

University of Massachusetts Medical School

eScholarship@UMMS

---

UMass Center for Clinical and Translational  
Science Research Retreat

2013 UMass Center for Clinical and  
Translational Science Research Retreat

---

May 8th, 10:30 AM - 12:00 PM

## Traumatic Brain Injury: Translation from Animal Models and Genetics to Improving Outcomes

Susanne Muehlschlegel

*University of Massachusetts Medical School*

*Et al.*

Let us know how access to this document benefits you.

Follow this and additional works at: [https://escholarship.umassmed.edu/cts\\_retreat](https://escholarship.umassmed.edu/cts_retreat)



Part of the [Nervous System Diseases Commons](#), [Neurology Commons](#), [Translational Medical Research Commons](#), and the [Trauma Commons](#)

---

Muehlschlegel S, Henninger N, Carandang RA, Moore CM. (2013). Traumatic Brain Injury: Translation from Animal Models and Genetics to Improving Outcomes. UMass Center for Clinical and Translational Science Research Retreat. Retrieved from [https://escholarship.umassmed.edu/cts\\_retreat/2013/presentations/12](https://escholarship.umassmed.edu/cts_retreat/2013/presentations/12)

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 License](#).

This material is brought to you by eScholarship@UMMS. It has been accepted for inclusion in UMass Center for Clinical and Translational Science Research Retreat by an authorized administrator of eScholarship@UMMS. For more information, please contact [Lisa.Palmer@umassmed.edu](mailto:Lisa.Palmer@umassmed.edu).

# Traumatic Brain Injury

## Translation from Animal Models and Genetics to Improving Outcomes

Susanne Muehlschlegel, MD, MPH

Assistant Professor of Neurocritical Care

UMASS Depts. Of Neurology,  
Anesthesia/Critical Care and Surgery

Nils Henninger, MD

Assistant Professor of Neurology

UMASS Dept. Of Neurology

Constance Moore, PhD

Associate Professor of Psychiatry

UMASS Center for Comparative  
Neuroimaging

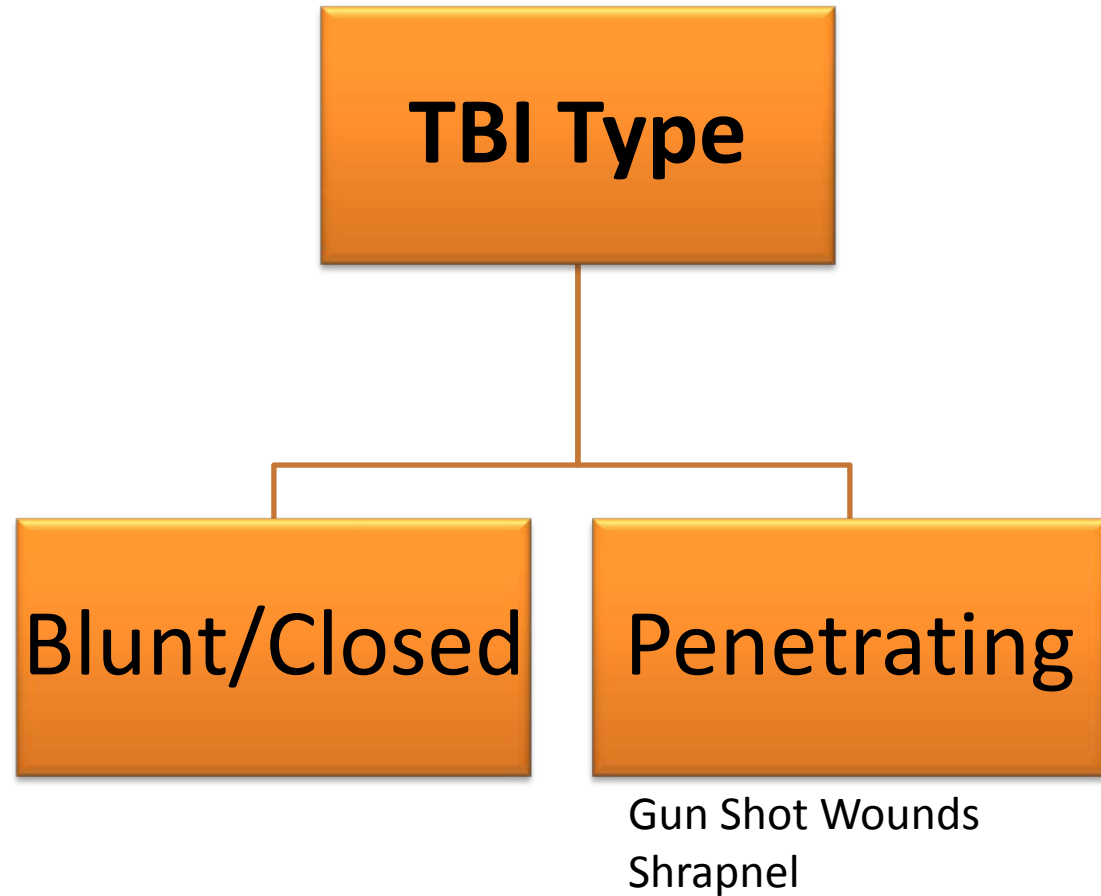
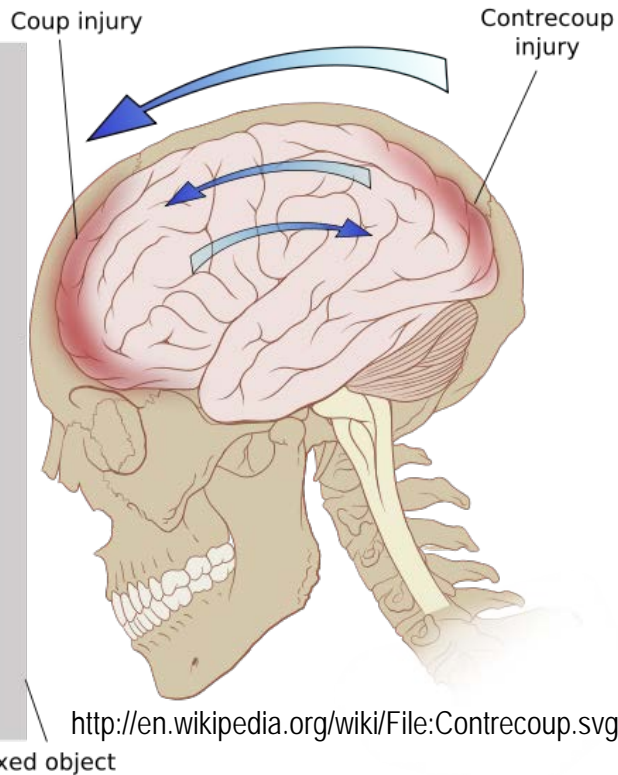
Raphael Carandang, MD

Assistant Professor of Neurocritical Care

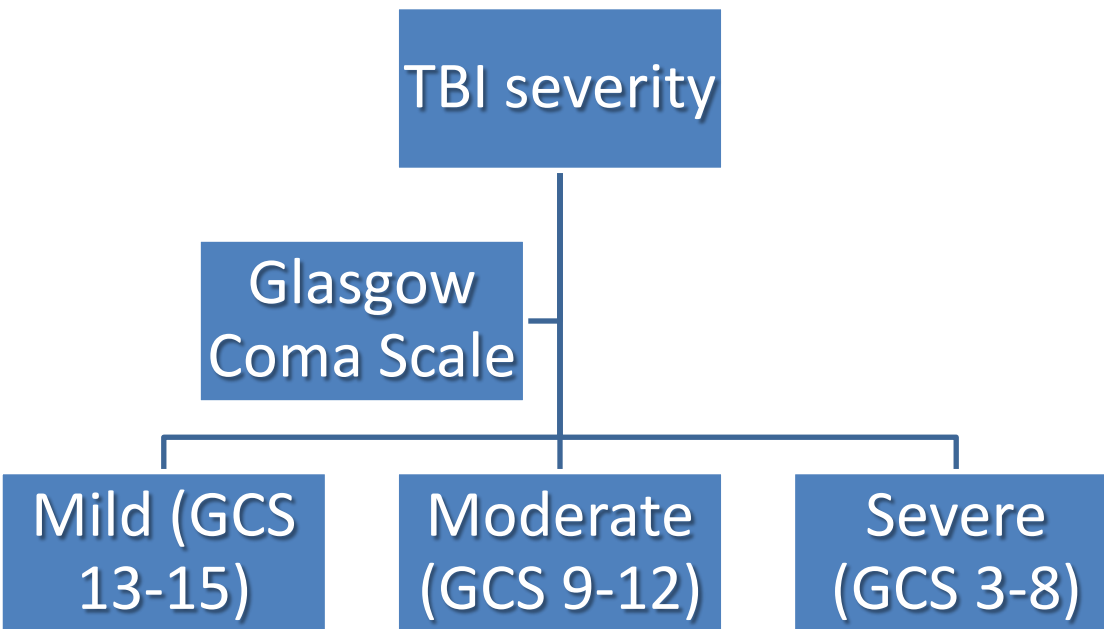
UMASS Depts. Of Neurology and Surgery



Traumatic Brain Injury (TBI) is due to a sudden forceful, mechanical injury to the brain.



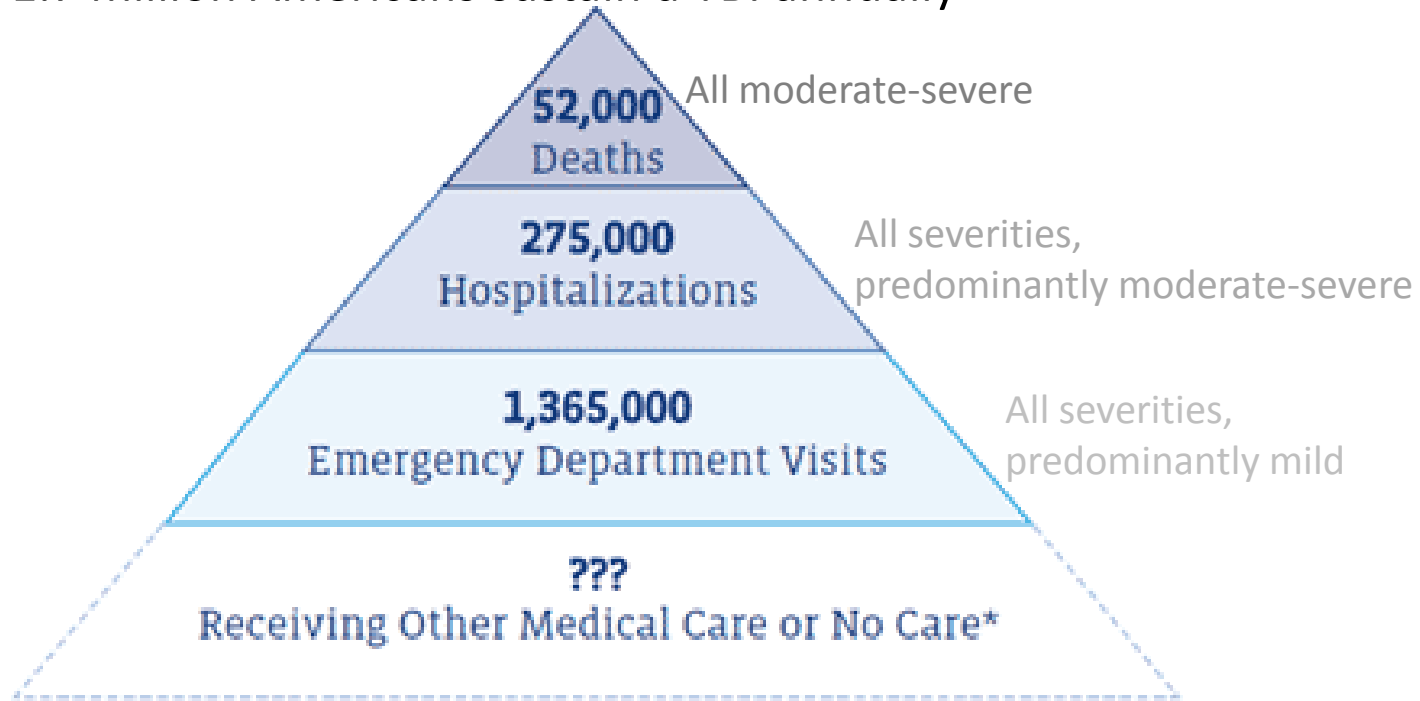
# The severity of TBI is determined by the Glasgow Coma Scale on presentation.



| The Glasgow Coma Scale (GCS) |                           |               |
|------------------------------|---------------------------|---------------|
| Feature                      | Scale Responses           | Score         |
| Eye opening                  | Spontaneous               | 4             |
|                              | To voice                  | 3             |
|                              | To pain                   | 4             |
|                              | None                      | 1             |
| Verbal response              | Oriented                  | 5             |
|                              | Confused conversation     | 4             |
|                              | Words (inappropriate)     | 3             |
|                              | Sounds (incomprehensible) | 2             |
|                              | None                      | 1             |
| Best motor response          | Obeys commands            | 6             |
|                              | Localizes                 | 5             |
|                              | Withdraws                 | 4             |
|                              | Flexion Posture           | 3             |
|                              | Extension Posture         | 2             |
|                              | None                      | 1             |
| <b>Total</b>                 |                           | <b>3 - 15</b> |

# Traumatic Brain Injury is a real public health problem in the U.S. (and worldwide).

Appr. 1.7 million Americans sustain a TBI annually



From: <http://www.cdc.gov/traumaticbraininjury/statistics.html>

- 25% of these are moderate-severe TBI.

# Falls and motor vehicle accidents are the most common causes of adult TBI.



From: [www.nutridesk.com.au](http://www.nutridesk.com.au)

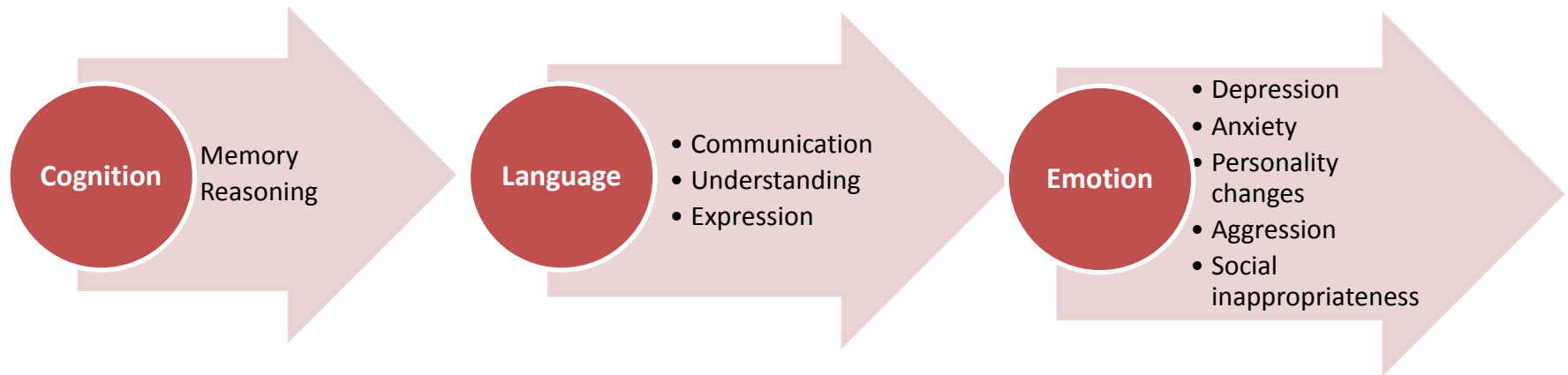
- Falls are the leading cause of TBI
- Fall-related TBIs older adults aged  $\geq 75$  years is increasing



From: [www.break.com](http://www.break.com)

Among all age groups, motor vehicle crashes and traffic-related incidents result in the largest % TBI-related deaths (31.8%).

# Long-term effects and poor outcomes require research to improve outcomes and develop new therapies.



Direct medical costs and indirect costs  
(lost productivity) of TBI:

**~ \$76.5 billion in the U.S. in 2010**

From: <http://www.cdc.gov/traumaticbraininjury/statistics.html>



[www.inquisitr.com](http://www.inquisitr.com)