

MS Ireland Conference - Cork 2016
Say Hello to Brain Health
Prof. Sabina Brennan



Say Hello To Brain Health



Sabina Brennan (PhD)

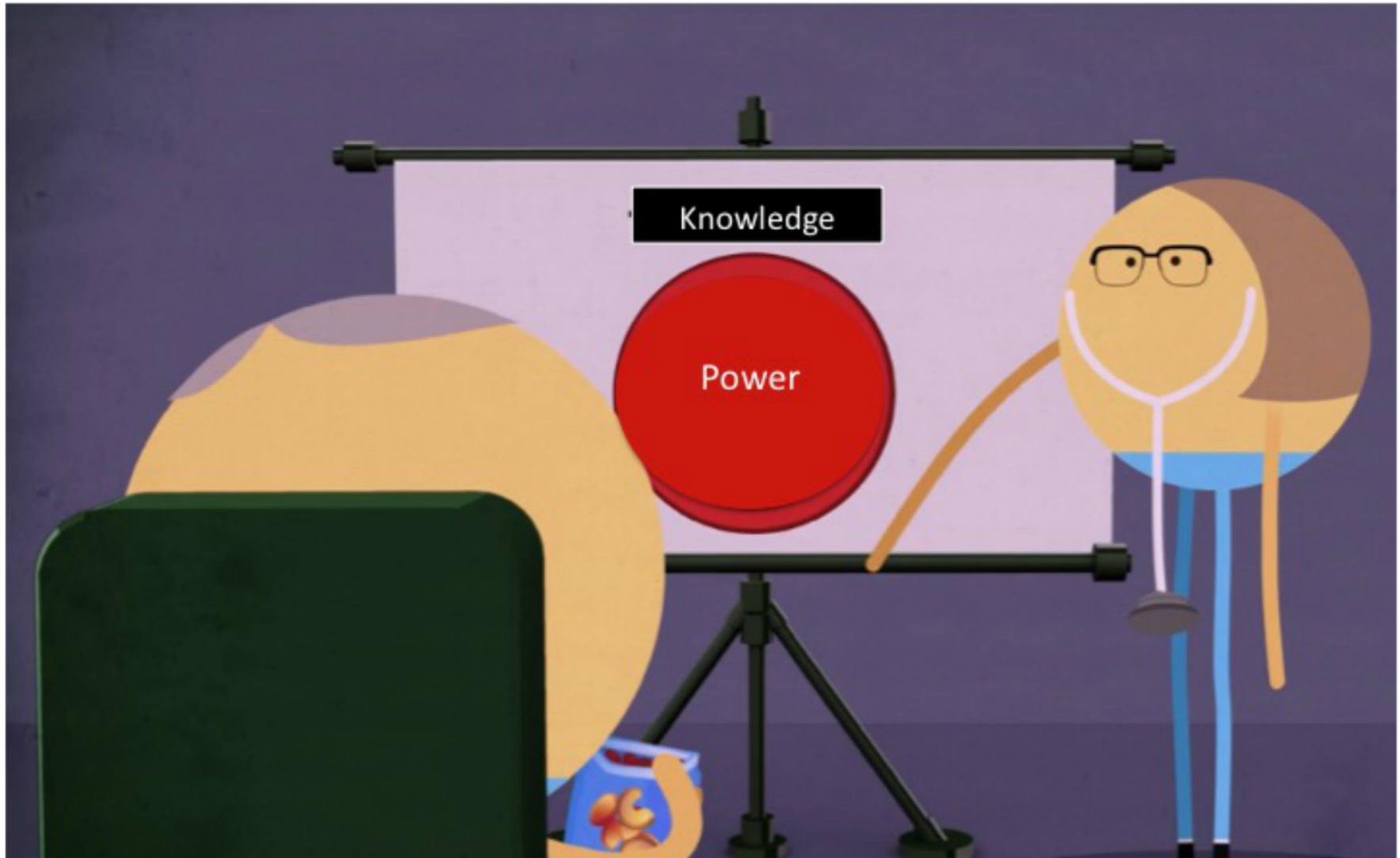


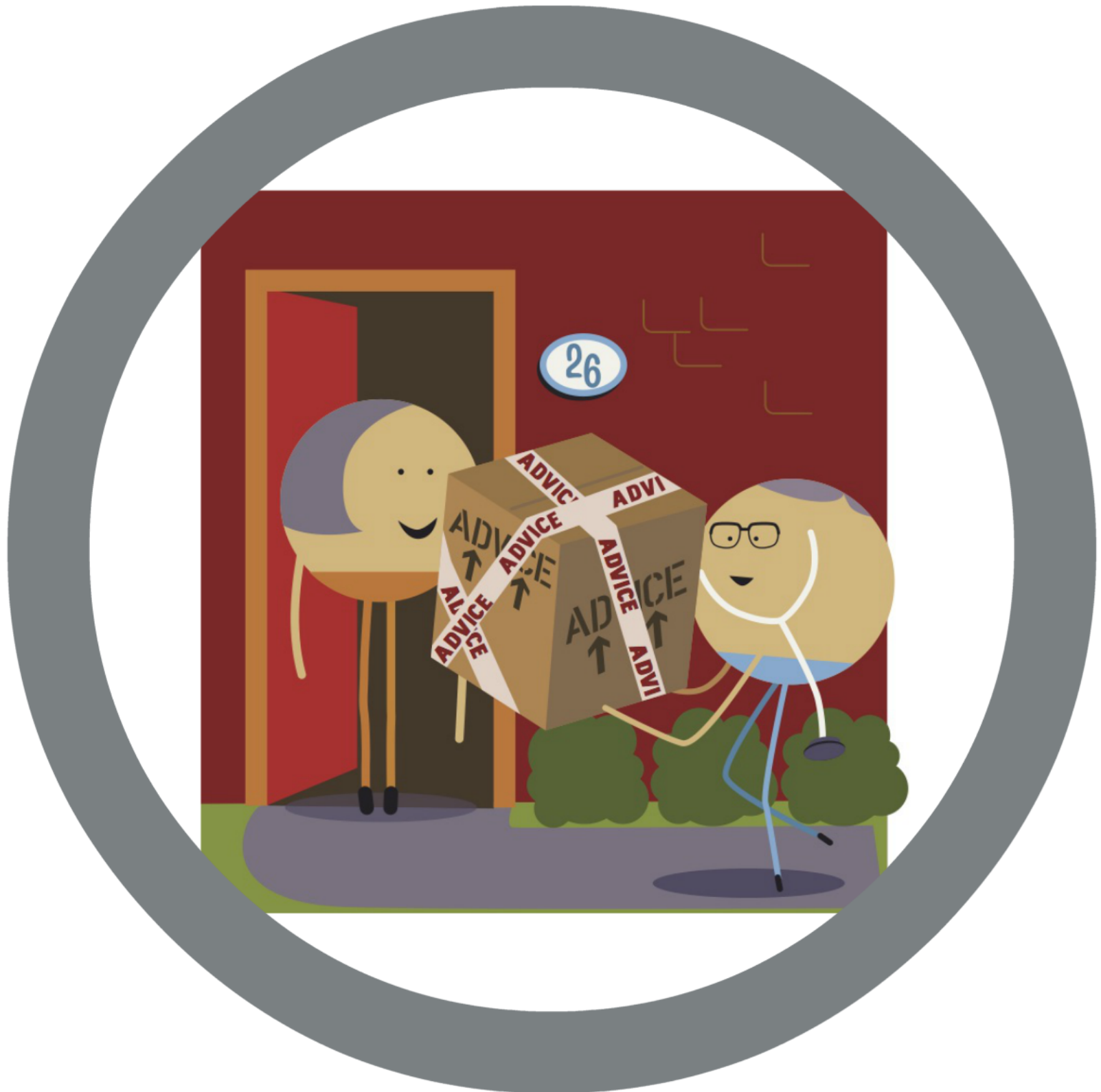
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Science is for Sharing







The
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November

www.hellobrain4ms.com

Easy-to-understand information about
brain health for people with MS

Fears for Future



?

- Focus on the physical impact
- 45-60% will experience cognitive symptoms
- significant impact - workplace
- there are things that you can do to protect cognitive functioning
- Even if not affected - no symptoms - important for later life
- Atrophy

Everyone with a brain needs to consider brain health

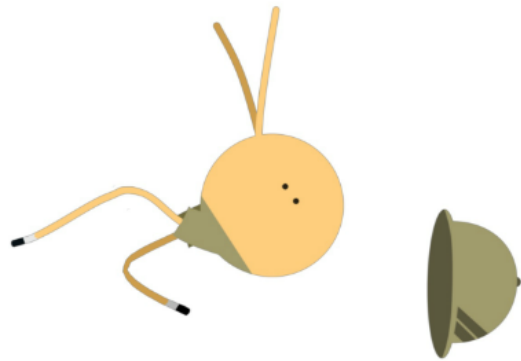


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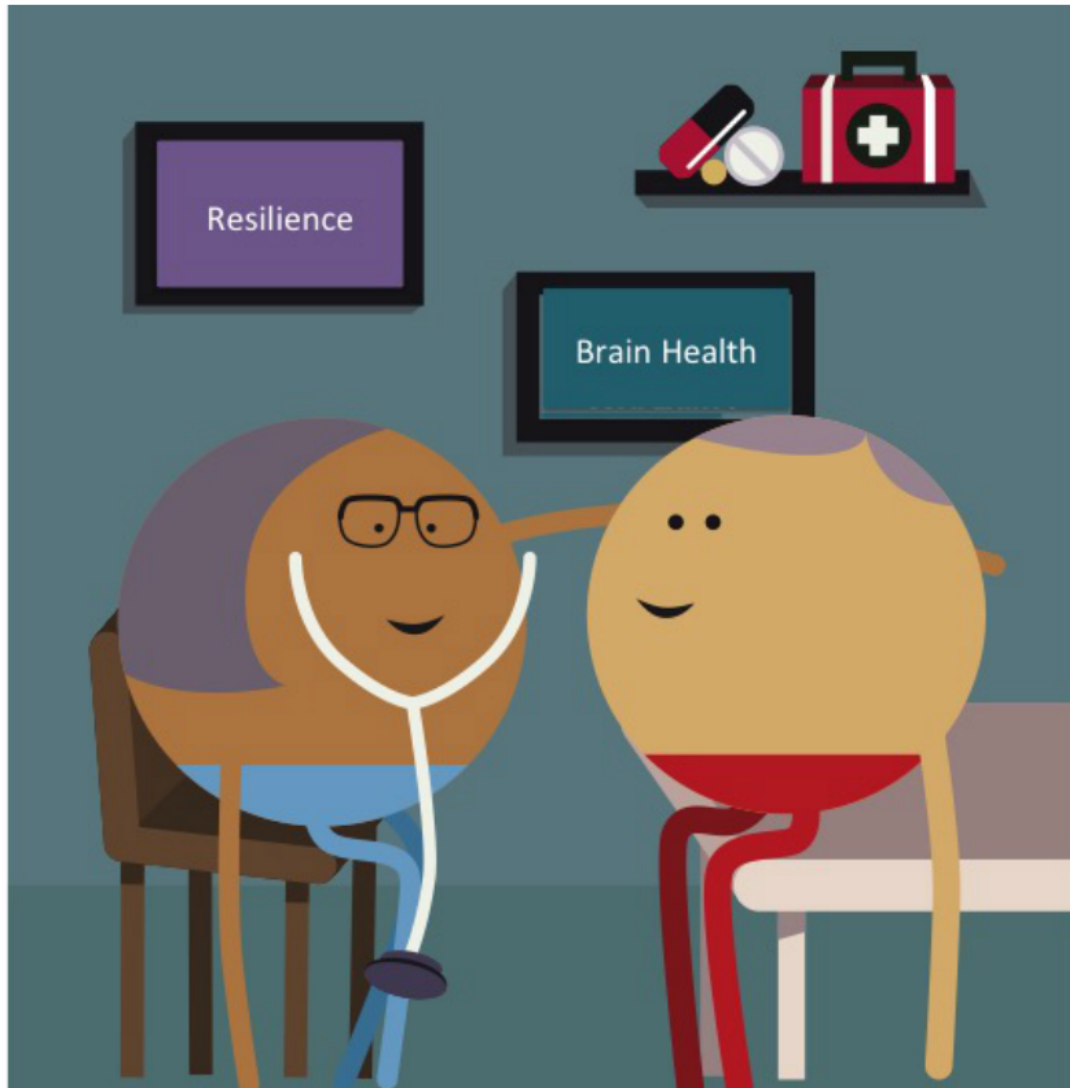


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Resilience

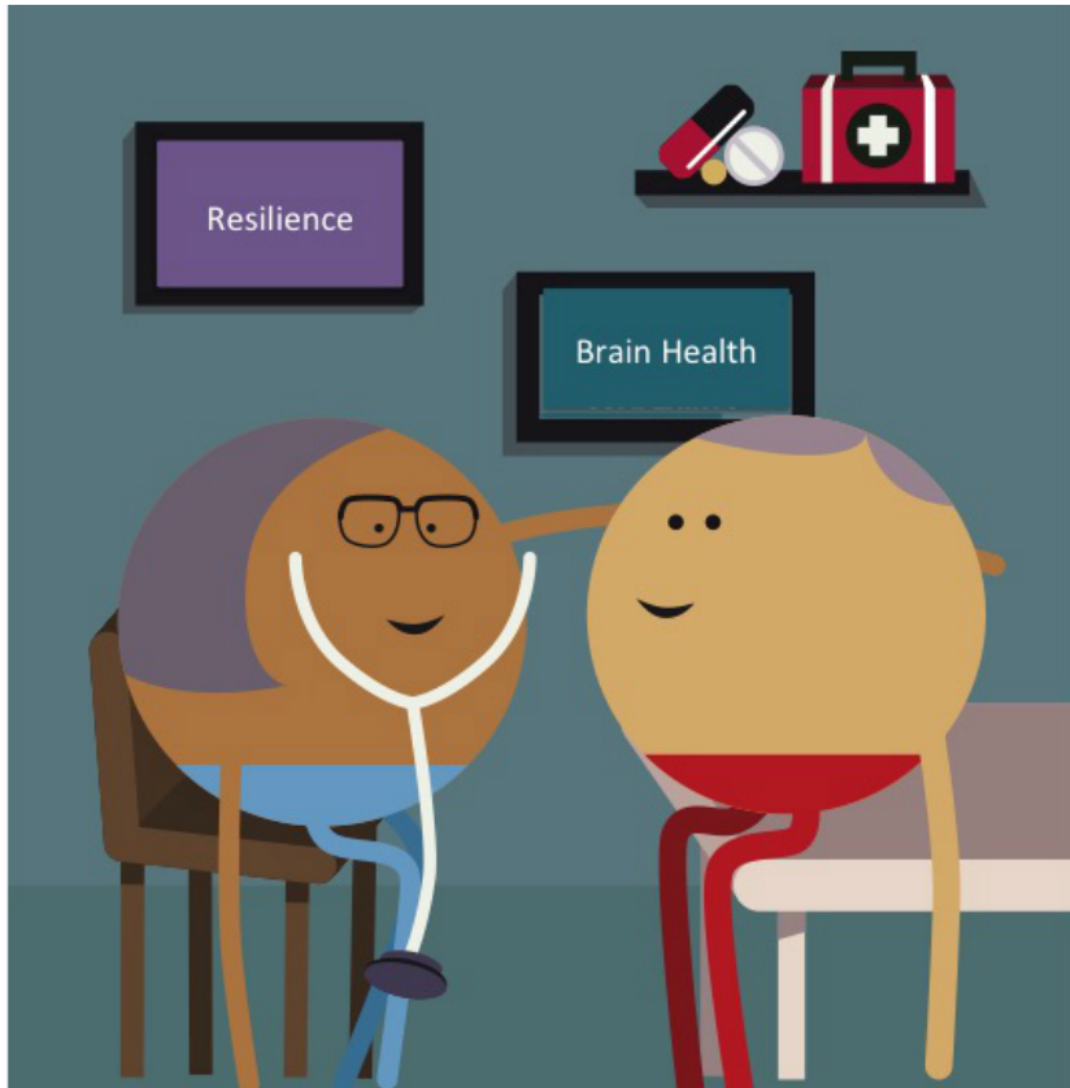


Ability to maintain relatively stable function



Cognitive Reserve

Repeated observation
no direct relationship
between the degree of
brain pathology / brain damage
the clinical manifestation of that
brain pathology / damage



Cognitive Reserve

Link CR & MS poorly understood

BUT all other things being equal

People with High CR

Lose less cognitive function than
People with Low CR

Healthy Brain Severe AD

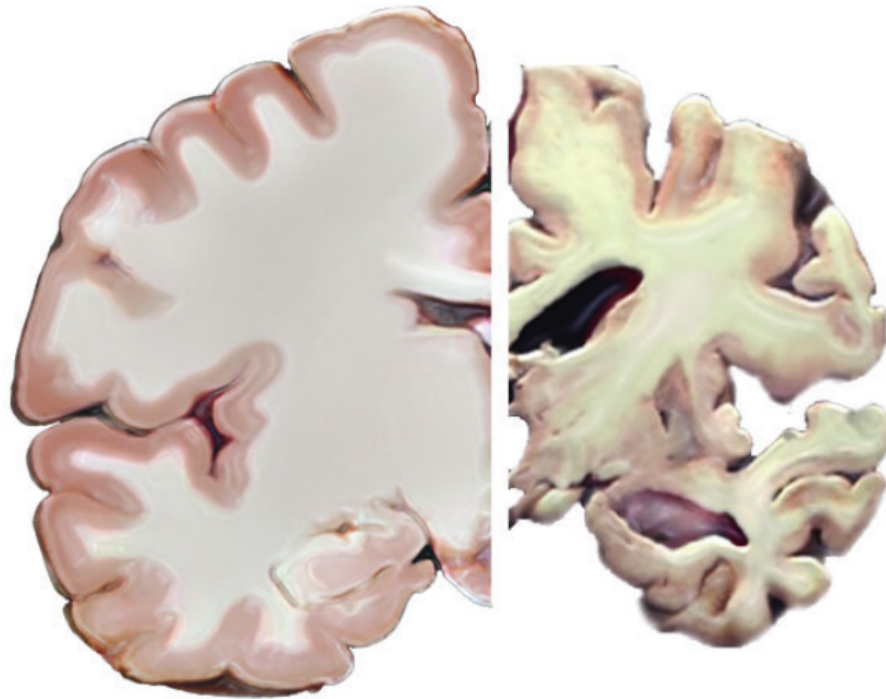


Image courtesy of the National Institute on Aging/National Institutes of Health





10 cases of cognitively normal elders who were discovered to have advanced AD pathology in their brains at death.

Katzman 1989

1990s - several scientists - several diseases

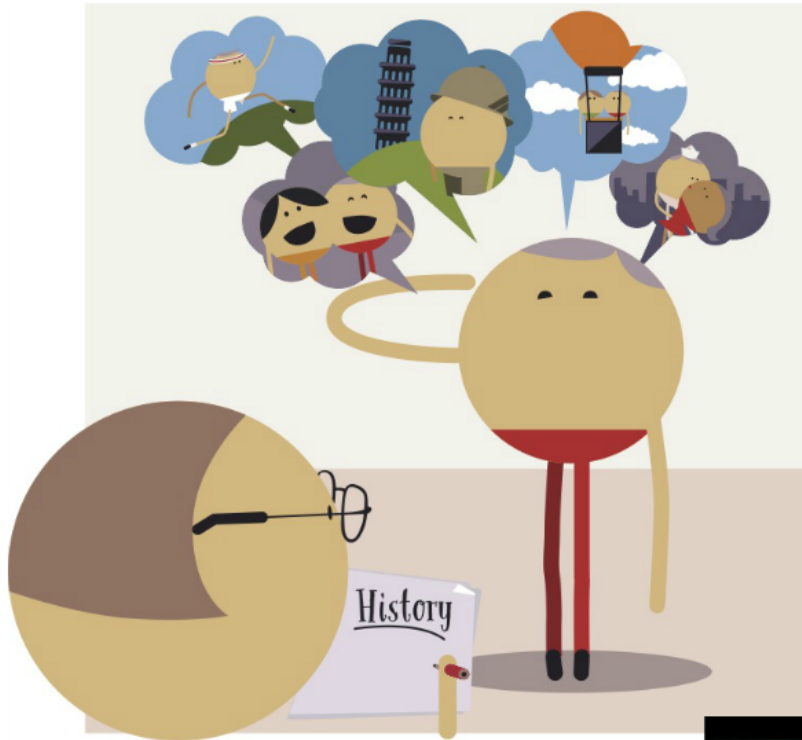


More recently scientists have been studying the concept in relation to MS
Several studies conclude that higher cognitive reserve may protect people with MS from cognitive dysfunction



Did you brush
your teeth this
morning?

The Brain - Complex System - Environment = How we Live



- What we do / What we don't do
- Lifestyle choices
- Shape it & influence
- How well it functions &
- How resilient it can be when faced with ageing, atrophy, injury or disease

People with cognitive reserve can activate more effective and more efficient networks



Resilience

Our brain is constantly changing and our behaviours and experiences can help to shape it at any age.
Our Brain is Plastic - has the ability to change - beginning of life - learn/memorise - compensate for injury

4 years

25,000



YouTube

HELLO BRAIN

Key Messages

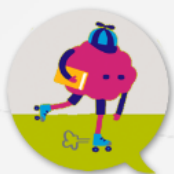
@Sabina_Brennan



Cognitive impairment is not inevitable with MS or ageing



Our brain is resilient, we can boost reserves



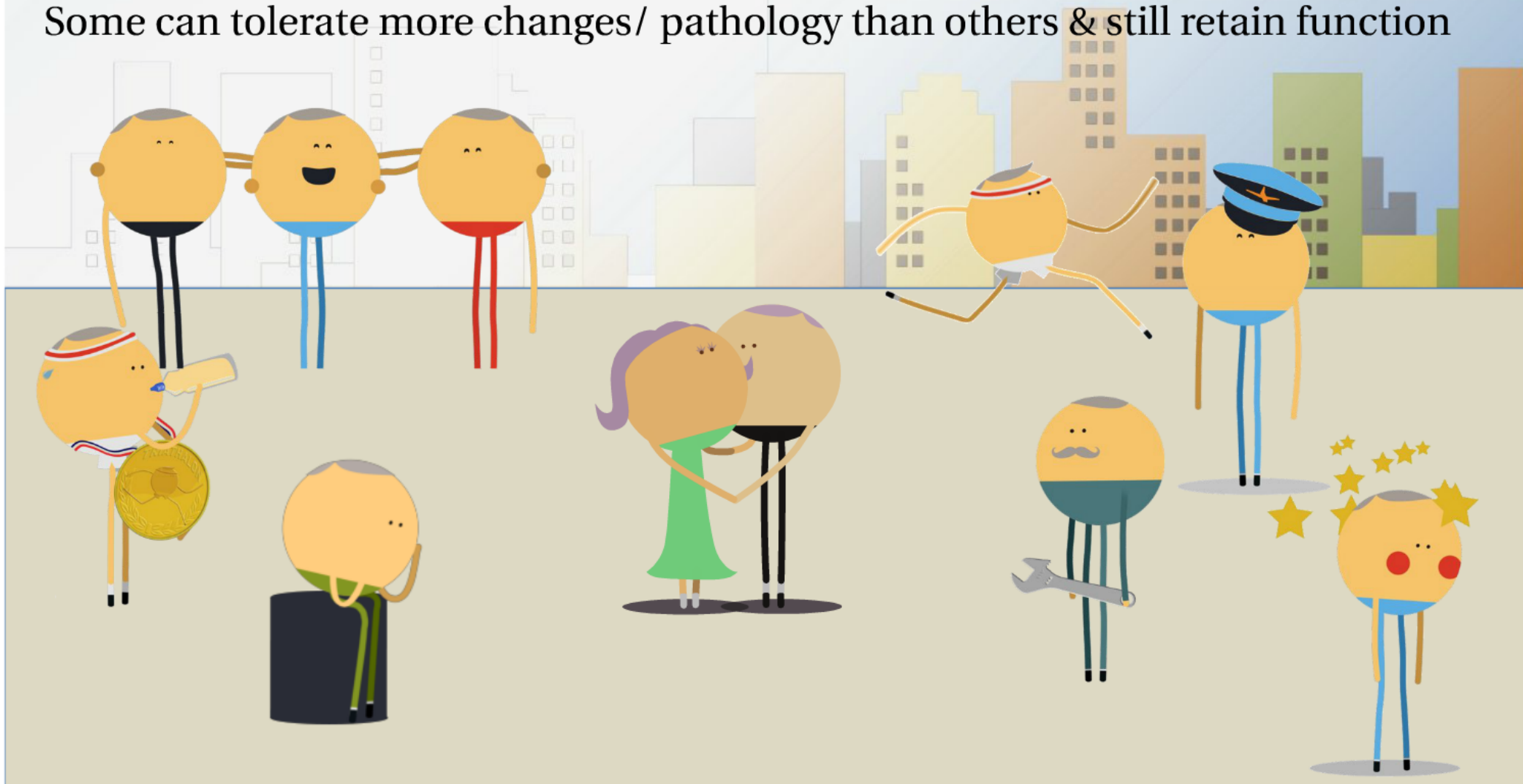
There are things that we can do to maintain our brain & build resilience
Possible and important to look after our brain health

Cognitive impairment is not inevitable

Variability

Individual differences in susceptibility to disease pathology or age-related changes

Some can tolerate more changes/ pathology than others & still retain function





Cognitive Impairment

- Severe decline of general cognitive function in MS is rare
- Cognitive Impairment can be early or late, mild or severe
- Some MS symptoms are falsely interpreted as cognitive deficits
 - poor articulation, poor co-ordination, rapid eye movement
- Some factors can temporarily impair cognitive function
 - fatigue, tiredness, emotional changes, drugs, relapses, physical restrictions, lifestyle changes
- Alcohol/marijuana affect CNS - may make worse - individual



Cognitive Impairment

- Mostly only 1 or 2 areas
- Memory (short-term / recent)
- Attention (more than one/tune out - walk/talk)
- Concentration
- Speed of processing (longer to make sense & respond)
- Problem Solving
- Word Finding
- Executive functioning
 - prioritizing thoughts - controlling expression of emotion





Strategies

- Memory Aids
 - post-its, calendars, alarms - association - visualisation - diary
- Attention
 - distractions, mindfulness, rest, pace yourself
- Speed of processing
 - permission, patience, practice, distractions
- Word Finding
 - describe it, patience, look for pictures, self cue
- Executive functioning
 - step back, take time, think, set goals schedule tasks



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Key Messages



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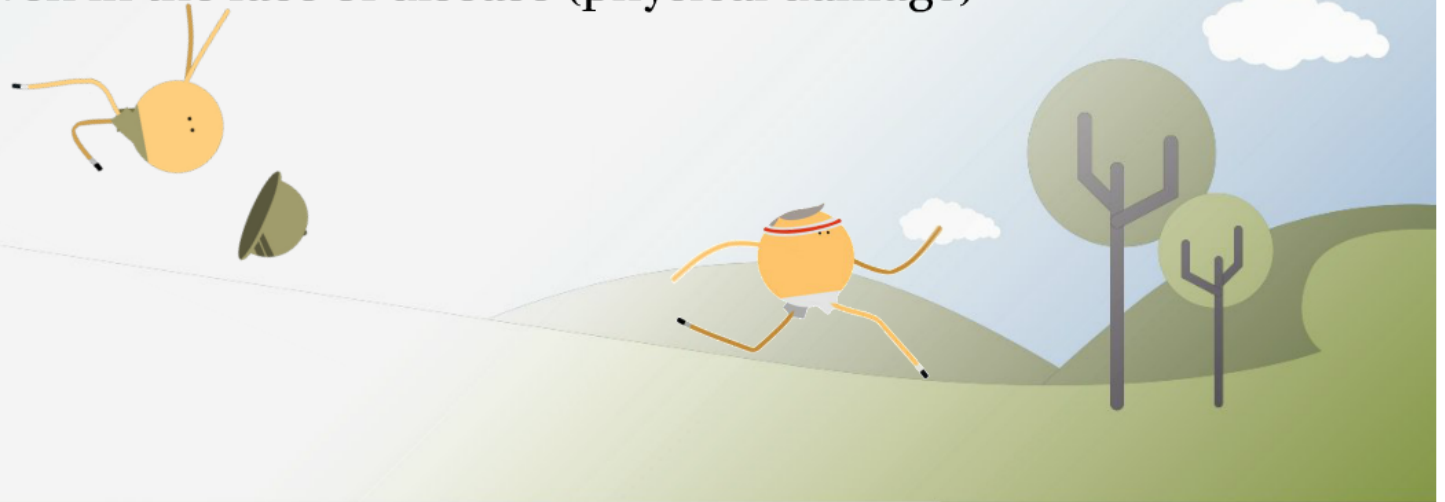


There are things that we can do to maintain our brain & build resilience
Possible and important to look after our brain health



Reserve

- Brain is resilient - resilience linked to lifestyle factors
- No direct relationship - extent of disease & clinical symptoms
- 25% during autopsy fulfill criteria for AD - clinically intact
- better brain function
- even in the face of disease (physical damage)





Neurological Reserve

- MS causes damage to the brain & spinal cord
- Repair - mechanisms exist to repair physical damage to CNS
- Neurological Reserve = the brain has an inbuilt (finite) capacity to retain function by remodeling itself to compensate for loss of nerve cells & nerve fibres in CNS
- Reroutes signals via undamaged areas / adapts undamaged areas to take on new functions
- Difficult to keep up with disease activity
- Neural Reserve - Exhausted - Depleted - Clinical / Cognitive symptoms
- Fewer resources to compensate for age-related atrophy

Maximising lifelong brain health is like preserving neurological reserve



Reserve

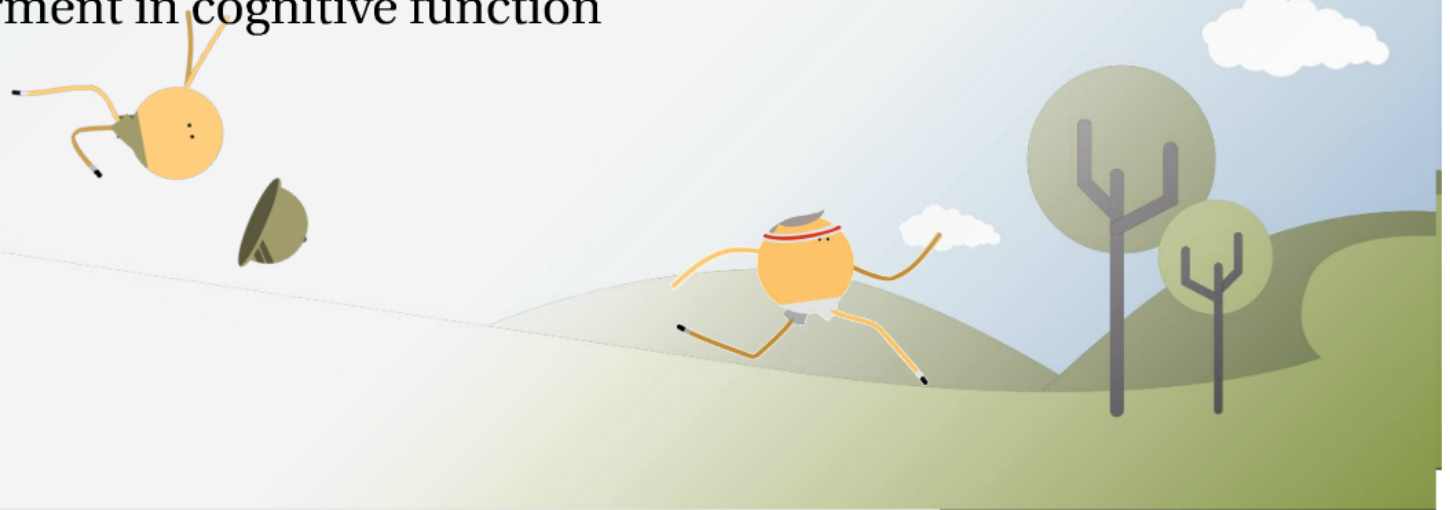
- Neurological reserve = brain reserve & cognitive reserve
- Brain Reserve = volume / size / quantity of tissue / no. of neurons
- Cognitive reserve = ability to actively compensate / to make more effective/efficient use of brain networks
- Both make independent contributions to clinical resilience to disease pathology
- Lifetime exposures including educational and occupational attainment, and leisure activities, can increase cognitive reserve and maintain brain reserves.





Reserve

- All other things being equal people with **MS** who have **high cognitive reserve lose less cognitive function** than those with less cognitive reserve for the same amount of physical damage
 - measured in terms of lesions and brain atrophy
- No direct relationship between the degree of pathology and clinical impairment in cognitive function



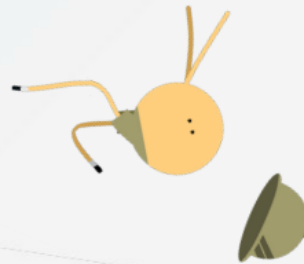


MS research infancy

Cognitive Reserve

Education & stimulating activities interact to contribute to Cognitive Reserve

- 488 (healthy) - Bronx Healthy Aging Study - 5 years
- Reading, writing, crossword puzzles, games, discussions, music
- 101 (dementia)
- Every activity day - (1 activity for 1 day per week)
- Delayed the onset of rapid memory loss for 2 months
- Positive effect independent of education level
- Never too late - lifelong



Resilience

How ?

1. more brain reserves - more neurons - more connections
2. more compensatory processes

HELLO BRAIN

Key Messages



Cognitive impairment is not inevitable with MS or ageing



Our brain is resilient, we can boost reserves



There are things that we can do to maintain our brain & build resilience
Possible and important to look after our brain health

Brain Healthy Lifestyle

Those with better cardiovascular health who have been more physically, socially, and mentally active, who have adopted healthy eating habits, who don't smoke and drink alcohol in moderation are less likely, on average, to develop dementia



Better brain health - more reserves

Ingredients but not the recipe.





Cardiovascular

- hypertension
- diabetes
- obesity

Psycho-social

- depression
- social isolation
- loneliness

Health Behaviours

- smoking
- excess drinking
- low level physical activity
- low level mental activity



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**WHAT CAN YOU DO
TO KEEP YOUR
BRAIN HEALTHY
???**

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Top Tips for Brain Health



Get physically active



Stay socially engaged



Challenge your brain



Manage stress, think young, think positive



Adapt your lifestyle to protect your brain



Get Physically Active

Why?

- Brain - good supply of nutrients & oxygen
- Activity - direct benefit on structure & function
- Inactivity - increased risk of CV Disease
- aerobic fitness in MS
 - faster information processing
 - preserved brain tissue volume

Exercise

- helps to grow brain connections
- associated with
 - better cognitive function
 - increased activity in brain cells - attention
 - may improve day-to-day memory
 - reduced levels of depression, stress and anxiety
- good for brain health because it improves mental health
- FIND A WAY TO BE ACTIVE

Benefits



Top Tips for Brain Health



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Stay Socially Engaged

Why? Social Networks - Neural Networks

People with more social ties

- live longer
- better health
- less depressed
- less like to develop cognitive impairment
- loneliness & social isolation - smoking & obesity

Loneliness is a killer

Benefits Social Interaction

- 10 minutes can increase brain performance
- may deliver greater benefits than solving crossword puzzles
- rewarding, maintain brain health & may reduce risk

Top Tips for Brain Health



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Challenge Your Brain

Why?

Life-long learning & education

- good for brain health
- lower risk of dementia
- optimize performance
- education, reading, hobbies, artistic/creative past-times
 - protection in MS over lifetime

Challenging yourself, doing new things & learning are vital for brain health

Benefits

- Learning generates new brain cells,
- enriching brain networks
- opening new routes that the brain can use to bypass damage



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Attitude

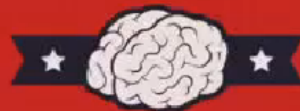
Manage Stress - Positive Attitude - Present-mindedness

Why?

- Chronic stress structural/functional effects on the hippocampus
 - Impairs memory function ability to learn (vital for brain health)
 - concentration
 - can set the stage for depression & dementia - immune function
- Positive Thinking
- Present-mindedness - Attention - Memory
- Balance



**WHY IS
ATTENTION
IMPORTANT?**



Top Tips for Brain Health



Get physically active



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Challenge your brain



Manage stress, think young, think positive



Adapt your lifestyle to protect your brain



Adapt Your Lifestyle

smoking, sleep, hypertension, diabetes, diet

Why?

- Lifestyle choices influence brain health
- **Smoking** - Cardio Vascular Health - Toxins
- associated with
 - decreased brain volume in MS
 - more cognitive problems
- **Sleep**

Benefits

- Also benefit cardiovascular, physical and mental health
- Brain builds memories while you sleep - good sleep habits
- Manage hypertension
- Maintain a healthy weight



SMILE



5 A Day

- Its free
- Boosts the growth of brain cells in hippocampus
 - Learning and memory
- Improves your brain nerve health
- Releases hormones that make you feel good
- Lowers blood pressure
- Boosts immune function
- Protects against stress, anxiety and depression
- Simple act of smiling makes you feel happy even if you are not

- Its free
- Boosts the growth of brain cells in hippocampus
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