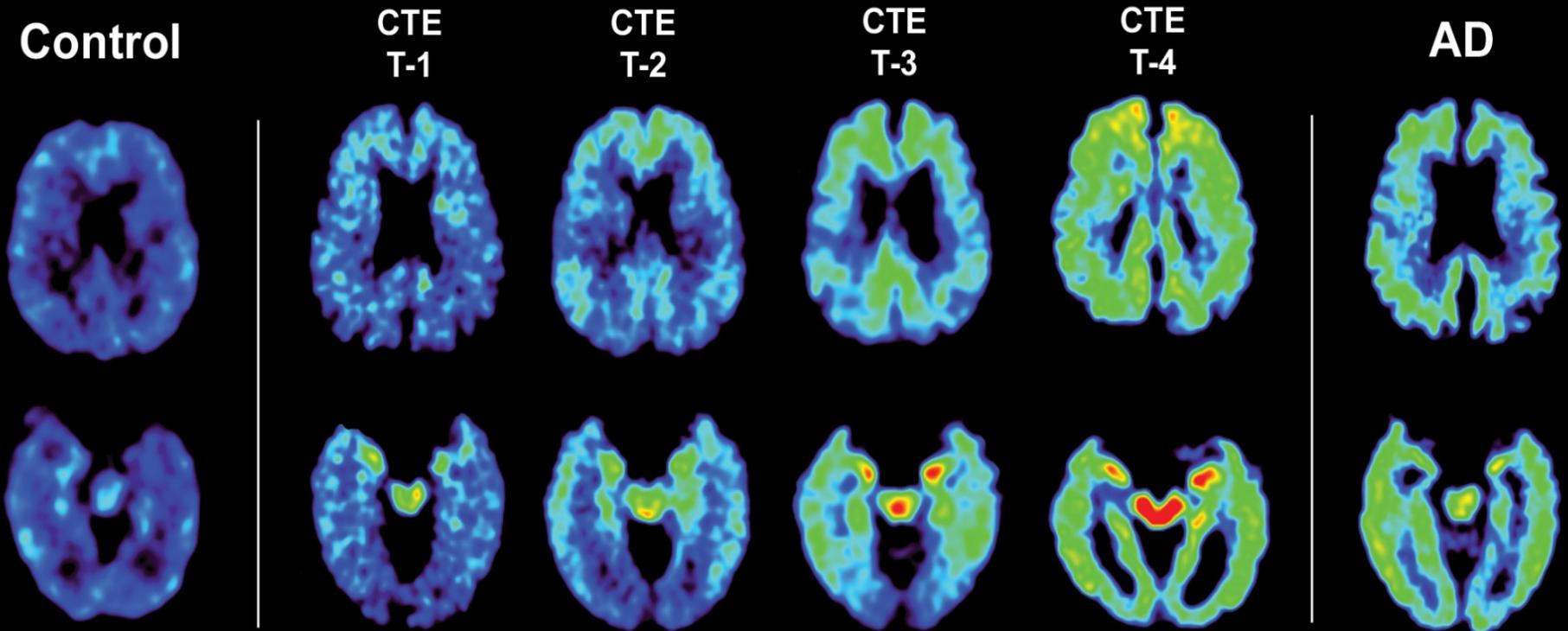
T-0 = Negative

T-1 = Mild subcortical involvement;

T-2 = Subcortical, including mid brain + amygdala and medial temporal lobe;

T-3 = T2 + partial involvement of other cortical structures;

T-4 = T2 + extensive cortical involvement with Alzheimer's or frontal lobe dementia patterns.





CTE IN THE MILITARY: BLAST VARIANT

- DR. OMALU

CONTROL

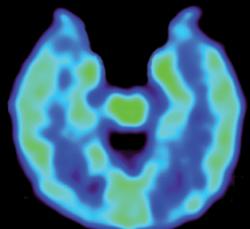
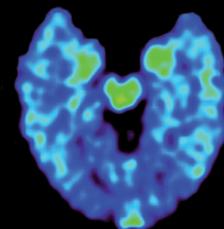
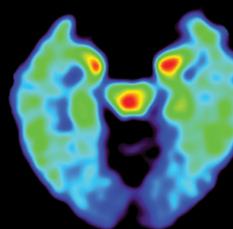
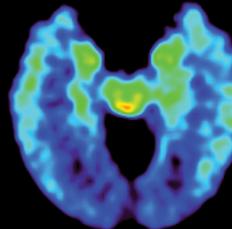
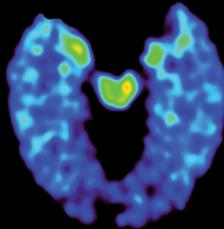
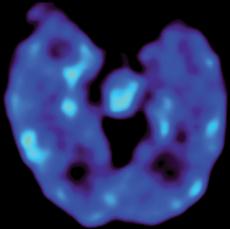
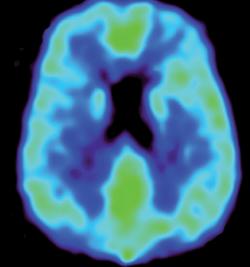
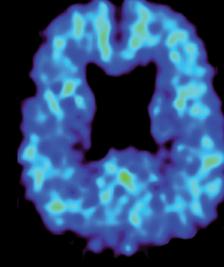
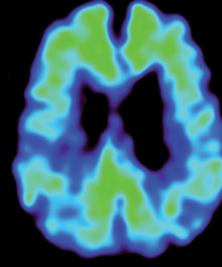
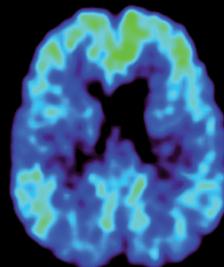
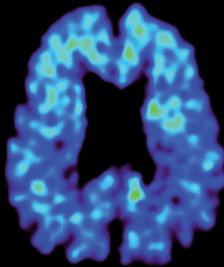
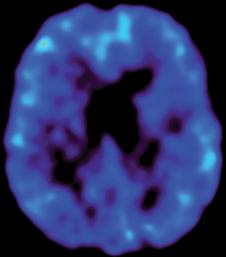
CTE
T-1

CTE
T-2

CTE
T-3

veteran
24010

veteran
24011





CTE IN AN IRAQ WAR VETERAN - DR. OMALU

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Neurosurg Focus 31 (5):E3, 2011

Chronic traumatic encephalopathy in an Iraqi war veteran with posttraumatic stress disorder who committed suicide

BENNET OMALU, M.D., M.B.A., M.P.H., C.P.E.,^{1,2} JENNIFER L. HAMMERS, D.O.,^{1,3} JULIAN BAILES, M.D.,^{1,4} RONALD L. HAMILTON, M.D.,⁵ M. ILYAS KAMBOH, PH.D.,⁶ GARRETT WEBSTER,^{1,2} AND ROBERT P. FITZSIMMONS, J.D.^{1,7}

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Following his discovery of chronic traumatic encephalopathy (CTE) in football players in 2002, Dr. Bennet

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CHRONIC EFFECTS OF NEUROTRAUMA CONSORTIUM - DR. CIFU

- Departments of Defense and Veterans Affairs-funded nationwide research consortium to study the short- and long-term effects of repeated concussions in combat injured servicemembers and Veterans.
- Five year, \$62.2 million award begun October 2013.
- CENC partners with NIH, NINDS, NCAA and NFL research groups to jointly study civilian, sports and combat concussions.





CHRONIC EFFECTS OF NEUROTRAUMA CONSORTIUM - DR. CIFU

- **Mission:**
- TBI research network for VA and DoD made up of federal, academic and private collaborators with rapid translation to public arena
- **Research Goals:**
- Identify and characterize anatomic, molecular and physiologic mechanisms of mild TBI and potential neurodegeneration
- Evaluate how co-morbidities (sensory, endocrine, psychologic) are associated with and exacerbated by mTBI and are related to potential neurodegeneration
- Assess efficacy of novel treatments and rehabilitative strategies for persistent symptoms of mild TBI and potential neurodegeneration

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Focus on Health Equity and Action

Thank you!

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