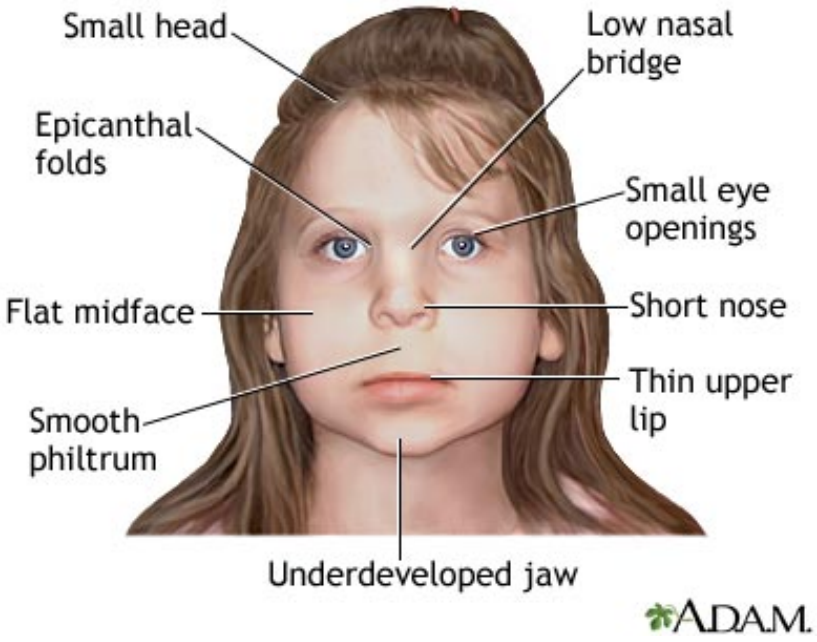
Nervous System Disorders

Fetal Alcohol Spectrum Disorder

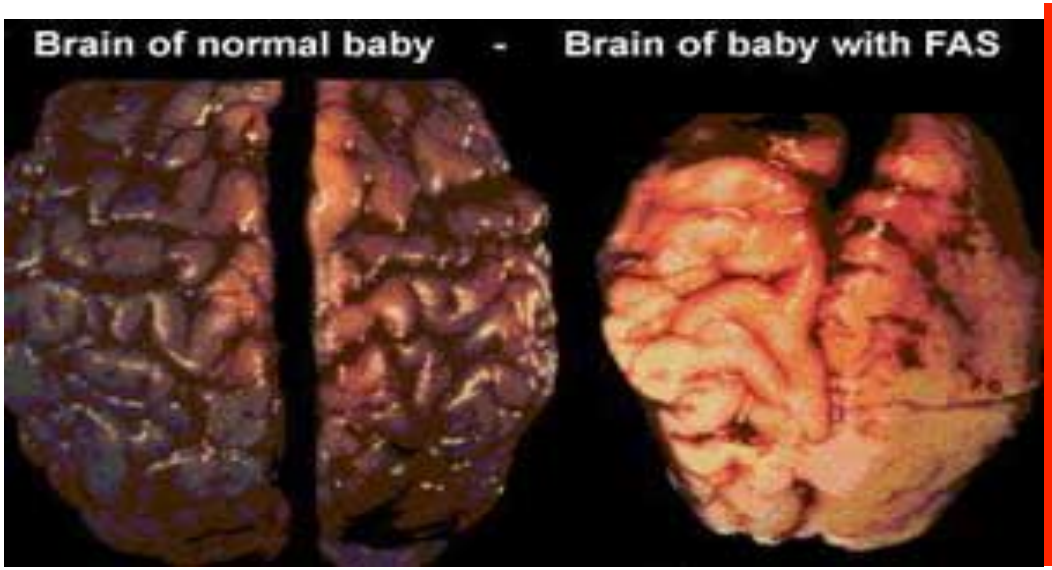
- Fetal Alcohol Spectrum (FAS) is used to describe a broad range of effects associated with alcohol use during pregnancy
- The spectrum can include **physical effects** as well as **effects on the brain** that may result in problems with **learning, emotions** and **behavior**.



Sometimes you can tell, sometimes you can't!

Fetal Alcohol Spectrum Disorder

- When a pregnant woman drinks, so does her baby
- The baby's growth can be altered and slowed
- The baby may suffer lifelong damage

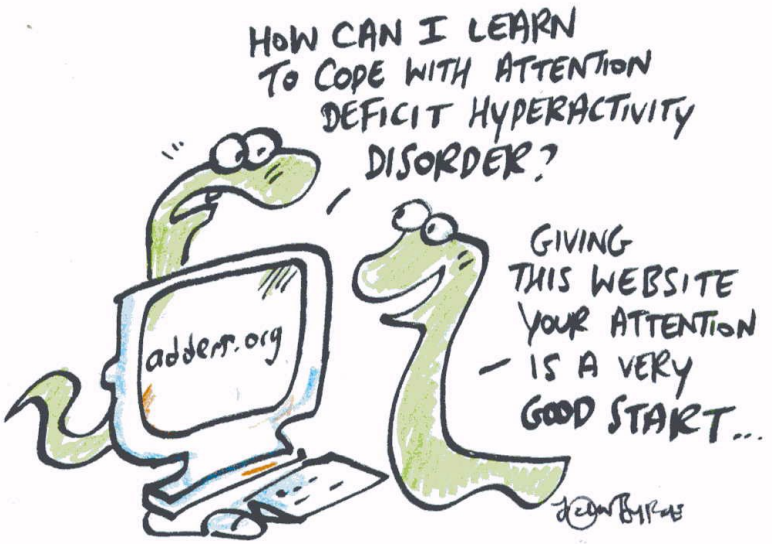


Smaller brain with less developed convolutions (which increase brain surface area)

There's no cure for fetal alcohol syndrome.

ADHD

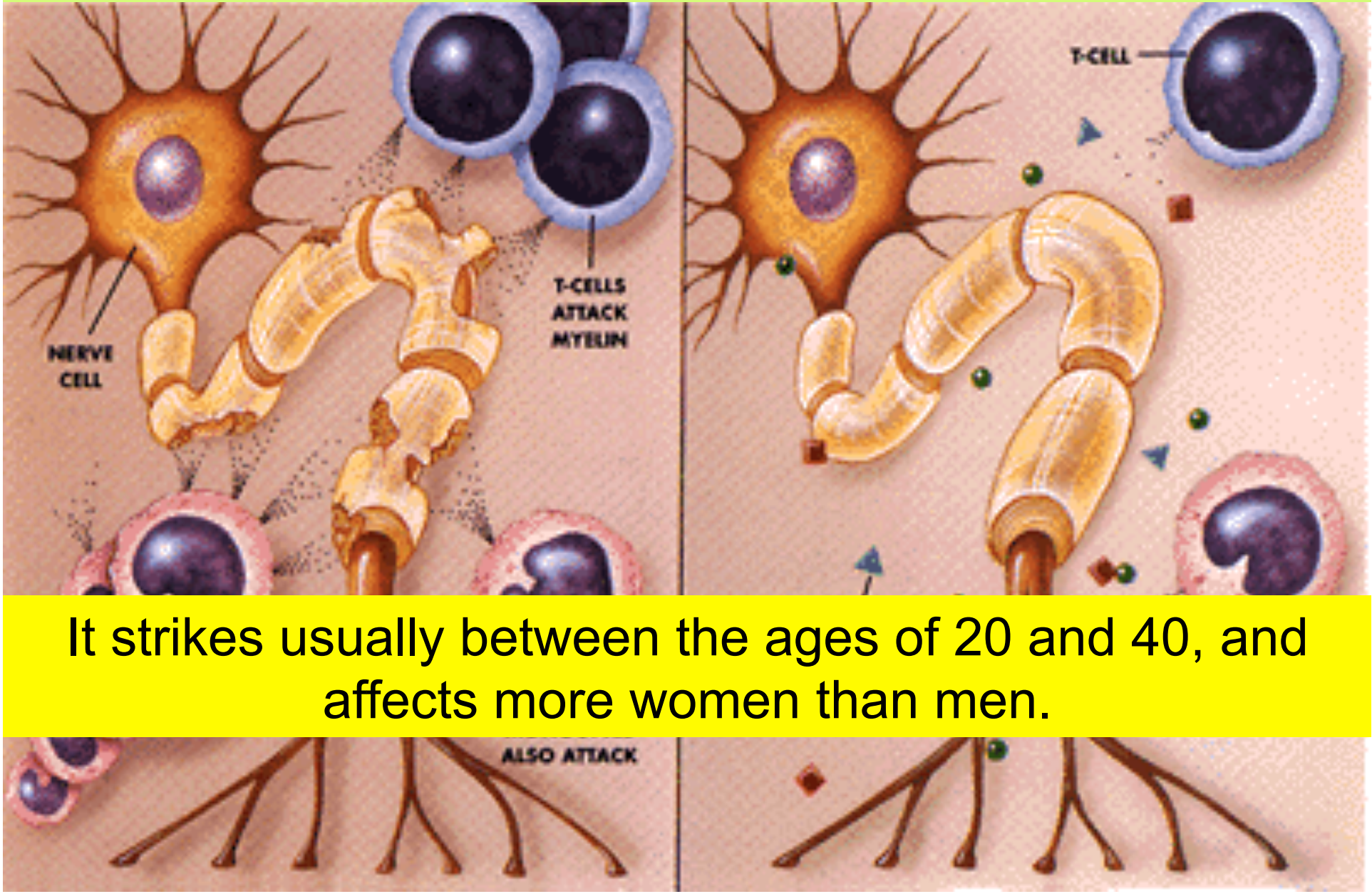
- Attention deficit/hyperactivity disorder
- Dopamine thought to be reabsorbed too quickly
- It does not spend enough time in the synapse
- Ritalin : increases dopamine & norepinephrine
- Ritalin also known as methylphenidate
- Long term effects unknown!



Multiple Sclerosis

- Multiple sclerosis is an autoimmune disease that affects the central nervous system (the brain and spinal cord).
- An acquired inflammatory, demyelinating disease - cells of the immune system invade the CNS and destroy myelin
- Both genetic and environmental factors have been implicated in the disease.

Multiple Sclerosis



It strikes usually between the ages of 20 and 40, and affects more women than men.

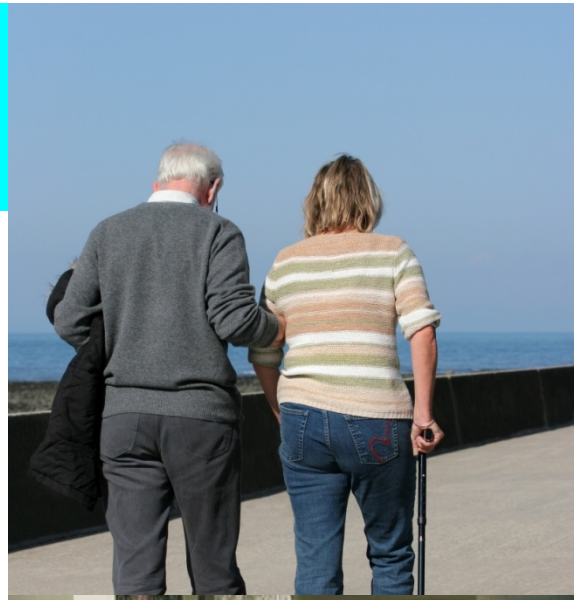
Multiple Sclerosis

- The inflammation **causes nerve impulses to slow down or become blocked**, leading to the symptoms of MS
- Many symptoms (differ based on what lobe is affected)
  - MS affects occipital lobe – **painful vision loss**
  - Hazy vision / bright lights
  - MS affects cerebellum – **difficulty walking**
  - These “episodes” can last for months

Multiple Sclerosis

- **Treatments:** medications (pain killers + promote myelination), wheel chairs, physical therapy to promote muscle growth, aqua therapy, leg braces/splint, occupational therapy, gene therapy

These would be considered technologies!!!



Parkinson's Disease

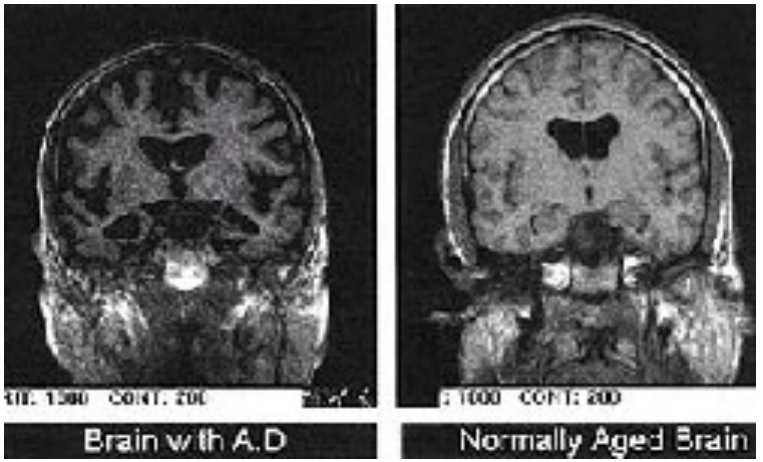
- Progressive degeneration of midbrain
- Midbrain loses it's ability to produce dopamine
- Dopamine is an opiate-like neurotransmitter
- Dopamine produces feelings of well-being
- Results in muscular tremors, partial facial paralysis and general weakness
- L-dopa given to slow dopamine breakdown

Did Hitler Have Parkinson's? Video

Alzheimer's Disease

- a progressive, degenerative disease of the brain, which causes thinking and memory to become seriously impaired.
- At this time, we do not yet know what causes Alzheimer's disease or how to stop its progression.
- Amyloid protein deposits or plaques form in cerebral cortex
- Memory affected
- Temporal lobe of cerebrum affected
- Scientists working to find ways to prevent plaque build up

More info on Alzheimer's disease:
http://www.alzheimer.ca/english/disease/whatisit-intro.htm



Alzheimer's Disease

Researchers have discovered that Alzheimer's disease:

- is not a part of normal aging
- affects both men and women
- is more common in people as they age -- most people with the disease are over 65
- is not caused by hardening of the arteries
- is not caused by stress

Alzheimer’s Disease

- Scientists are looking at three areas:
- **Family history**
  For a few families, there is a definite connection between family history and Alzheimer's disease. While for others, a family history of Alzheimer's disease puts them at greater risk than someone with no family history. Though knowledge in this area is growing, the connection to heredity is not fully understood.
- **The external environment**
  The cause of Alzheimer's disease may be in our environment -- perhaps something in the water, soil or air.
- **The internal environment**
  Alzheimer's disease may be caused by something within the body. It could be a slow virus, an imbalance of chemicals or a problem with the immune system.

Alzheimer's Disease Treatments

- **Cholinesterase inhibitors** help with the cognitive symptoms of Alzheimer's. They work by preventing the breakdown of a chemical messenger in the brain called acetylcholine, which is important for learning, memory, and attention.
- **Sensory therapies**. There is some evidence that sensory therapies such as music therapy and art therapy can improve Alzheimer's patients' mood, behavior, and day-to-day function. By stimulating the senses, these therapies may help trigger memory recall and enable Alzheimer's patients to reconnect with the world around them.

http://www.nia.nih.gov/alzheimers/publication/alzheimers-disease-fact-sheet

Alzheimer's Disease

Spinal Cord Injuries

- Spinal cord may be damaged by **disease or injury**
- If spinal neurons in cervical area damaged: result is complete **paralysis**
- This is known as quadraplegia
- If spinal neurons in lower back (lumbar area) are damaged: paraplegia
- Treatment: **wheelchair, stem cell transplants**