# Understanding & Living With Our Aging Brains

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## Aging

- Primary Aging
- Minimizing Secondary Aging

## Delirium: It's Reversible

- Depression
- Deprivation
- Drugs
- Disease

## Dementia

- Alzheimer's
- Stroke
- Parkinson's
- Infectious

## Normally Aging Brain

- Vulnerable regions
- Interference with cognition
- Counteracting interference
- The Best of Times

# Aging

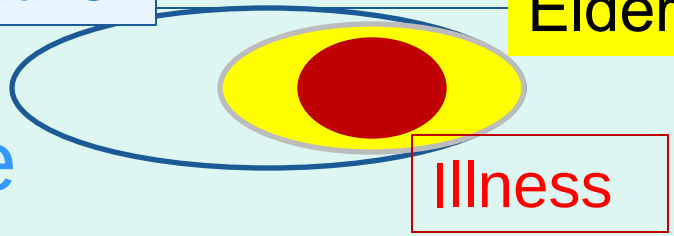
## Primary and Secondary Aging

- **Primary aging**
  - The universal and irreversible physical changes that occur to **all living creatures** as they grow older.

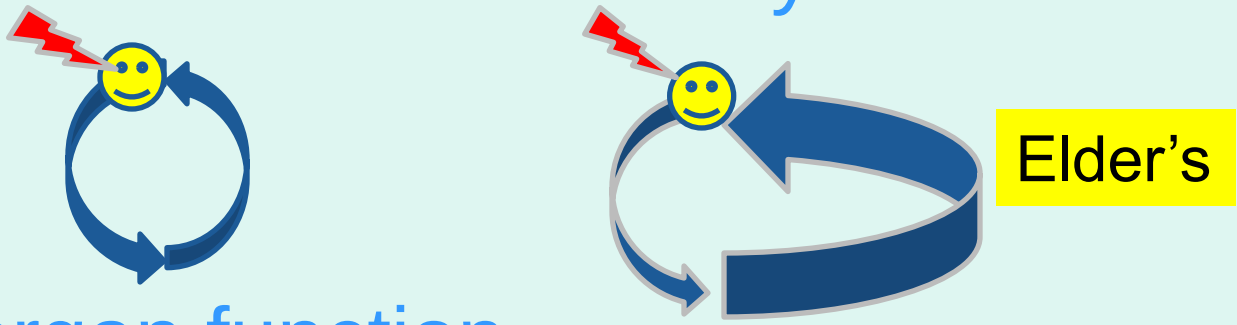
 

# *Primary Aging involves*

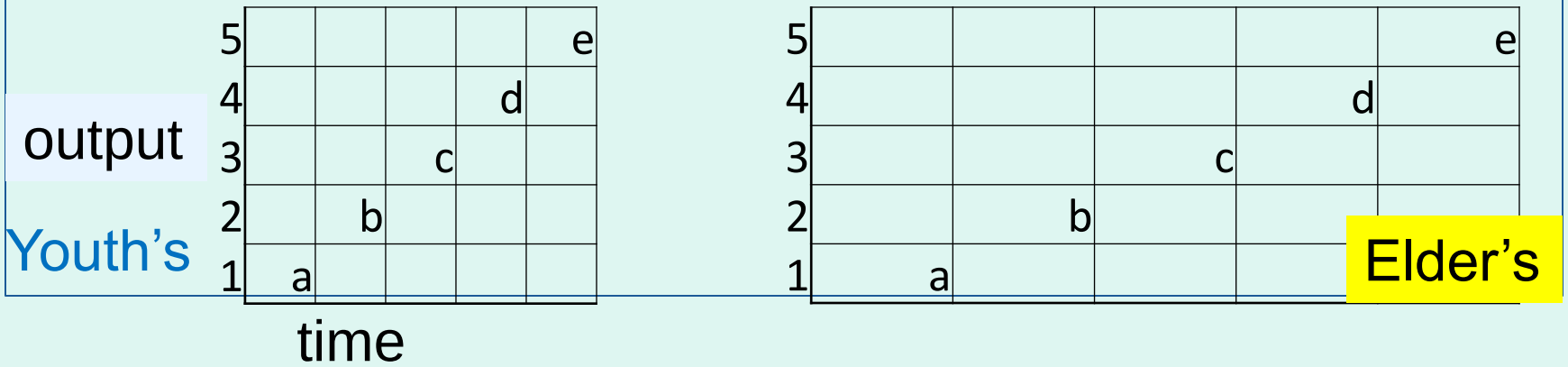
- Decreased organ reserve




- Slowed homeostasis recovery




- Slower organ function

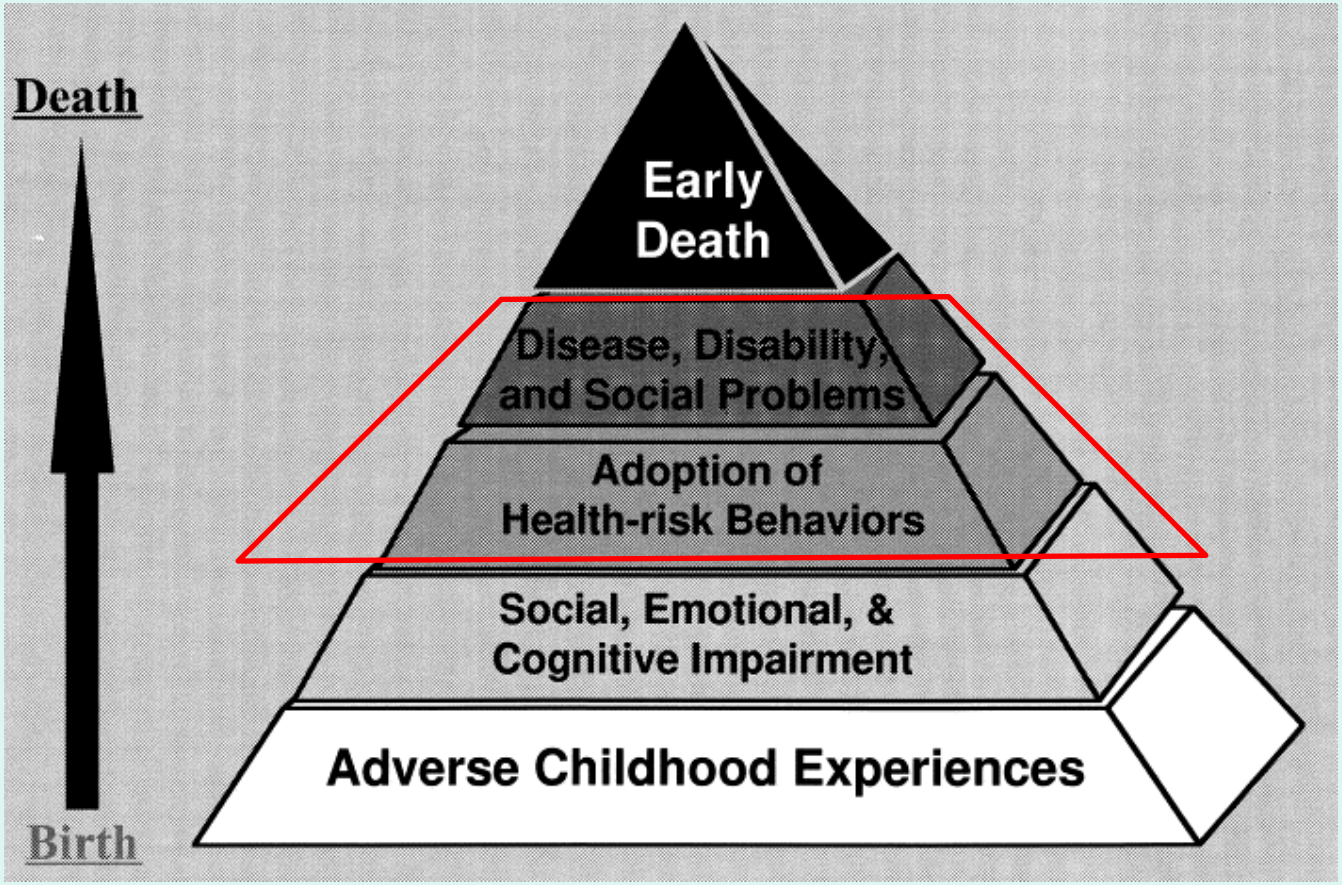


# Aging

- **Secondary aging**
  - The specific physical illnesses or conditions that become more common with aging
  - but result from poor health habits, genetic vulnerability, and other influences that vary from person to person

# Secondary Aging may occur due to Health-Risk Behaviors that result from social, emotional & cognitive impairment caused by ACEs – Adverse Childhood Experiences




*American Journal of Preventive Medicine* 1998 14, 245-258DOI: (10.1016/S0749-3797(98)00017-8)

# Secondary Aging:
## Cardiovascular Disease (CVD)

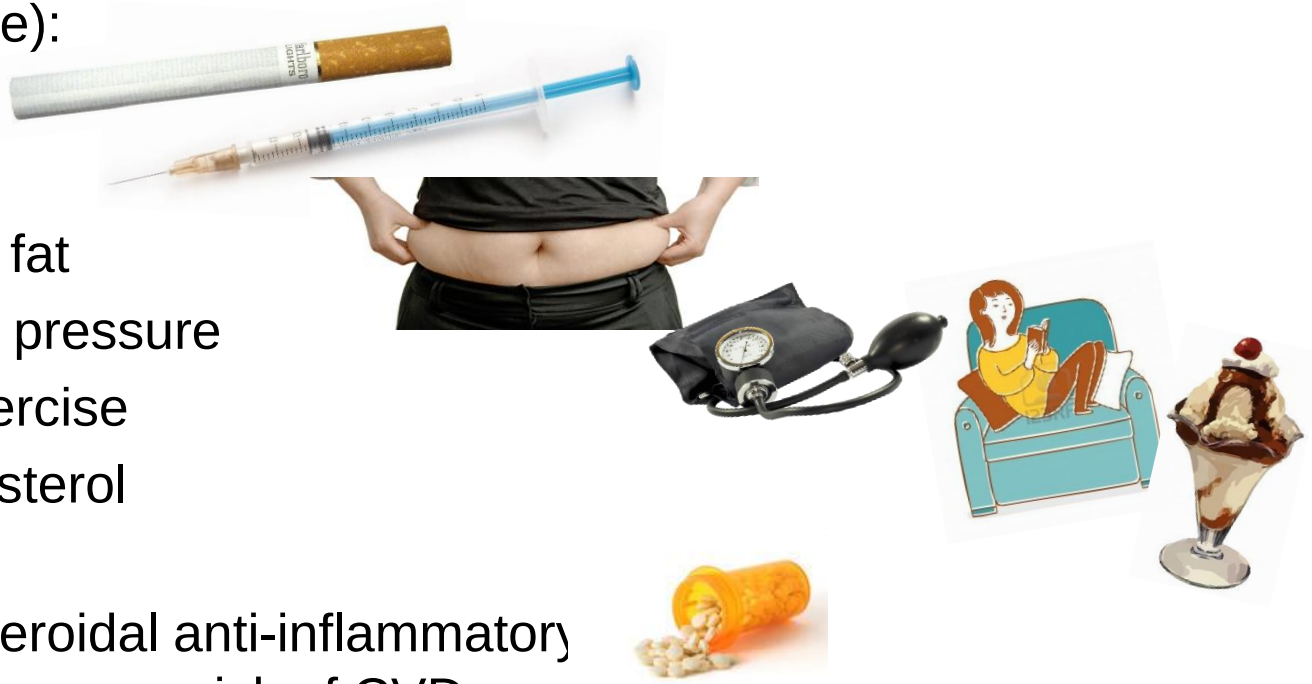
- CVD is considered secondary aging because not everyone develops it.
  - "diabetes, smoking, [more] abdominal fat, [elevated] blood pressure, [less] exercise, and [elevated] cholesterol" are major contributors to CVD (23.2.1)
- But
  - High blood pressure can be "primary" as genetic and age-related
  - Elevated cholesterol & weight can be genetic
- No single factor (including age, hypertension, inactivity, and smoking) makes CVD inevitable.

# High Blood Pressure and Cardiovascular Disease

## The Cardiovascular Health Study

- Participants: More than 5,000 people over age 65 in the U.S. without coronary problems at start of study.
- Six years later, some participants had developed heart disease.
- The likelihood of CVD was strongly related to six risk factors (all more common with age):
  1. Smoking
  2. Diabetes
  3. Abdominal fat
  4. High blood pressure
  5. Lack of exercise
  6. High cholesterol



Note: NSAIDs (non-steroidal anti-inflammatory drugs) except aspirin increase risk of CVD.

# Compression of Morbidity

## Minimizing Secondary Aging

- **Healthy lifestyle choices, health care and improvements in medicine, and technological aids →**
- **Postpone illness,** thus shortening the time a person spends ill or infirm before death.

North Americans who live to be 95 are *likely to be independent almost all of those years*

Berger, The Developing Person Through the Life Span, 8e. p 650. 

# SENESCENCE

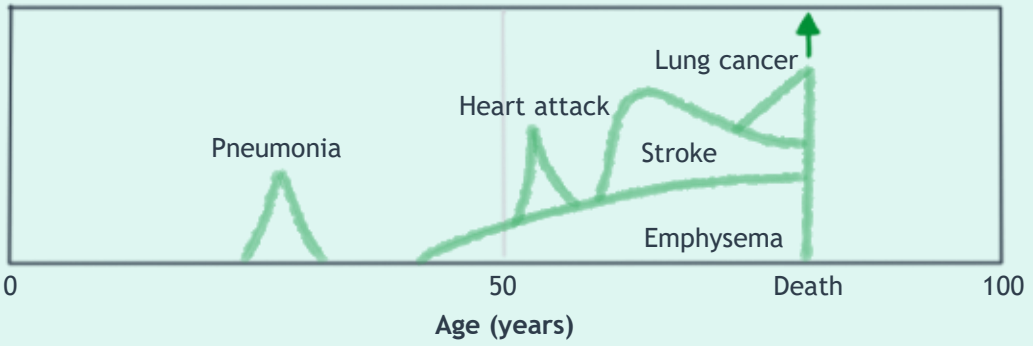
## Compression of Morbidity

***compression of morbidity*: A shortening of the time a person spends ill or infirm, accomplished by postponing illness.**

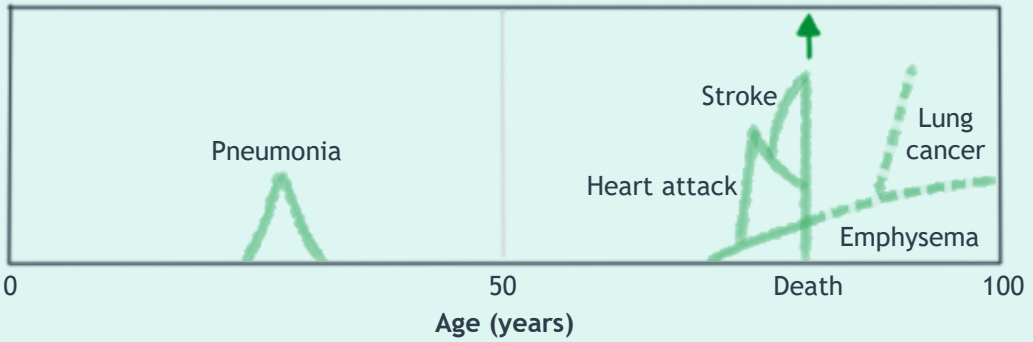
**How do twin brothers demonstrate compression of morbidity?**

### Compression of Morbidity in Twin Brothers

**Prototypic lingering chronic illness**




**Effects of the postponement of chronic disease**




*Source*: Fries, 1994.

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# The Impaired: Diseases that Affect the Brain

## Delirium: It's Reversible

- Depression
- **Deprivation:** Dehydration, Food, Nutrients, Oxygen, Sleep
- **Drugs:** Dose, Timing, Duplication, Combinations
- **Disease:** Infection: UTI, Sepsis, Covid. Brain tumor or trauma. Metabolic

## Dementia

- Alzheimers
- Stroke
- Parkinsons
- Chronic Infection

# The Impaired: Diseases that Affect the Brain

- **Dementia**
  - "Irreversible loss of intellectual functioning caused by organic brain damage or disease."
  - Becomes more common with age, but it is abnormal and pathological even in the very old.
  - Very slow progression.
- **Delirium**
  - A temporary loss of memory and disorientation, often accompanied by hallucinations, terror, grandiosity, labile mood and irrational behavior.
  - More rapid onset.
  - Reversible.

Berger, K.S. (2014) *Invitation to the life span*, 2e. Pp 519-520. .

# Delirium: It's Reversible

## Characteristics of Delirium


- Disoriented, confused
- Lethargy or agitation
- Sleep Disturbance
- Personality Changes
- Rapid changes over a short period of time.

**Repeating patterns of variation day to day?**

Suspect something ingested –
medications, alcohol etc.

# Causes of *dddd*Delirium

**Depression**

**Deprivation:**

Dehydration, Food, Nutrients, Oxygen, Sleep

**Drugs:**

Dose, Duplication, Timing, Combinations

**Disease:**

Infection: UTI, Sepsis, Covid, Pneumonia, Fever

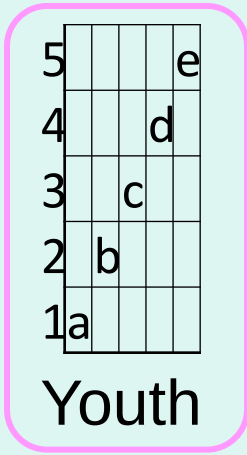
Brain tumor or trauma

Metabolic

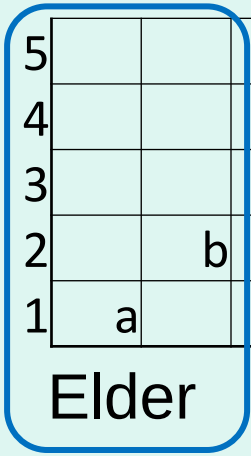
# Drugs: Slower Chemical Clearing

- With age, bodies become less efficient at digesting food, using its nutrients & clearing chemicals from the body via liver & kidney. (*slowed organ output)*
- *Elders tend to need lower doses of medicine than when younger.*
- **Polypharmacy:** When the elderly are prescribed several drugs and the side effects can cause dementia symptoms
  - Some drug combinations can produce confusion and psychotic behavior
  - Elderly may add over-the-counter med, substitute less expensive drugs, be imprecise in time, & double doses if forgot had already taken medicines. And they may become addicted and/or alcoholic.

*In the family – Understanding,* pill dispensers & a timer.




Organ Output




Berger, K.S. (2014) *Invitation to the life span*, 2e. p.525-526 .

# When mental decline is reversible:

- Accurate diagnosis is crucial when a person is wrongly thought to have dementia.

  Mini-Mental State Examination (MMSE) – a test that can help differentiate permanent vs reversible.

- The **most common** reversible cause of dementia-like symptoms in the elderly is depression.
- Malnutrition, dehydration, brain tumors, physical illness and overmedication *[and substance abuse/excessive alcohol]* can cause dementia-like symptoms.
- If NOT living alone, better chance that:
  - Is not depressed or drinking excessively,
  - is eating right & taking meds correctly, and
  - deterioration is recognized & medical care obtained.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 524.

# Dementia: Gradual "steady" deterioration

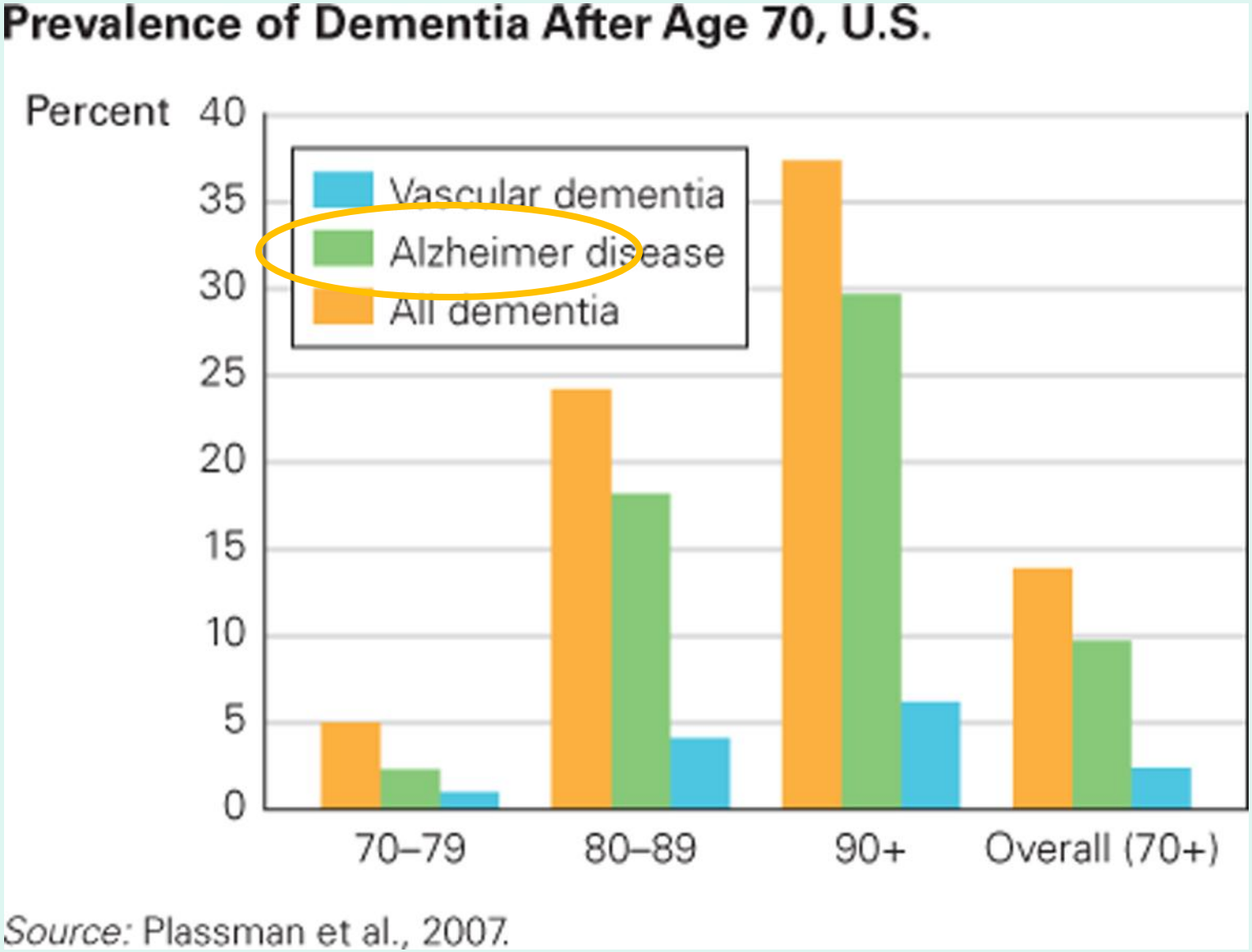
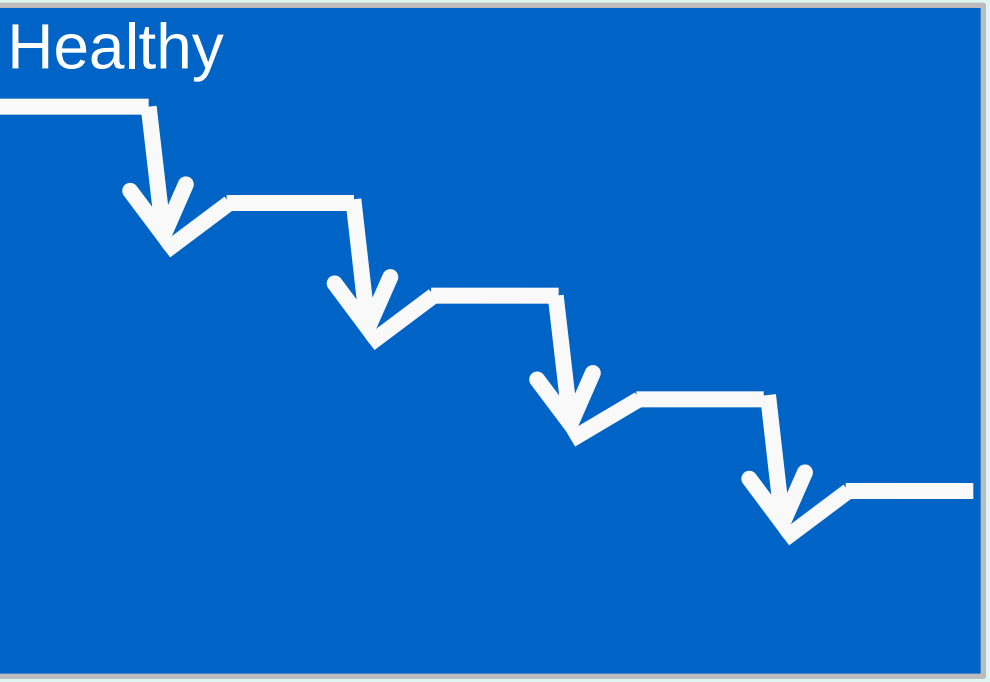
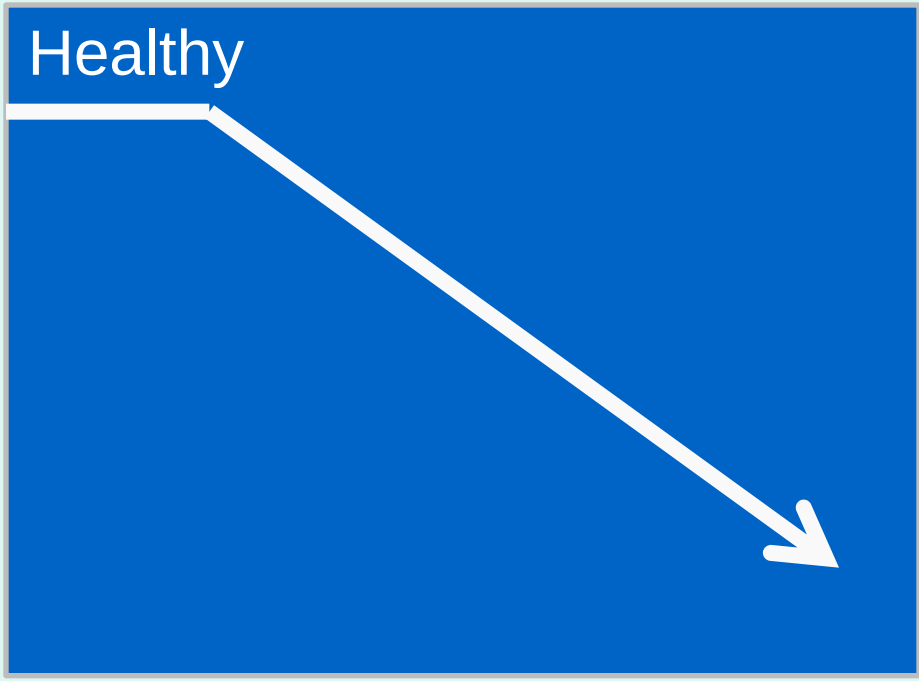



**Figure 14.5 Not Everyone Gets It** Kathleen Stassen Berger: *Invitation to* The Life Span, Second Edition

# Progression of Loss from Dementia




Multi-Infarct Dementia




Alzheimer's Dementia

# Stroke –
# there's treatment if you act FAST.

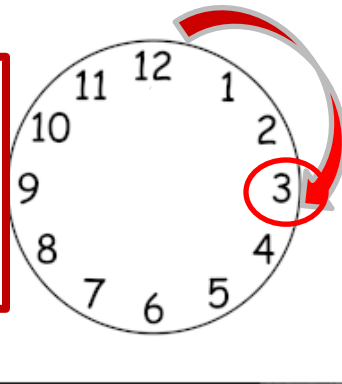
**F**ace
Face look uneven?

**A**rm
One arm hanging down?

**S**peech
Slurred speech?


**T**ime
Call 911 NOW!

With a STROKE, the Goal is to
verify the diagnosis of stroke due to clot or plaque &,
give "clot busting" medication within 3 hours of onset.



Unlocking the Silent Prison

**Caregivers are learning a better way to communicate with Alzheimer's patients**

***by: Christine Wicker*** **PARADE MAGAZINE, NOVEMBER 21, 2010**

Eighty-year-old Mary studied her only daughter's face intently. "You're not my Susan," she said.

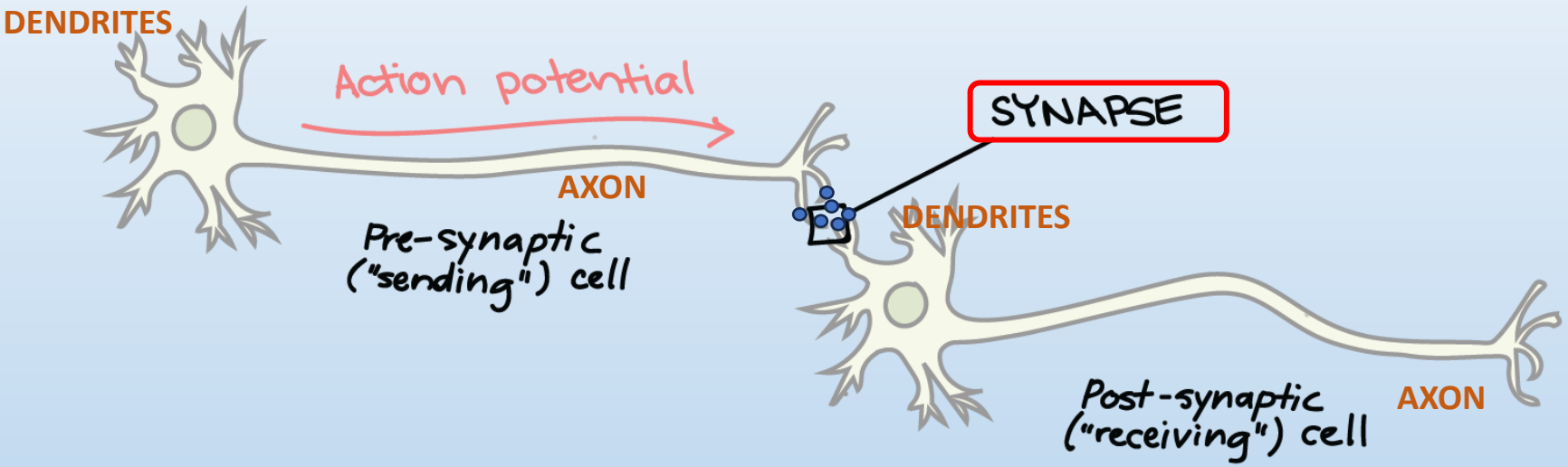
Susan cried as she recounted the incident to Michelle S. Bourgeois, a speech-pathology professor at Ohio State University who is an expert at communicating with people who have dementia.

That's when Bourgeois suggested that Susan create memory flashcards. "Your **mother** will never forget you," Bourgeois told her. "She just needs help remembering."

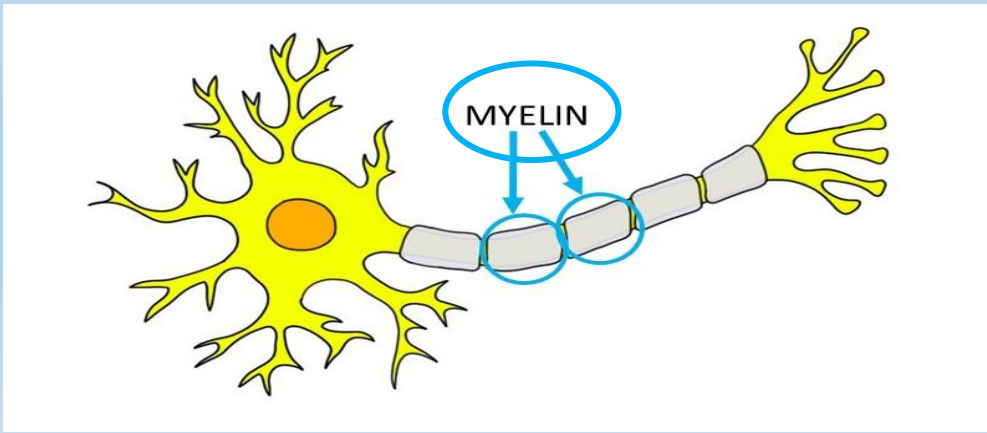
The next week at the nursing home, Susan said, "Mom, I have a **gift** for you" and gave her two photos. Under one she'd written, "This is my daughter Susan at age three"; under the other was "This is my daughter Susan now." Mary studied the photos, then looked at Susan and said, "As beautiful as ever."

# The Normal Brain

## Basics: Synapses

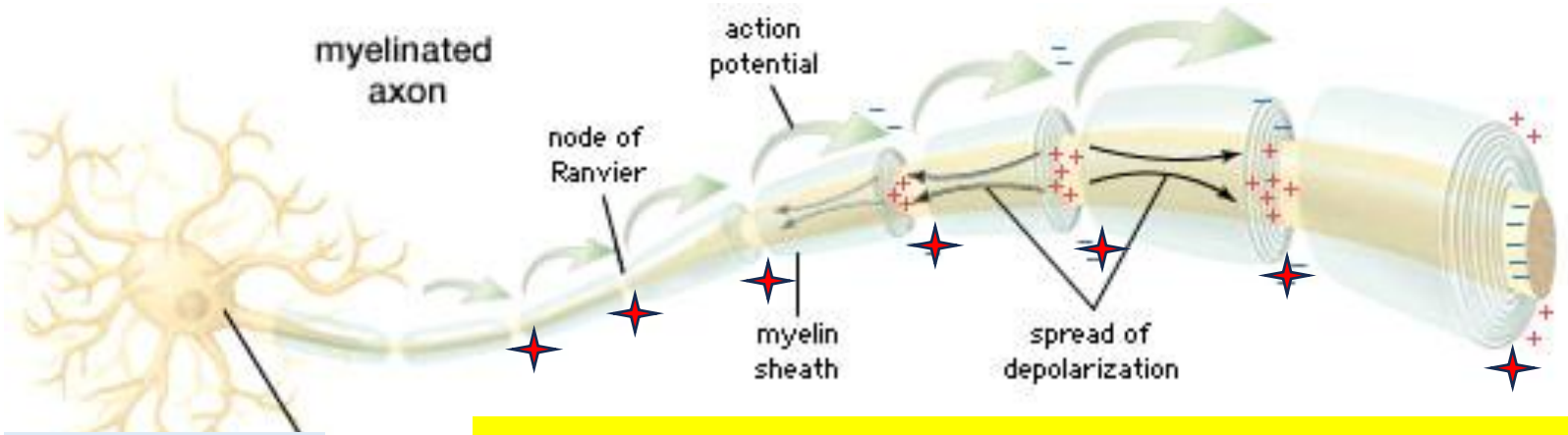




# Basics: Myelin

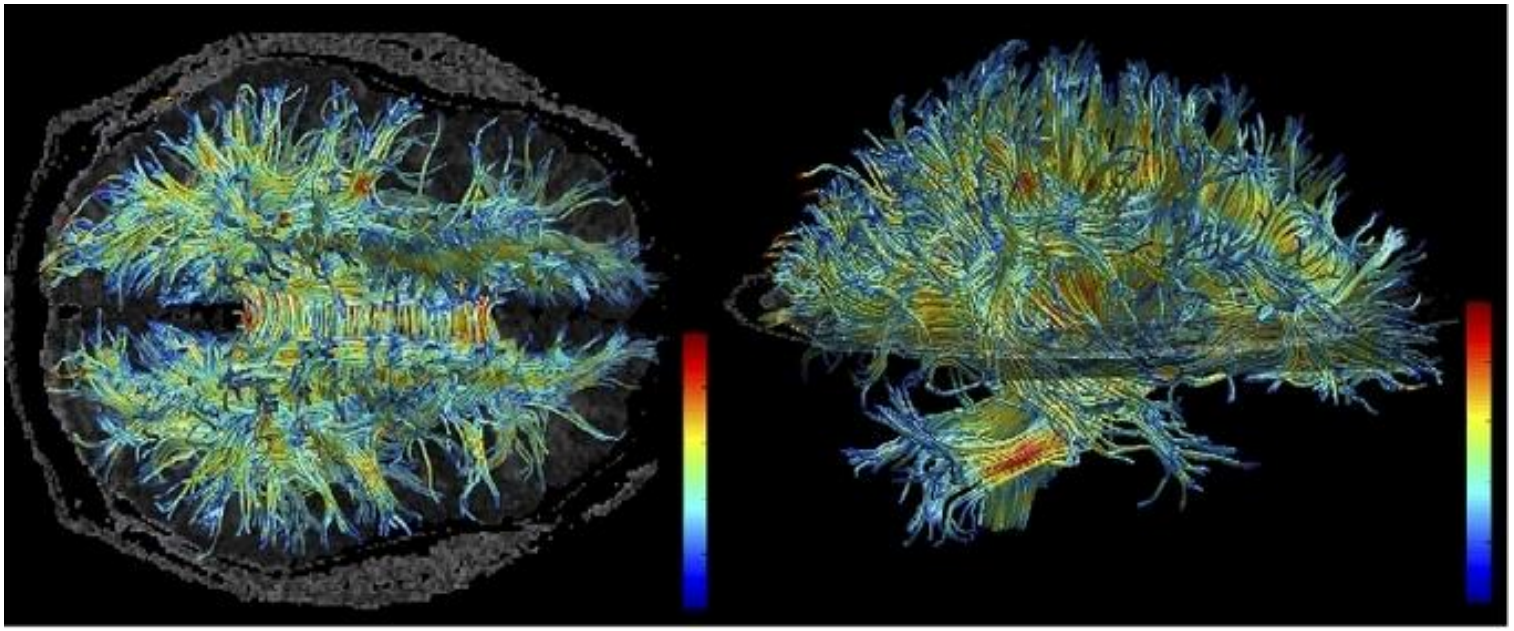

Before Myelination

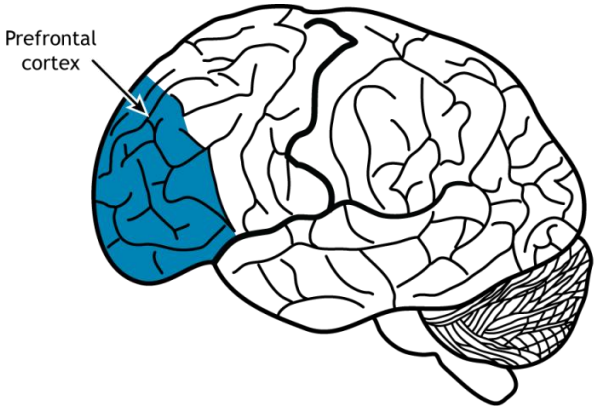



Myelinated

The travel of messages down myelinated axons may be 100 times faster than traveling down unmyelinated axons!

# Myelinated Neurons in the Adult Brain






The body starts making myelin before birth. The Prefrontal Lobes, our executive center, are the last to be myelinated, completed at around 25 years of age.

The Prefrontal Lobes are also the first to **lose** myelin in the process of aging.

# The ["normally"] Aging Brain

## Brain Slow-Down

- Growth of new synapses can continue. It occurs more slowly but increases with increased brain use.
- "Senescence reduces production of neurotransmitters --- [chemicals] that allow a nerve impulse to jump quickly" from nerve to nerve, as well as myelin decrease.
- Results in a brain slowdown, seen in reaction time, moving, & thinking.
- Brain slowdown correlates with slower walking and most other physical disabilities.
- Portions of brain shrink faster than others.

Berger, K.S. (2014) *Invitation to the life span*, 2e. pp.511-512 .

# GOOD NEWS

Using the brain –

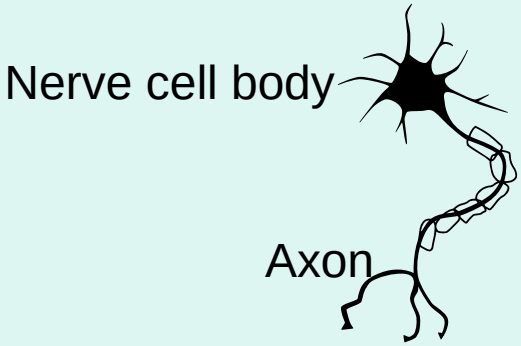
exercising body and mind –

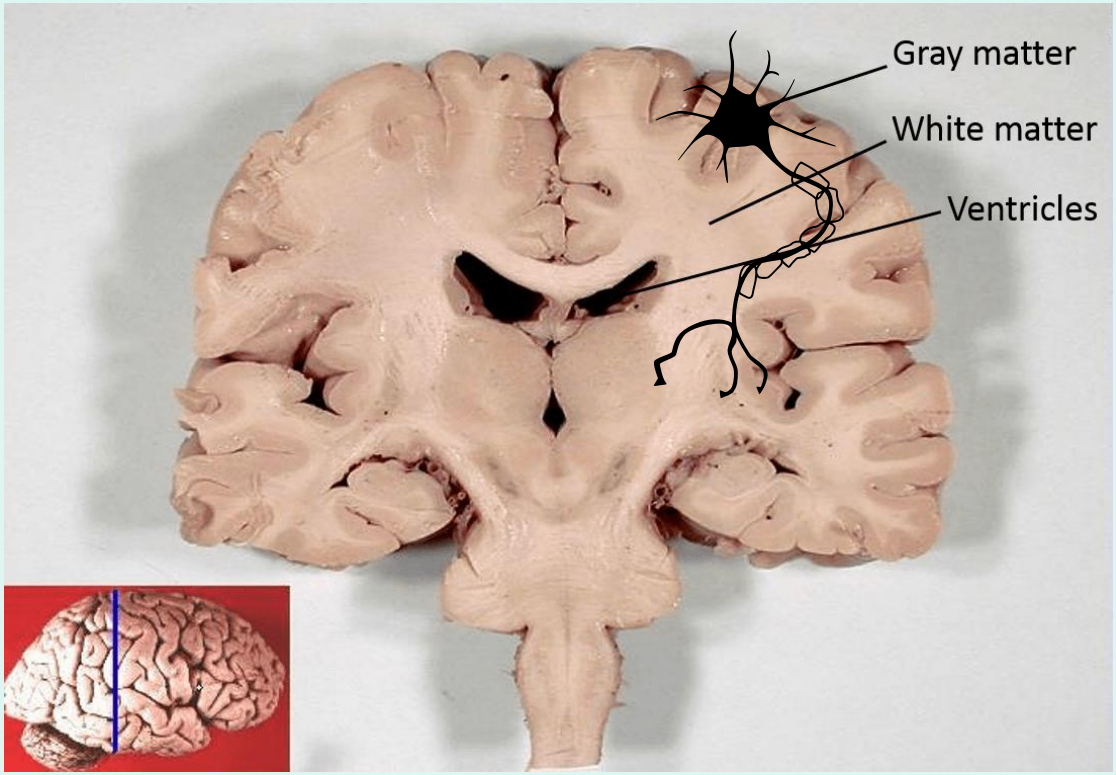
Increases Neuron Growth Factor

which

SLOWS THE SLOW-DOWN

# Evidence from Neuroscience

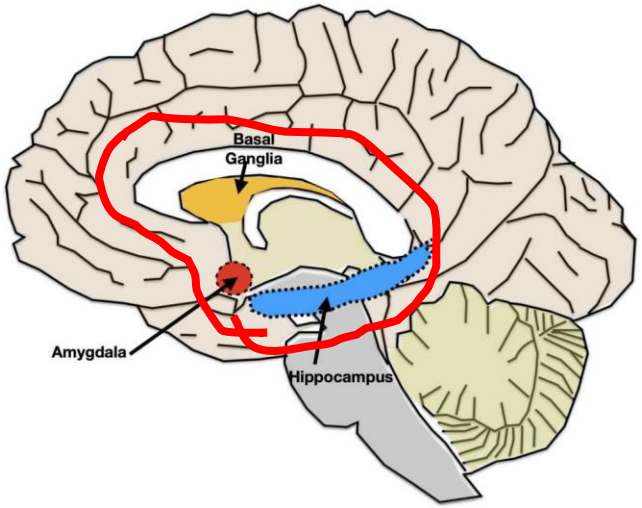


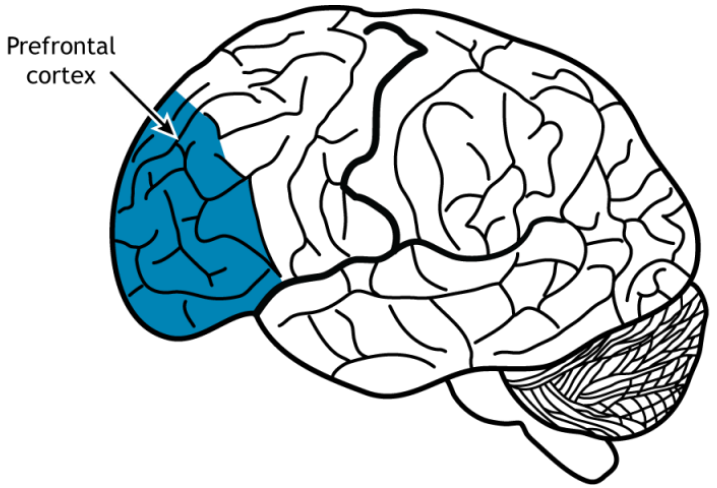




With age, all gray matter shrinks, but not all at the same rate. Some white matter (connections) increase.



Berger, K.S. (2014) *Invitation to the life span*, 2e. p.512




What ***shrinks*** fastest?

- HIPPOCAMPUS

- PREFRONTAL

What ***deteriorates*** first?

Memory

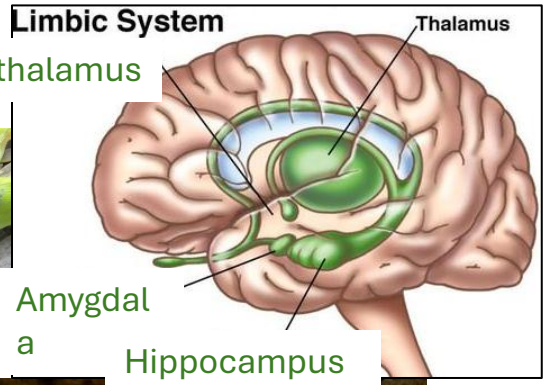
Planning, coordinating thoughts, **inhibiting unwanted responses**.

# What does the LIMBIC SYSTEM do?

The Limbic system is responsible for **emotions -** experiencing, interpreting & responding to them - and **learning.**

Identifies threats and initiates responses:

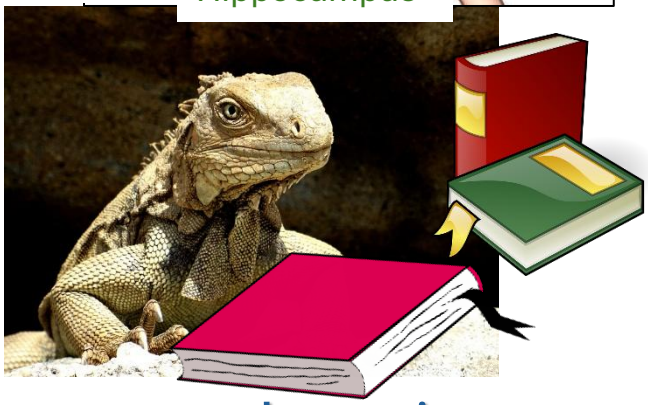
- Fear → fight, flight or freeze
- Sensory defensiveness




***AMYGDALA***

Emotional memory

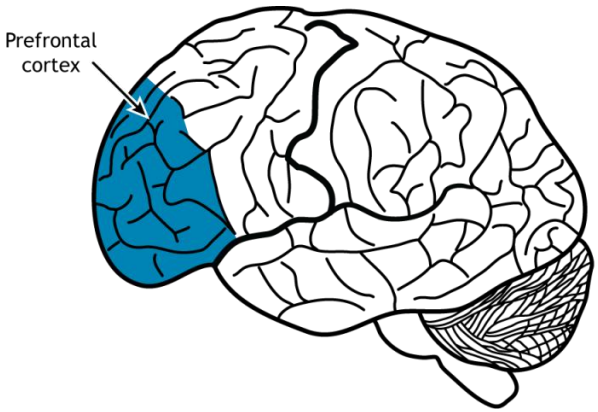
***HYPOTHALAMUS***
Hormonal and autonomic regulation



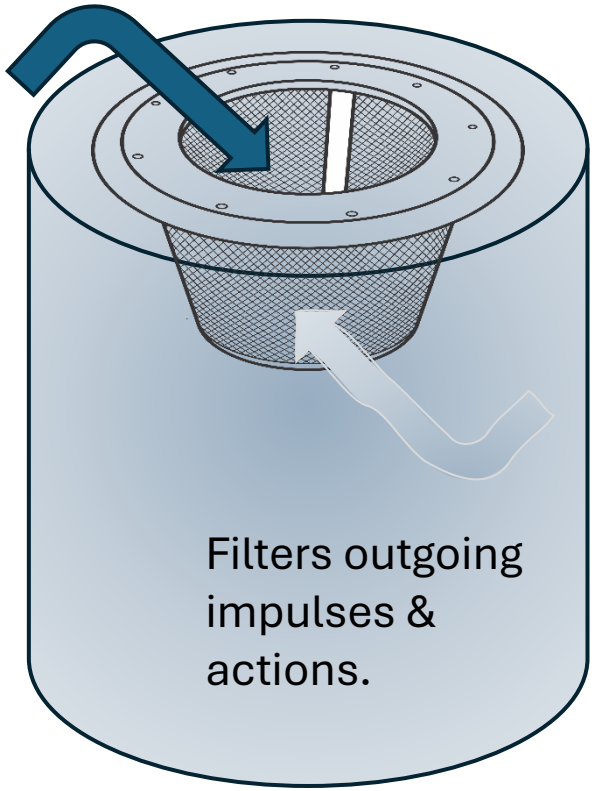
Learning

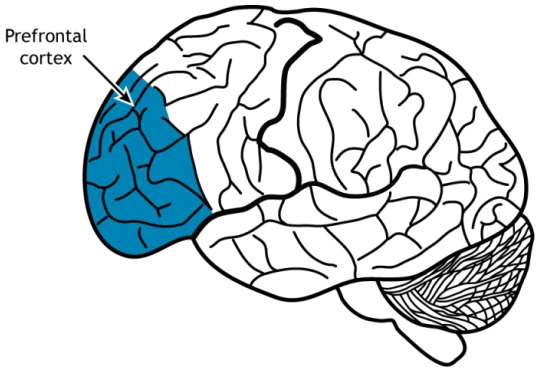
***HIPPOCAMPUS***

# What does the prefrontal brain do?

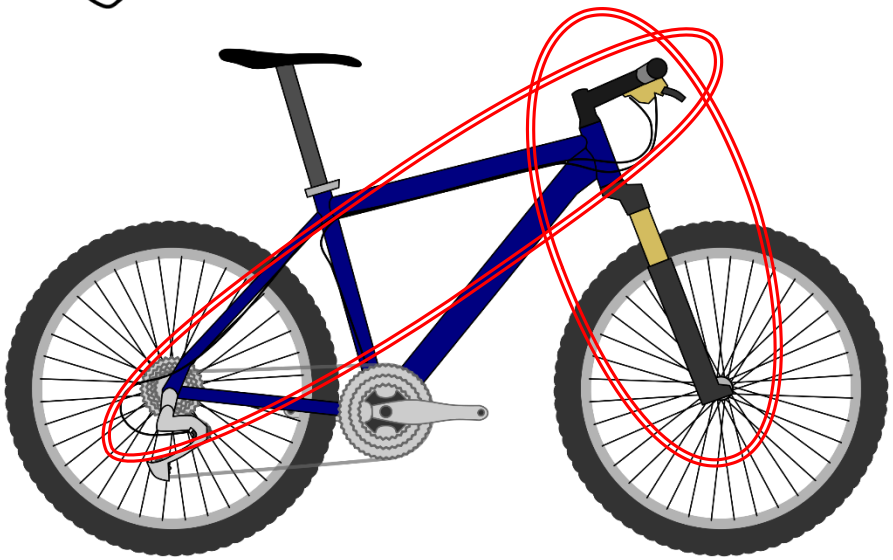



Filters incoming stimuli.
(Sensory Processing)





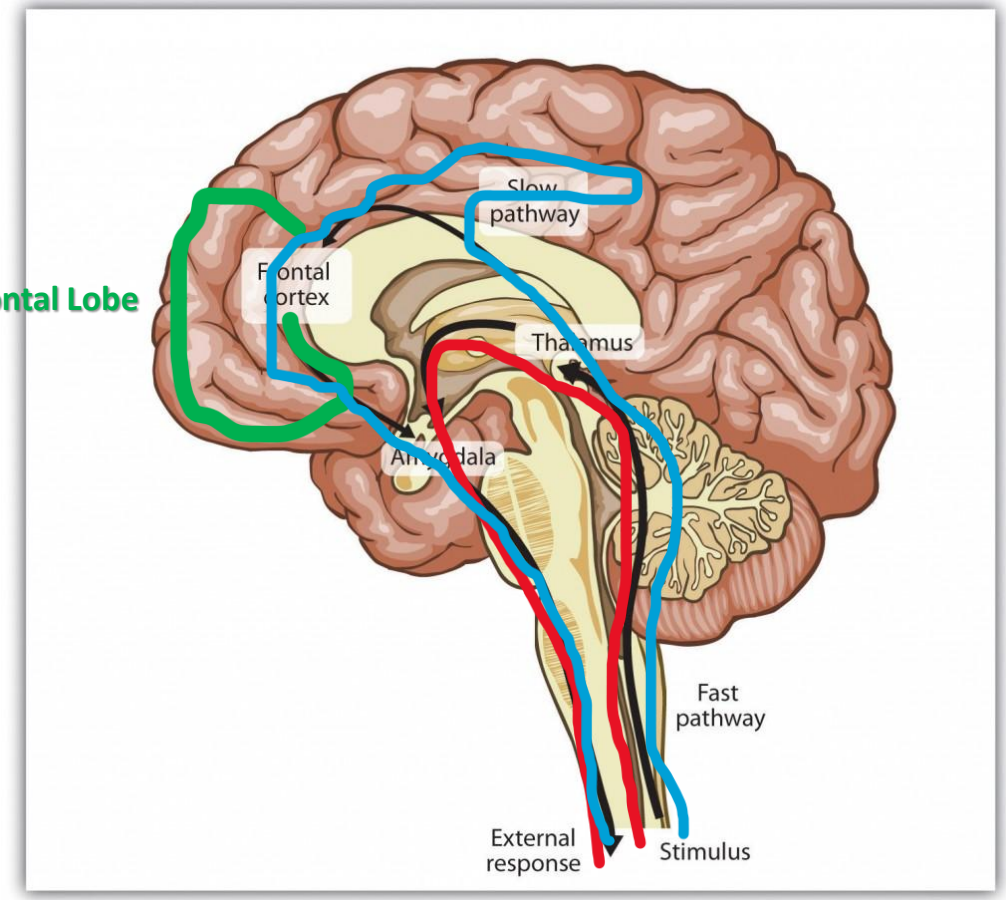

# What else does the prefrontal brain do?



It enables the thinking brain – the cortex – to be in charge,
like having good steering
and brakes on a bike.

# Limbic vs Prefrontal Responses

Pre-Frontal Lobe




- **Mature Prefrontal lobe (good brakes) enables controlled, thoughtful Cortical response**

- **Immature or deteriorating Prefrontal lobe (limited brakes & steering) results in "unsupervised" motor & emotional Limbic response.**

# Variation & Implications

## Rate of Brain Senescence Varies

- Brain senescence varies markedly from individual to individual.
- The suggested reasons include gender, education, experience, and elders' assessment of whether their everyday activities are restricted by their health.
- Complicated relationship of past education, current mental exercise, and intellectual functioning in late adulthood.
  - Schooling may slow the rate of brain shrinkage.
  - Good health may protect the brain more than education.
  - Education strengthens inhibition, the ability to say no or *keep quiet.* This ***may mask impairment*** when the prefrontal cortex shrinks.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 512.

# Elder Thinking Uses More Brain

Per PET scans & MRI studies,
older adults use more of their brains to solve problems.

*WHY? Possibly* due to:

- *Compensation:*
  - Using one brain region is inadequate for complex thinking, so older adults automatically use more parts.
  - Intellectual output may be unimpaired, even though the process of thinking has changed (but probably less efficient)
- *Reduced brain reserves*
  - Insufficient reserves may make challenging tasks too hard.
- *Wandering minds*
  - Brain stops using a focused region for each function, inhibition fails, attention wanders, and thinking becomes diffuse.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 512.

# Prefrontal Brain: Executive Function -- Control Processes

- **Prefrontal** directs planning, prioritization, selecting and integrating, retrieving, and analyzing,

  the "aim" of "Ready, Aim, Fire"

- As this deteriorates, more dependence on intuition and experience instead of analysis. More "Ready, Fire, Aim"
- Good analysis includes comparing present circumstance with past – impaired if problems with retrieval of long term memory.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p.515 .

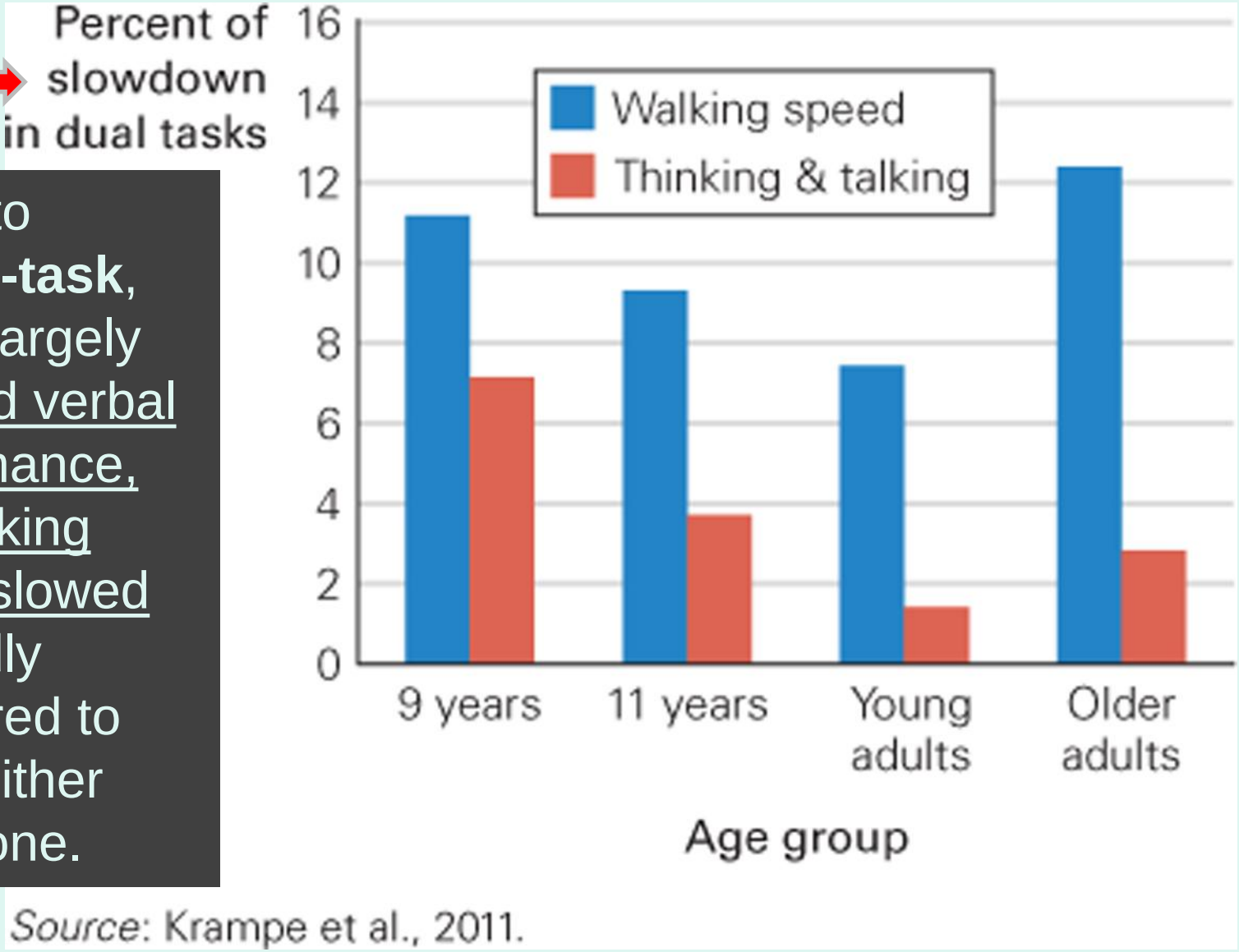
# Multitasking

- Older adults who were better at **working memory** and **multitasking** used their **prefrontal cortex.** Those who were worse did not.
- Multitasking slows down people of every age, but older adults more so. Especially hard to combine motor and cognitive tasks (as driving while talking.)
- Older adults usually need to concentrate on one task at a time.
- In study, nearly 1 SD improvement by elders using **problem-focused self-talk** while solving "Raven's Progressive Matrices"

Berger (2011). The Developing Person Through the Life Span, 8e. p 667-668.
Berger, K.S. (2014) *Invitation to the life span*, 2e. p.512.

# EXTENT OF **SLOWING** from Just Walking or Just Naming things in a category, like spices, to Walking AND Naming

Trying to **double-task**, elders largely retained verbal performance, but walking speed slowed markedly compared to doing either task alone.




*Source*: Krampe et al., 2011.

**Figure 14.3 One Task at a Time.** Kathleen Stassen Berger: *Invitation to* The Life Span, Second Edition

# Memory - Hippocampus

Source Amnesia –

Inability to remember (or initial inattention to) whether information is from a reliable source makes one more vulnerable to scams, misleading ads and rumors.

Older individuals take longer to perceive and process sensations.

Working Memory shrinks due to prefrontal & hippocampal slowdown. Reduced working memory inhibits multitasking.

- When older people can take their time and concentrate, their working memory seems as good as ever.
- Required concentration may crowd out other mental tasks that a younger person could do simultaneously.

Recall Memory is much harder than Recognition Memory.

Emotional memory more persistent.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p.513-514 .

# Memory

Fear of memory loss

→ anxiety → poorer memory. More problem in well educated.

*With aging*

Receptive vocabulary increases - recognizing word meaning.

Remembering names tends to be a problem independent of other problems of cognitive aging:

it slows, & may decrease. → anxiety → name block.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p.513 .

## Creating new long term memories gets harder:

- With shrinking hippocampus, *harder to get new information into long term storage*. Still improved by high emotional state.
- Much worse if have experienced brain hypoxia.

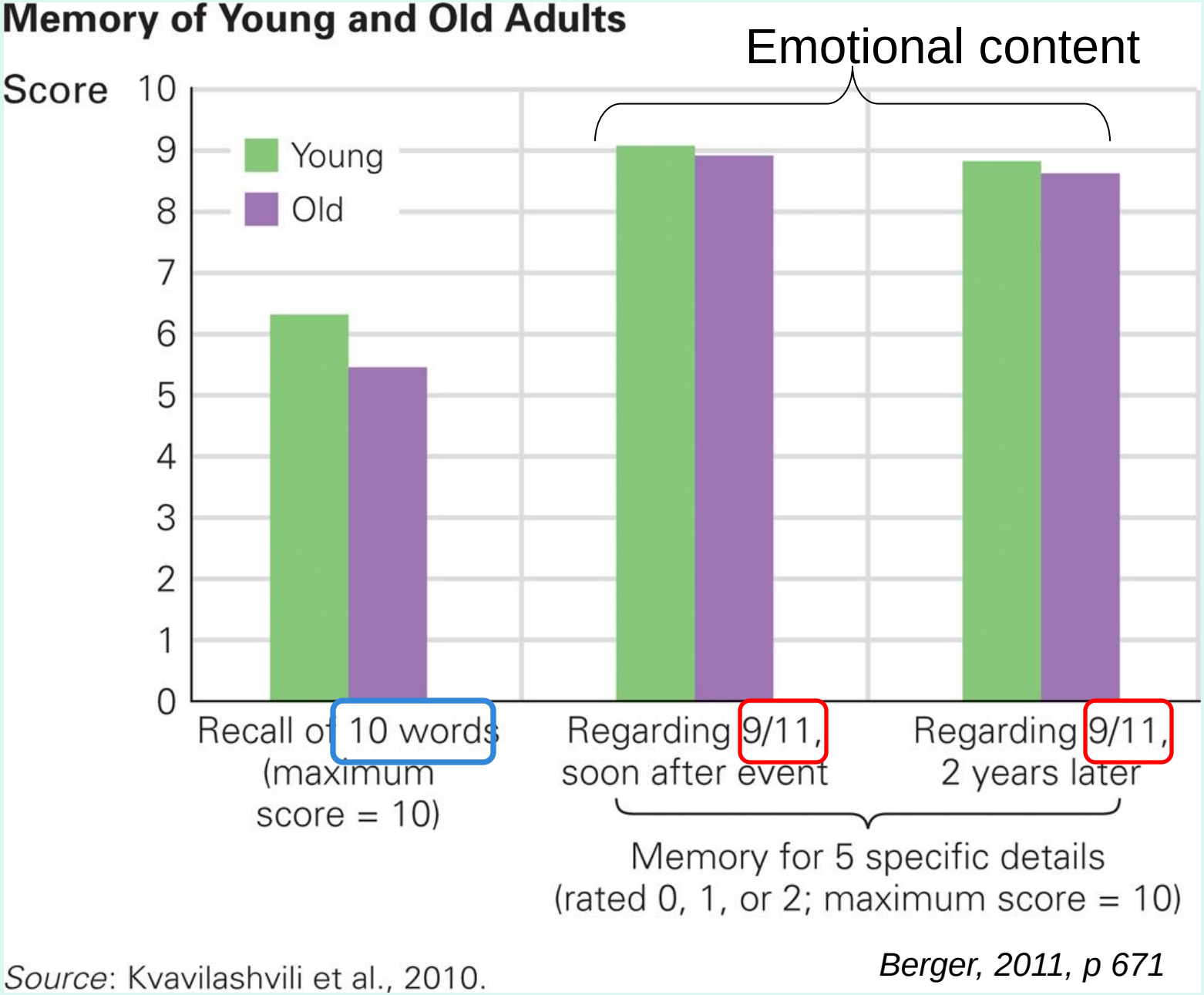
D. Johnson, 11/2014

# Memory

- Accessing Long-Term Memory
  - It is difficult to get an accurate assessment of long-term memory.
  - Emotional memories encoded at one point in life tend to endure, without much loss or distortion.
  - At every age, recognition memory *(as multiple choice)* is better than recall *(fill in the blank)*.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 515.

# Long-Term Memory –*of what?*




*Berger, 2011, p 671*

# Reminding People of What They Know

**Priming:** A strategy where words or ideas are presented in order to make it easier (or not) to remember something, such as:

- Saying words that provide expectation or context:
  - "smart" → performance **improves d/t pos. expectation**
  - "senile" → performance **poorer d/t neg. expectation (stereotype threat)**
  - "What was the bird that surprised us over coffee this morning?
- When trying to remember whether they had actually experienced or had just previously imagined doing something, asking subjects to **think of the *sensations*** experienced improved accuracy in seniors but not in younger subjects.


Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 515.

# Control Strategies to Improve Retrieval

Some helpful strategies:

- Using notes – including learning use of cell phone note-pad & calendar
- Intentionally making mental recall tabs or associations
- **P**am **B**rown & her husband **J**ohn = PBJ

With proper strategies, cognition in late adulthood can be good. **BUT**

Anxiety, fear, depression (& sleep deprivation) impair strategy use, cognition and learning potential - & are increased by STEREOTYPE THREAT.

# Cognitive Output

- It is normal to experience gradual decline in output of primary mental abilities (e.g., verbal meaning, spatial orientation, inductive reasoning, number ability, word fluency).

- Two important modifiers are health and training

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 516.

# Cognitive Output
# Health and Well-Being

- Cognitive level is negatively correlated with Morbidity and Disability, & positively correlated with Vitality.
  - **Morbidity –** disease
  - **Disability -** long-term difficulty in *performing normal** activities of daily life because of some physical, mental, or emotional condition
  - **Vitality -** how healthy and energetic - physically, intellectually, and socially - an individual actually feels

These are better predictors of cognition than years of age.

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 516-517.

# Training

- Another important modifier of cognitive decline.
- Studies show that training can improve any cognitive ability, even for the very old, but more repetition is required to maintain the benefit
- Training in one task can improve *related* tasks.

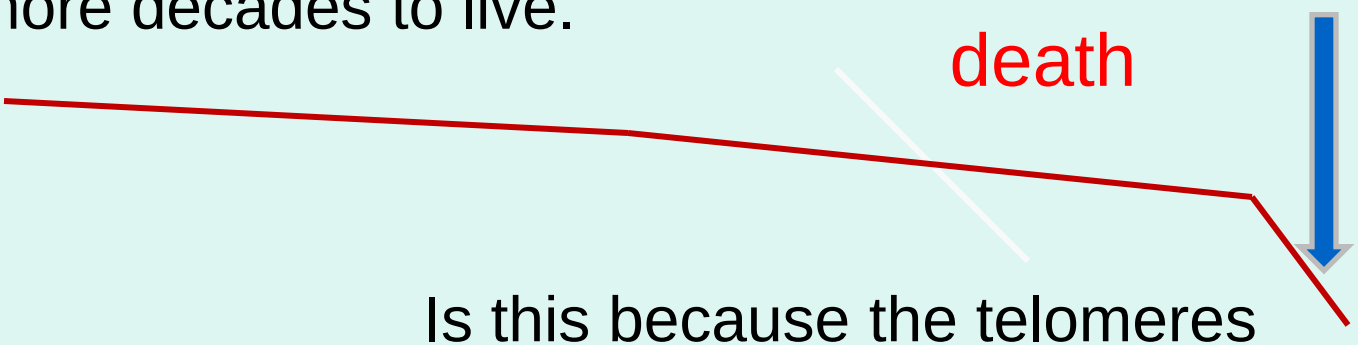
Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 516 - 517.

# Cognitive Decline

## Terminal decline

– A steep overall slowdown of cognitive abilities in the weeks and months before death

Very slow decline is experienced when one has more decades to live.



Is this because the telomeres are reaching their ends?

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 516-517.

# INTERFERENCE with BRAIN FUNCTION

## Sensory Input Problems

Senescence (aging) is pervasive & inevitable.

Obvious in appearance (skin gets wrinkled, bodies change shape) and the senses.

### Sensory input is usually altered:

- Only 10% of people over age 65 see well without glasses.
- Taste, smell, touch, and hearing are also impaired (e.g., by age 90, the average man is almost deaf, as are about half of the women).

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 513.

# Poor Sensory Input Interferes with Brain Function

Some information never reaches sensory memory in older people because the senses never detect the stimuli. Increasing problem with age.

- 31% of age differences in **aptitude scores** could be due to disparate sensory function (e.g. not hearing or seeing everything presented)
- Problems of **social perception**:
  1. not following where other person looking,
  2. not seeing subtle facial expressions,
  3. not deciphering emotional content of speech

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 513.

# Auditory Problems

Auditory problems – most commonly high tone loss +/- tinnitus (constant ringing in the ears):

- Small and sensitive hearing aids are available but many people still hesitate to get aids.
- Missing out on bits of conversation cuts down on communication → many other social losses.
- Younger people tend to yell or use elder-speak, both of which are demeaning.

- "Hard-of-hearing individuals are often mistakenly thought to be retarded or mentally ill…[and] are more subject to depression, demoralization, and even at times psychotic symptomatology" (Butler et al., 1998, p. 181).

# Interference by needing to fill in for missed sensory information

- The brain automatically fills in missed sights and sounds, but that requires time & mental work.
- Vital information may be distorted or lost without the person realizing it, resulting in misunderstanding, errors and confusion.
- It's a major block to efficient and effective thought in the elderly, especially problematic if many sensations occur quickly.

CONSISTENT USE OF HEARING AIDS & GLASSES
as prescribed
empowers the brain!

Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 513.

# Chance of Visual Impairment Increases with Age

| Eye Condition | Progressive Increase with Age | | |
|---|---|---|---|
| | 40-50 yrs | 60-70 yrs | 80-90 yrs |
| Cataracts | 10% at 50 yrs | 30% at 70 years | |
| Glaucoma | In African-Americans & diabetics may start in 40's | 1% in 70's | 10% in 90's |
| Macular Degeneration | | 4% in 60's | 12% over 80 |

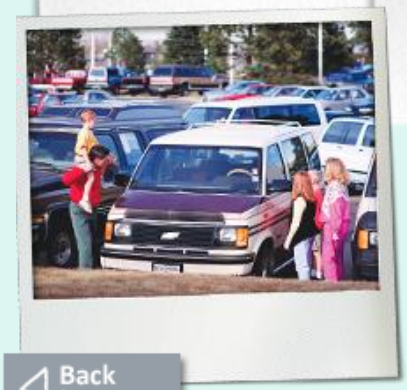
From Berger 2014, p 510

# 25

# SENESCENCE
## Dulling of the Senses

What are **common vision impairments** among the elderly?

### Normal



### Cataracts

a thickening of the lens, causing vision to become cloudy, opaque, and distorted

can be removed in outpatient surgery and replaced with an artificial lens

### Glaucoma

a buildup of fluid within the eye that damages the optic nerve

early stages have no symptoms, but later stages cause blindness that can be prevented if condition is diagnosed and treated early enough

### Macular degeneration

a deterioration of the retina

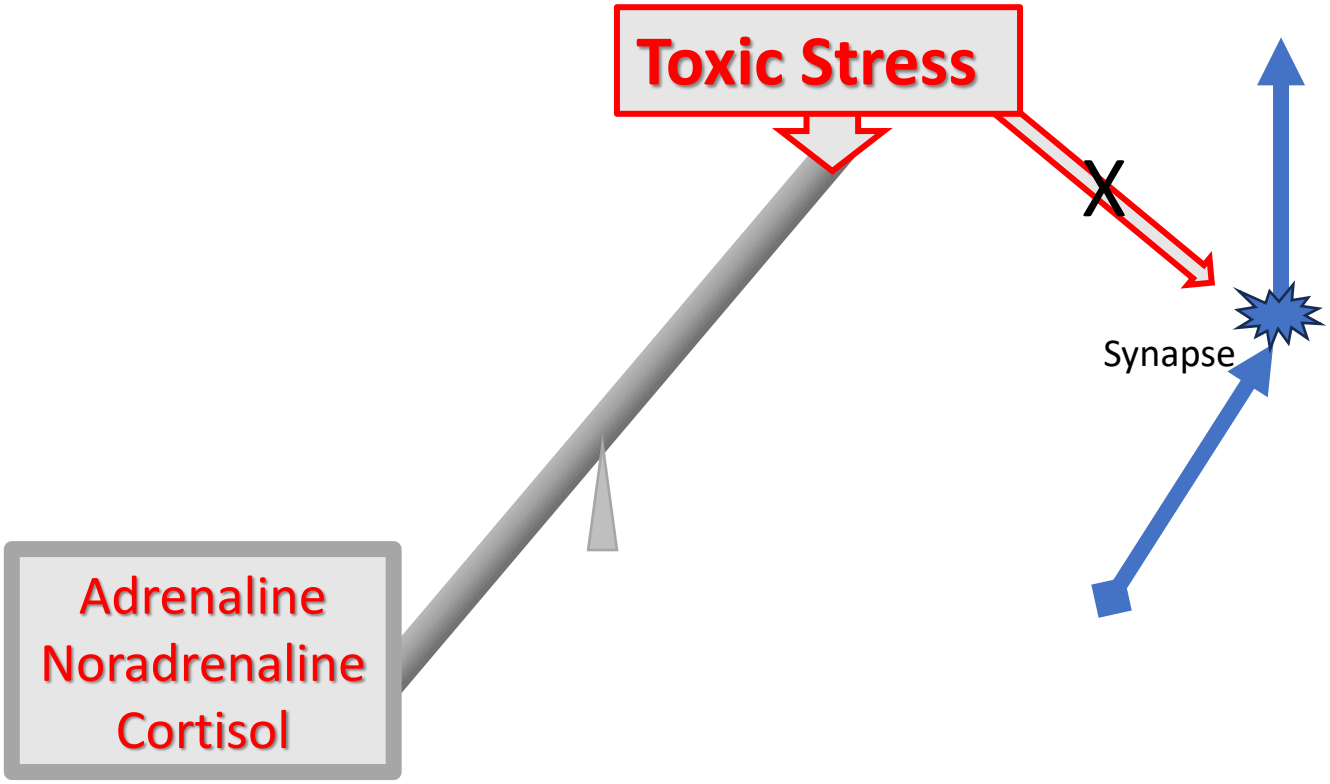
early warning is vision that becomes spotty (e.g., some letters missing when reading)

early treatment (medication) can restore some vision, but this condition is progressive and causes blindness about five years after it starts

Back to menu

# TOXIC STRESS

Toxic Stress raises
adrenaline, noradrenaline and cortisol.
**Synapses wither and learning is decreased.**




Decreases Learning

Toxic Stress compromises brain function.

How do we – and could we - support one another ?

# Stereotype: Ageism "too old to ---"

## The Elderly's View of Ageism matters

- Ageism becomes a self-fulfilling prophecy.
- Stereotype threat can be as debilitating for the aged as for other groups.
- AGEISM CONTRIBUTES TO INACTIVITY AS ELDERS BELIEVE THEY ARE TOO OLD FOR ACTION.
- Elderly people are less vulnerable to stereotype threat if they have positive interactions with younger generations

# AGEISM LEADS TO ILLNESS

"The elderly themselves exercise less, and their inaction:

- increases stiffness*;
- reduces range of motion; and
- slows down circulation, digestion, the brain, and so on.
- Balance is diminished, necessitating a slower gait and perhaps a walker or cane (Newell et al., 2006)."

**movement softens cartilage, decreasing stiffness*

# BOOSTERS OF BRAIN FUNCTION

- **Movement**
- **Compensate for Sensory Loss**
- **Positivity effect**
- **Compression of Morbidity**
- **Selective Optimization with Compensation**

Berger, K.S., 2014. Invitation to the life span, 2e. P 538-539

# "Health is protected by an hour of movement a day"

- "--the elder who does not move is at higher risk of virtually every illness, symptom, and sign of aging".

**Stereotype threat endangers health by decreasing movement.**

A nonstop mover – Mom shortly before her first stroke, around 95 years, when she went from young-old to old-old.

# Helping the Senses

Technology can compensate
for almost all sensory losses.

With poor vision or hearing, it is critical to:

Recognize and compensate rather than
Denying or passively accepting

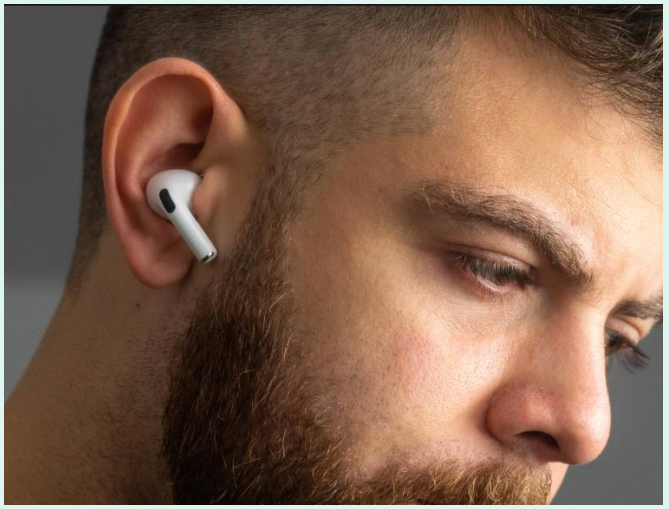
Especially issue in hearing loss, as

- Loss of hearing is gradual
- Easier to blame others for not talking clearly
- Ageism stereotype related to hearing aids.

# Hearing Aids too Expensive?

IF you use an Apple tablet or phone,
for less than $200 you can get high quality
conversational sound and join the “in crowd”.



Apple AirPods Pro 2 Wireless Earbuds, Active Noise Cancellation, Hearing Aid Feature, Bluetooth Headphones, Transparency, Personalized Spatial Audio, High-Fidelity Sound, H2 Chip, USB-C Charging

# Helping Vision

Intervention for visual problems:

- Brighter lights and bifocals or two pairs of glasses are needed as become FAR SIGHTED (can't focus near)
- Cataracts can be removed, replaced with better lenses
- If diagnosed early
  - Glaucoma-caused damage can be avoided
  - Macular degeneration progress can be slowed

Elaborate visual aids allow independence even if legally blind:

- canes that sense when an object is near,
- infrared lenses,
- service animals,
- computers that "speak" written words

# Positivity Effect

- **Positivity effect -** The tendency for elderly people to "perceive, prefer, and remember positive images and experiences more than negative ones". Associated with belief "that life is meaningful".
  - Selective memory is a way to compensate for whatever troubles occur.
  - Unpleasant experiences are reinterpreted as inconsequential.

Berger, K.S., 2014. Invitation to the life span, 2e. P 538-539

# Positivity Effect (cont.)

- Less likely to remember (or recognize) unpleasant encounters, and if do recognize, primary goal is to "keep the peace" and compromise, thereby experiencing far less distress than if try to change the other person's opinion
- Neuroticism decreases, except regarding loss of physical & mental talent
  - Note: "fearful and asocial people became less happy and more likely to die"

Berger, K.S., 2014. Invitation to the life span, 2e. P 538-539

- **Self-perception** normally **tilts toward integrity** rather than despair.
  - In cognitive and social aspects, seek to achieve harmony.
  - **Self-acceptance leads to happiness.**
- Research on what people hope for themselves (the **ideal** self) and how they perceive themselves (the **real** self) finds that, **with age, the two selves come closer together**.
- Negative event in healthy elderly → less anger, disappointment & sadness evident in brain, heart rate & narrative; more "let it go" & "let's move on".

Berger, K.S., 2014. Invitation to the life span, 2e. P 538-539

# Selective Optimization with Compensation

"Both primary and secondary aging undermine quality of life."

"However, if people respond with ***selective optimization with compensation*** --, they

- Select: choose projects and activities
- Optimize: that they can do well, thus
- Compensate: adjusting to disease, avoiding disability and maintaining vitality."

Set goals, assess abilities, figure how to accomplish

Men tend to be focused on finances and doing things, women on friendships and spiritual lives

Berger, The Developing Person Through the Life Span, 8e. p 648. 

# Driving - Individual Compensation by older adults:

- Drivers >65 years old:
  - Drive slower, avoid night & bad weather driving, use familiar routes,
  - Drive less, avoid freeway-& may quit ---
  - SO: ACCIDENT RATE *PER DRIVER is* LOWER
  - But accident rate per mile driven is higher if >65 yrs.
- Compensation in laws & environment NEEDED:
  - More frequent testing for license incl. peripheral vision,
  - larger signs, mirrors at corners, better lighting, non-glare headlights, & warnings for ice, fog, flood
  - [newer cars have lane-change cars moving alerts, adaptive cruise control and emergency automatic braking]

Berger, The Developing Person Through the Life Span, 8e. pp 649-650. 

# Progressive Rise from 65-85 years in Accidents per Million Miles Driven, from < 5 to > 15

- Questions for the older driver:
  1. Is your vision fading?
  2. Do your medications* affect your alertness
  3. Do your physical limitations affect neck-turning, foot-pushing, wheel-turning?
  4. Do you get lost more easily now than in earlier years?
  5. Do other drivers honk at you?
  6. Have you had any minor accidents?
- If you answer “no”, check with someone else who will be honest with you.

About potentially sedating medications:

What time to you take the medications?

[Usually need equal hours between equal doses]

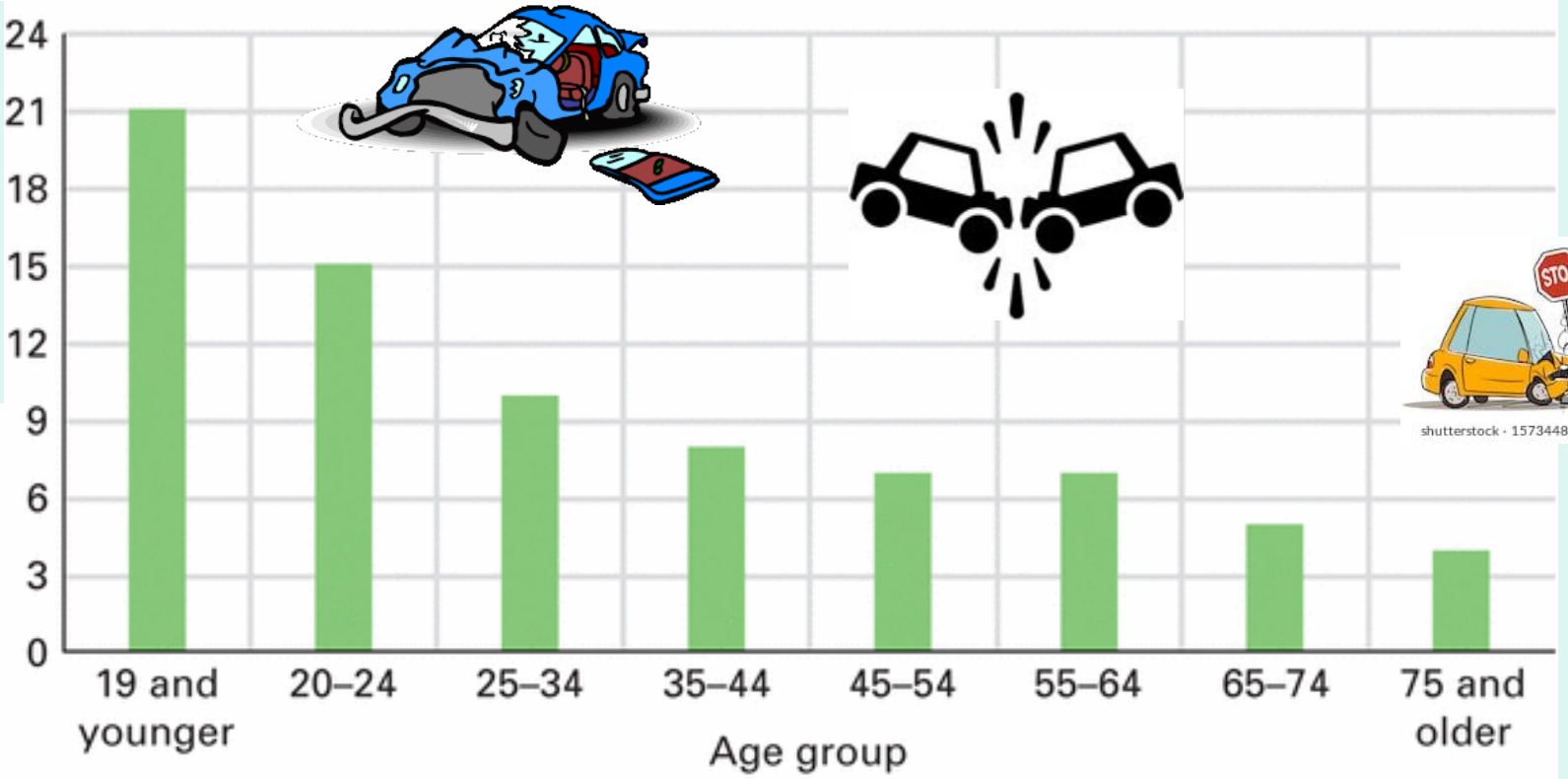
How to you keep track of your doses?

Dr. J, 2014, and Berger, K.S. (2014) *Invitation to the life span*, 2e. p. 509.

FIGURE 23.4

## Annual Motor-Vehicle Accident Rate by Age Group, United States, 2007

Annual accidents per 100 licensed drivers in age group











*Source*: National Safety Council, 2010.

Figure 23.4 **Too Slow?** Teenage drivers are impatient with older drivers, yet the data suggest that driving more slowly also means driving more safely. In their defense, the accident rate of the youngest—five times that of the oldest—includes all accidents, even those caused by unlicensed drivers.

Berger, The Developing Person Through the Life Span, 8e. p 649. 

# Selective Compensation & Optimization to Decrease Falls:

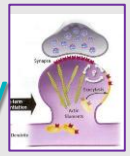
- Weight training and walking to
  - increase muscle tone & stability,
  - strengthen bones &
  - increase cardiovascular health
- Recognize low risk of elderly victimization & greater risk of inactivity than of falling
- Address fear of falling with appropriate shoes/equipment, mindful movement, +/- a walking partner or group

# Selective Optimization for Sleep

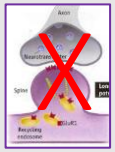
- Sleep in older adults
  - Spend more time in bed, take longer to fall asleep, wake up much more often, and feel drowsy in the daytime more often.
  - *Inadequate sleep compromises memory, performance & quality of life.*
- *Sleep problem may be aggravated by **sleep apnea, smoking, alcohol, caffeine & chocolate***
- Individual Compensation:
  - *Avoid aggravators*
  - *Don't stay in bed when can't sleep.*
  - *Don't worry about early or frequent awakening.*

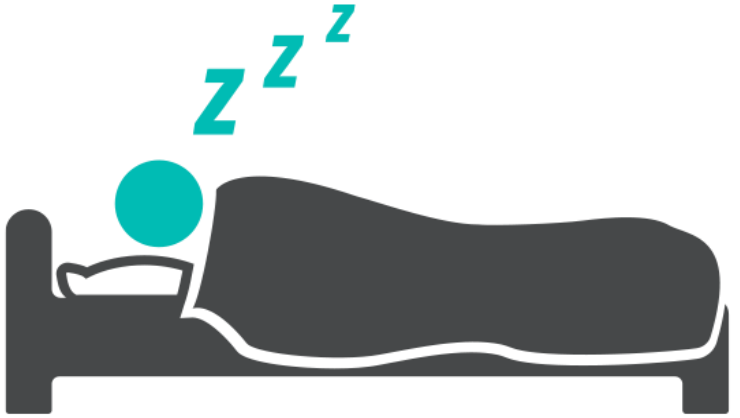
# We need sleep because, during sleep, the brain is busy:

- Strengthening synapses for memory 
- Integrating new information with stored information/memories 

- Rebuilding energy stores 

- Getting rid of weak synapses 
- Clearing metabolic junk 

| | | |
|---|---|---|
| Preschool | 3–5 years | 10–13 hours per 24 hours (including naps)* |
| School Age | 6–12 years | 9–12 hours per 24 hours* |
| Teen | 13–18 years | 8–10 hours per 24 hours* |
| Adult | >18 years | 7-9 hours per 24 hours |



*https://www.cdc.gov/sleep/about_sleep/how_much_sleep.htm

# Sleep Hygiene:

## Light interferes with sleep

- Dark quiet room
- Avoid screens the hour before bed

## Stimulants keep one awake


## Alcohol awakens one later

## Keep the same schedule

Don't change more than an hour on weekends.

- It's easy to stay up later and get up later.
- It's hard to fall asleep earlier and get up earlier.

For **teens,** it's not all their fault: Teens' bodies are **programmed** to **stay up later** and **get up later.** Is first period too early for 8th graders?

*Note: Try to limit naps to 15-20 minutes. If awake at night, OK to read from print on paper, but avoid reading from a screen.*

# Optimizing an Integrated Sense of Self

## Piaget

**Equilibrium**

**→New idea or experience (aging)**

**→Disequilibrium**

**→ Adaptation via**

**Assimilation**

(I'm the same. Capable)

**Unsafe?**

**Accommodation**

(I'm aged Incapable)

**Depressed?**

**New Equilibrium**

**or**

## Dialectical

THESIS
I'm the same, Capable

ANTITHESIS
I'm aged, incapable

SYNTHESIS
I'm me and capable of adapting to the limitations of aging & enjoying the opportunities

*Selective Optimization with Compensation*

*DDJ*

# The Best of Times: New Cognitive Development

Erik Ericson wrote the book, *Vital Involvement in Old Age*, in 1986, when he was in his 90's ☺ He refers to old age as a time of opportunity for "the re-synthesis of all the resilience and strengths already developed" (Erikson et al., 1986, p 40.)

Creating for Posterity late in life

- Grandma Moses – oil paintings 75 -101
- Michelangelo – frescoes in Sistine Chapel at 75
- Verdi – opera Falstaff at 80
- Frank Lloyd Wright – Guggenheim Museum at 91

Berger, K.S. (2014) *Invitation to the life span*, 2e. p.527 .

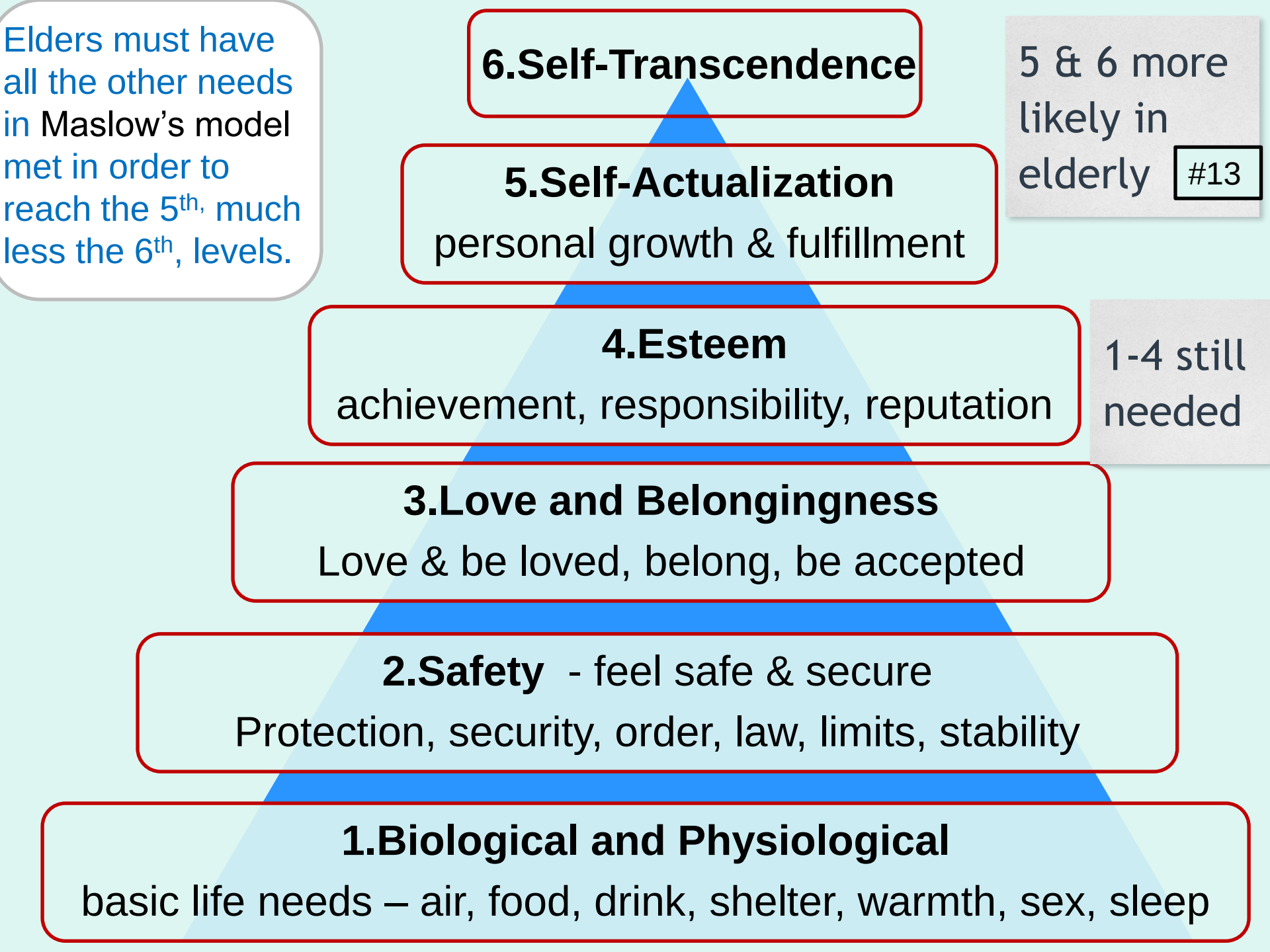
# The Pinnacle of Old Age in models of human development

- *Integrity vs. despair*
  - Is the final stage in Erikson's model. With integrity, older people expand their interest in the arts, in children, and in human experience as a whole.

- *Self-Actualization* and *Transcendence*

-Are the last two levels in Maslow's hierarchy of needs.

. Self-actualization is "characterized by aesthetic, creative, philosophical, and spiritual understanding." These are reached only if other needs are met.


Elders must have all the other needs in Maslow's model met in order to reach the 5th, much less the 6th, levels.
6.Self-Transcendence
5 & 6 more likely in elderly
#13
5.Self-Actualization
personal growth & fulfillment
4.Esteem
achievement, responsibility, reputation
1-4 still needed
3.Love and Belongingness
Love & be loved, belong, be accepted
2.Safety - feel safe & secure
Protection, security, order, law, limits, stability
1.Biological and Physiological
basic life needs – air, food, drink, shelter, warmth, sex, sleep

# Wisdom

- Wisdom is “An expert knowledge system dealing with the conduct and understanding of life.” (Baltes & Smith).
  - More selfless but understanding of self.
  - Invested in others and the greater good
- Some (not all) elderly people are unusually wise.
- Wisdom is most likely in individuals who are open, generative, structured, cognitively integrative, enriched by good mentors and *expanded and cautioned by experience*

Berger, The Developing Person Through the Life Span, 8e. p 688-689. 

Berger, K.S. (2014) *Invitation to the life span*, 2e. p.528-529 .

# Projects of Passion & Legacy

## Life Review

- An examination of one's own part in life, which often takes the form of stories written or spoken by elderly people who want to share them with younger ones.
- Good for mental health at any age

## Art, photography, blogs, publishing

## Commitment to meaningful projects and purposes

## Mentoring, child-sitting, coaching, cooking, caring

Berger (2011).*The developing person through the life span*, 8e. Pp 686-688
Berger, K.S. (2014) *Invitation to the life span*, 2e. p.527-528 .

# Here's CHEERS for your every day best!

*Young Green Herron, Sweetwater Wetlands*

*H Johnson, Mtlemmonazimages.com*


Dorothy Johnson, MD, FAAP

The Center for Neurosciences Foundation


where

EACH BRAIN MATTERS

EACH BRAIN MATTERS

THE CENTER FOR NEUROSCIENCES FOUNDATION