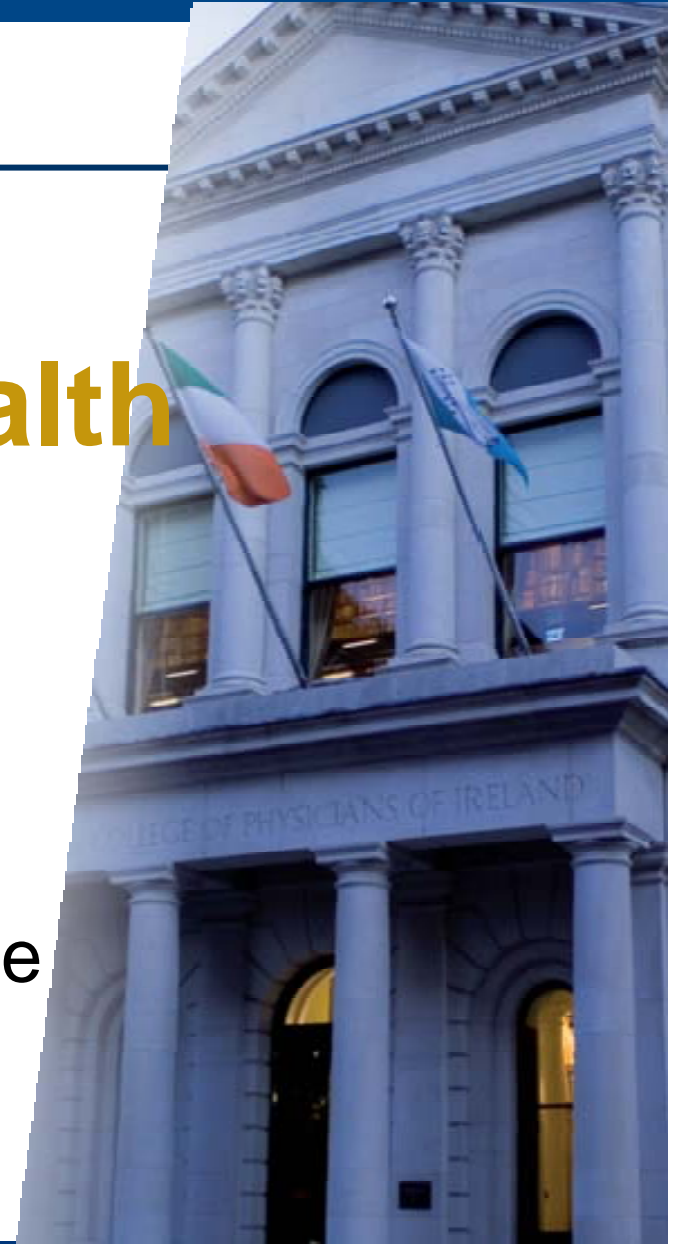




Improving brain health

Professor Brian Lawlor,
St. James's Hospital & Trinity
College Institute for Neuroscience





Brain ageing: Fact or fiction

It's all downhill after age 30.....

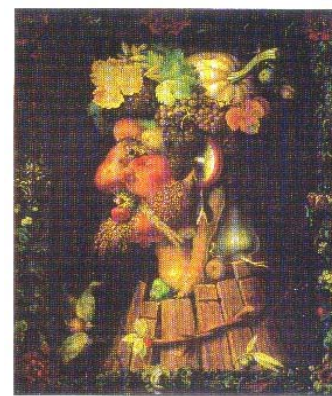
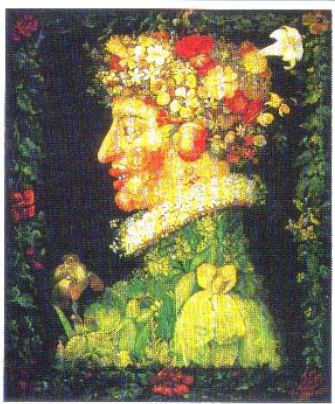
You can't teach an old dog new tricks



Are you more or less mentally sharp than you were when you were aged twenty? – ie memory, problem solving, thinking, concentration.



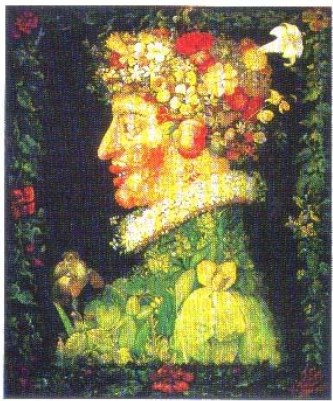
If the body changes.....



So does the brain



... causing changes in memory...

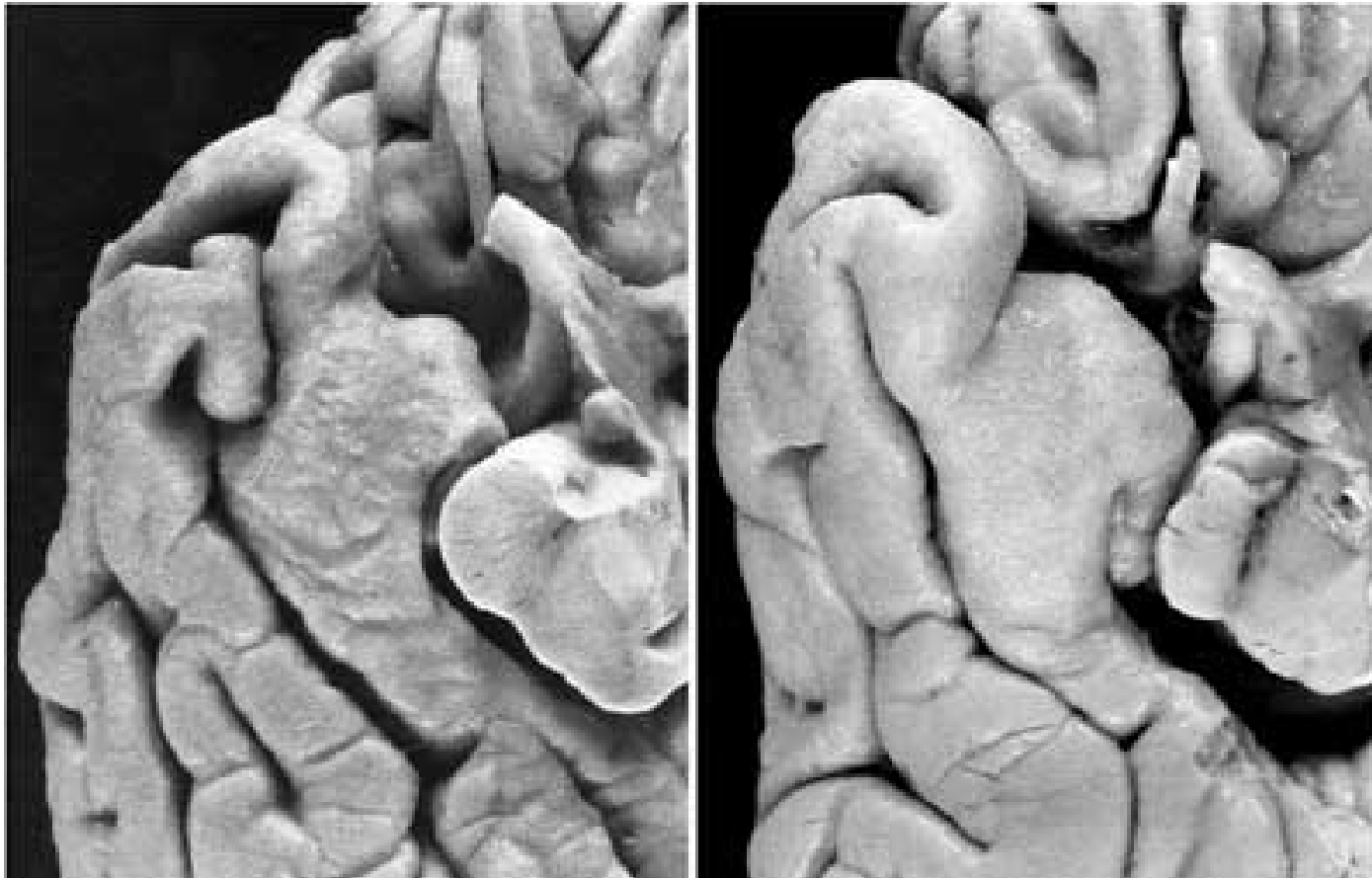


... concentration, problem-solving, distractibility ...



Brain ageing- some facts

- After age 60, the **brain shrinks**, losing around 0.5-1% of its volume per year
- The effects are greatest in the **frontal lobe area** (responsible for remembering a telephone number while you're dialing and planning, focus, and behavior choices), and sometimes in the **hippocampus**, involved in memory.
- Brain cells' **dendrites and axons** —the slender filaments that transmit electrical impulses—**shrink**.
- **Nerve fibres** that transmit signals from one brain region to another, starts to **degrade** around age 50.





Brain ageing effects & cognitive function

- It requires **more effort** to remember what you wanted to buy at the supermarket, to process and respond to information, and to reason your way through a problem
- It takes **more time** and effort but accuracy remains the same
- You can compensate by **practising** more
- **Vocabulary** tends to be **preserved**, as do skills practiced for a long time and that don't require processing speed
- Some cognitive skills might even improve: **knowledge and wisdom**:- the best cruciverbalists of all ages are in their 60s and 70s.



The power of ageing brain

- Greater **flexibility**
- More **relativistic**
- More **reflective**
- **Tolerance for ambiguity** and manage relationships
- **More positive bias** -less focus on negative-more interaction between brain areas that deal with emotional response (e.g.amygdala and anterior cingulate cortex)
- Older brains **use both hemispheres** and 'recruit'

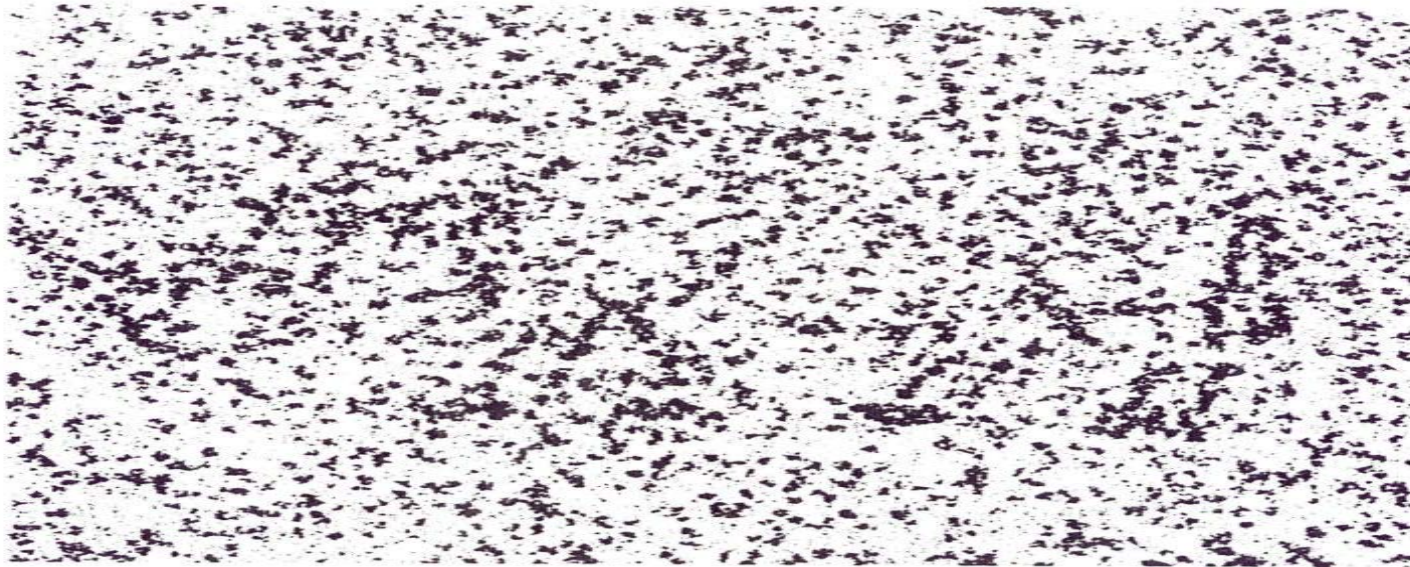


YOUR AGEING BRAIN IS STILL *PLASTIC*



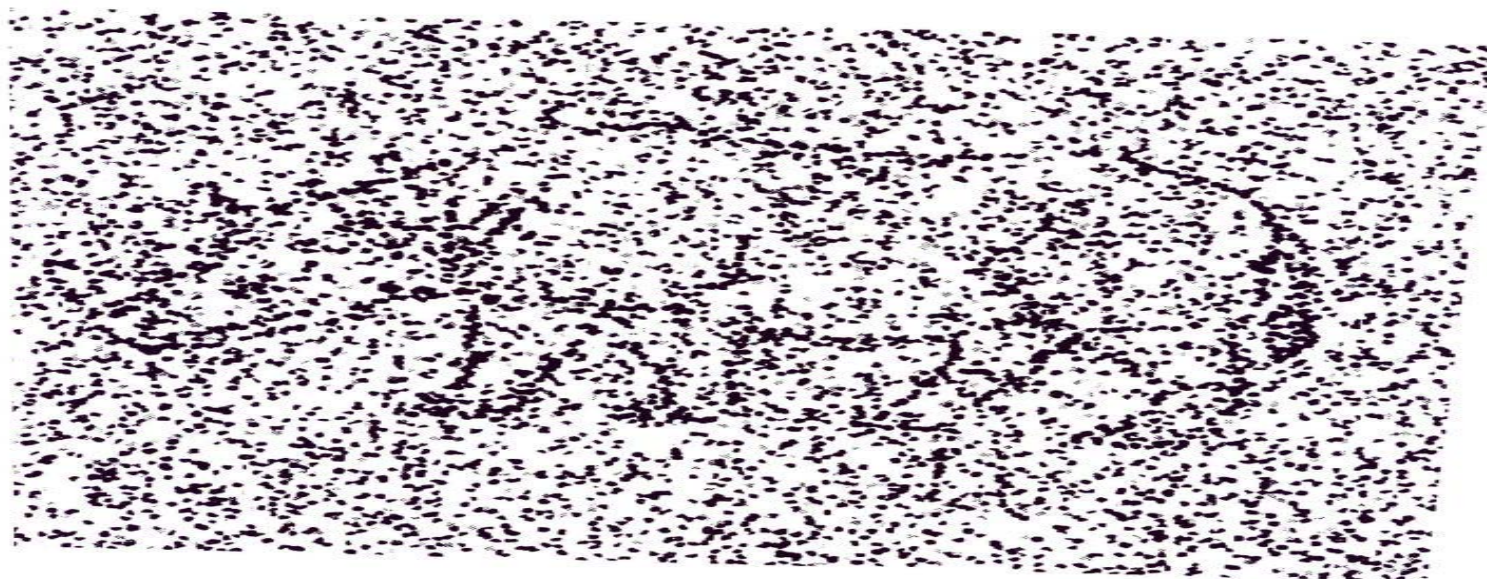


Can you see anything?



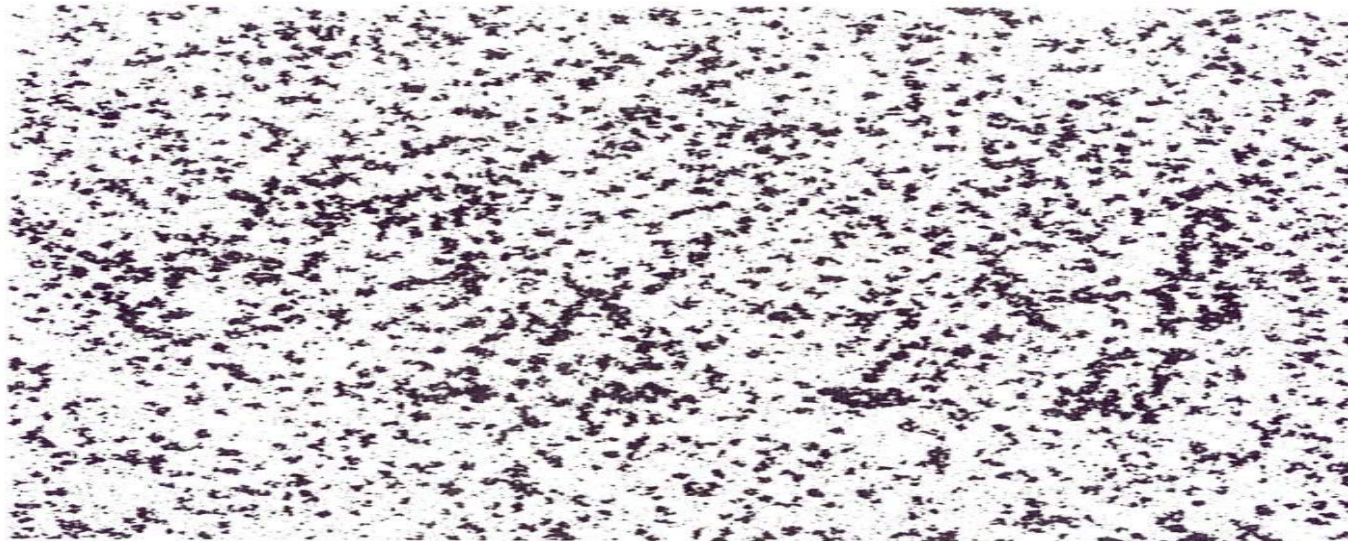


Can you see anything?





Can you see anything?





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Keeping Your Brain Fit

There's plenty you can do to slow the effects of aging.



Seven secrets of staying sharp

- Aerobic exercise
- Mental stimulation
- New learning
- Reduce stress
- Keep socially active
- Healthy diet
- Think positively



1. Physical exercise

The old fashioned way



Exercise is good for your brain

- Improves recall in those with subjective memory complaints
- Effect of aerobic exercise are primary in the domains of attention and **processing speed**
- Aerobic exercise **increases brain size** by 3%
- Exercise **increases blood flow** to memory centres and can enhance cell sprouting and may prevent mini-strokes
- Exercise **boosts cognition** relatively more than memory training



2. Mental Stimulation

Neurobics

Mental or cognitive workout:



- Mental Training effects were of a magnitude equivalent to the amount of decline expected in elderly persons without dementia over 7- to 14-year intervals (Ball et al JAMA 2002)
- Cognitive training resulted in improved cognitive abilities specific to the abilities trained that continued 5 years after the initiation of the intervention (Willis et al. JAMA 2006)
- Those in more mentally demanding jobs show much lower levels of cognitive decline



Brain fitness

- **ACTIVE STUDY:** 10 X 60-to-75-minute training sessions in reasoning—specifically, in recognizing word, number, and letter patterns and filling in the next item in a series—reported less difficulty with such activities of daily living as understanding instructions on a medication label
- The effects still were apparent five years later
- **IMPACT STUDY:** Subjects spend an hour a day for eight to 10 weeks using six games focused on sounds to improve listening, processing and memory skills and performed better than the control group on memory and speed tests
- The amount of memory improvement was equivalent to going back 10 years in your abilities, processing speed increases by 131% and effects generalised to everyday functions



3. New learning



**When did you last
learn something
new?**



Benefits of new learning

- New learning has profound effects on brain function in the laboratory
- Preliminary results with humans suggest there may be parallel effects
- The brain is plastic and expands with experiences

Gould et al, Nature Neuroscience 1999

Markam & Greenough 2006



4. Reduce stress (easier said than done)



Effects of stress

- Alleviating severe stress can enhance brain function, particularly memory
- Stress hormone cortisol interferes with memory



How to reduce stress

- A greater sense of control is central to reducing stress
- Relaxation can help control
- Mindfulness and meditation can improve control and reduce stress



5. Keep socially active and connected



Social connection

- In laboratory and every day life, cognitive function is related to enrichment of the environment
- Those who were socially engaged and not lonely were less likely to develop Alzheimer's disease



6. Eat a brain enriching diet

Healthy diet

- Foods high in saturated fats associated with decline in cognitive function
- Opposite for dark fruits, vegetables and fish
- Alzheimer's disease associated with low PUFA levels
- We don't know if enriching diet will delay or prevent Alzheimer's disease



7. Think positively



Think positively

- How we think can influence our behaviour
- Effects of attitude and personality: optimism vs pessimism; conscientiousness versus worry/neuroticism-all of these may influence cognitive performance and how our brain ages

Can we decrease our risk of Alzheimer's?

Risk factors

- Age
- Family history-genetics
- Head injury
- Down's syndrome
- Smoking & excess drinking
- Blood pressure, cholesterol
- Depression
- Mid-life obesity
- Loneliness

Protective factors

- Education
- Oestrogen
- NSAIDs
- Vitamin E
- Exercise
- Fruit & veg
- Omega 3 fatty acids
- Red wine
- Social connection



Omega-3 fatty acids are found
in oily fish like salmon and
flaxseed and canola oils



#ADAM





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Acknowledgement:

Special thanks to Prof. Ian Robertson, Trinity College Dublin, Institute of Neuroscience, for allowing the use of some of his material in this presentation