



Who am I?

a narrative

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Outline

- Brain
 - neurons
 - pathways
- injury
 - rate
 - results
 - recovery
- History
 - before
 - change
 - now
- Work

The brain

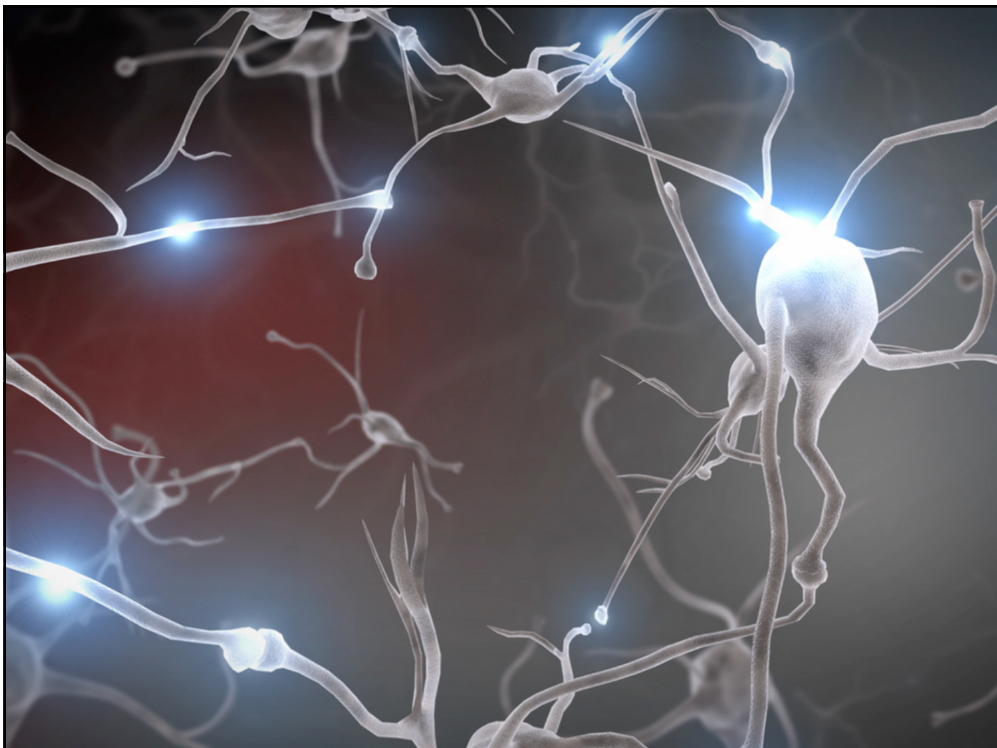
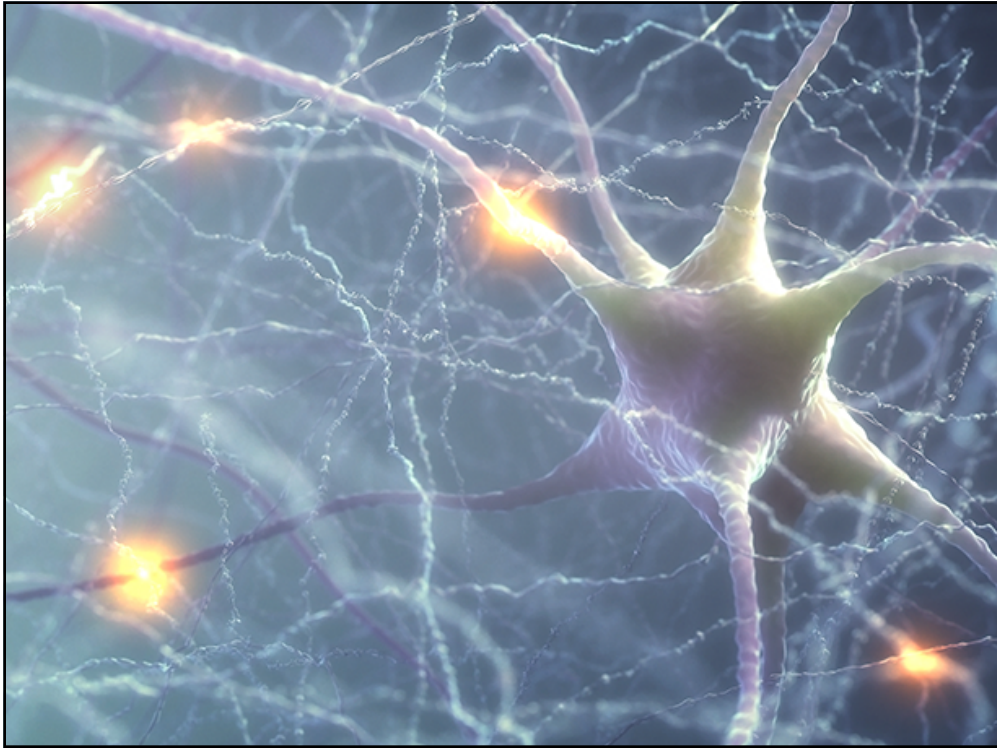
- magnificent and complex
- many parts - each with specific function
- regulates CNS
- regulates ability to speak, feel and process emotions



Brain injury

- Traumatic (external force)
 - Falls
 - Assaults
 - MV
 - Abuse
 - Violence
- Non-traumatic (internal force)
 - Stroke
 - Tumor
 - Seizure
- ABI — injury to the brain that is not hereditary, congenital, degenerative, or induced by birth trauma
 - Essentially, this type of brain injury is one that has occurred after birth.
 - Injury results in a change to the brain's neuronal activity — affects physical integrity, metabolic activity, or functional ability of nerve cells in the brain.





Incident rates

- 529,200 Pennsylvanians are living with Acquired Brain Injury
- 98,000 new traumatic brain injuries each year
- 86,240 Emergency Room visits for brain injury per year
- 11,133 hospitalizations from brain injury
- 2,078 die from brain injury each year

PA Leading Causes of Death, 2014	Deaths
1. Heart Disease	31353
2. Cancer	28692
3. Accidents	6640
4. Stroke	6576
5. Chronic Lower Respiratory Disease	6422
6. Diabetes	3765
7. Alzheimer's disease	3486
8. Kidney Disease	2798
9. Flu/Pneumonia	2541
10. Sepsis	2259

Recovery

- Varied and based on the individual and injury.
- Predicting the degree remains crude — months to years. Devastating and fatal injuries can be easier to ascertain than other injuries.
- Indicators the medical team uses for prognosis:
 - Duration of Coma. The shorter the coma, the better the prognosis.
 - Post-traumatic amnesia. The shorter the amnesia, the better the prognosis.
 - Age. >60 or <2 have the worst prognosis.
- Recovery of brain function occurs by several mechanisms. Some common theories:
 - Depressed areas of the brain that are not injured but linked to injured areas that begin functioning again.
 - The function is taken over by a part of the brain that does not usually perform that task.
 - Redundancy in the function performed so another area of the brain takes over.
 - Behavioral substitution. Learn new strategies to compensate for deficits.



<http://www.traumaticbraininjury.com>

Impact



- student

- auditory learner ("A")
- musical interest
- fit, not muscular
- outcast

- home

- compliant
- photography

- calm



- A severe brain injury results in cognitive deficits including difficulties with:

- Attention
- Concentration
- Distractibility
- Memory
- Speed of Processing
- Confusion
- Perseveration
- Impulsiveness
- Language Processing
- "Executive functions"

- student

- struggled to attain "B"
- musical frustration
- weight gain
- glass doll

- home

- angry
- photography

- outbursts



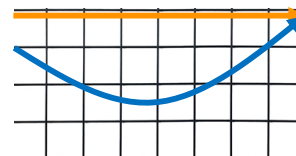
Return to school

- West Salem HS
- Rochester Institute of Technology
- Construction
 - Married/child
- University of Wisconsin - La Crosse
 - Dr. Gary Bender/lit. faculty
 - Testing/modified learning
- Dow Corning/MSU/DCC



DOW CORNING

3.95 GPA
2.63 GPA



Terms in school

Return to school

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- Construction
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- Dow Corning/MSU/DCC
- Kenosha Unified Schools
 - University of Wisconsin - Whitewater
- Flinders University
- South Dakota State University
- Drexel University



Kenosha Unified
School District



CWD

- Judy Summers-Gates
 - I have a PhD and I have a disability
 - I obtained my PhD with a disability
- Karl Booksh
 - Hidden disability
- John Johnston
 - Unique Abilities
- One step ahead of the rest



Nanotechnology

- Understanding and control at the nanoscale
 - Very small scale – one billionth (10^{-9}) m
 - Chem, bio, phys, mat sci, eng
- Used to create materials on larger scale
 - Bottom up
- Nanoscale particles are not new in either nature or science. However, the recent leaps in technology have given scientists new tools to understand and take advantage of phenomena that occur naturally when matter is organized at the nanoscale.



