



Preventing Dementia

Thursday 17 May 2018

Forestville Memorial Centre



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Professor Sharon Naismith
University of Sydney



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Optimising healthy brain ageing: Sleep, exercise and brain training

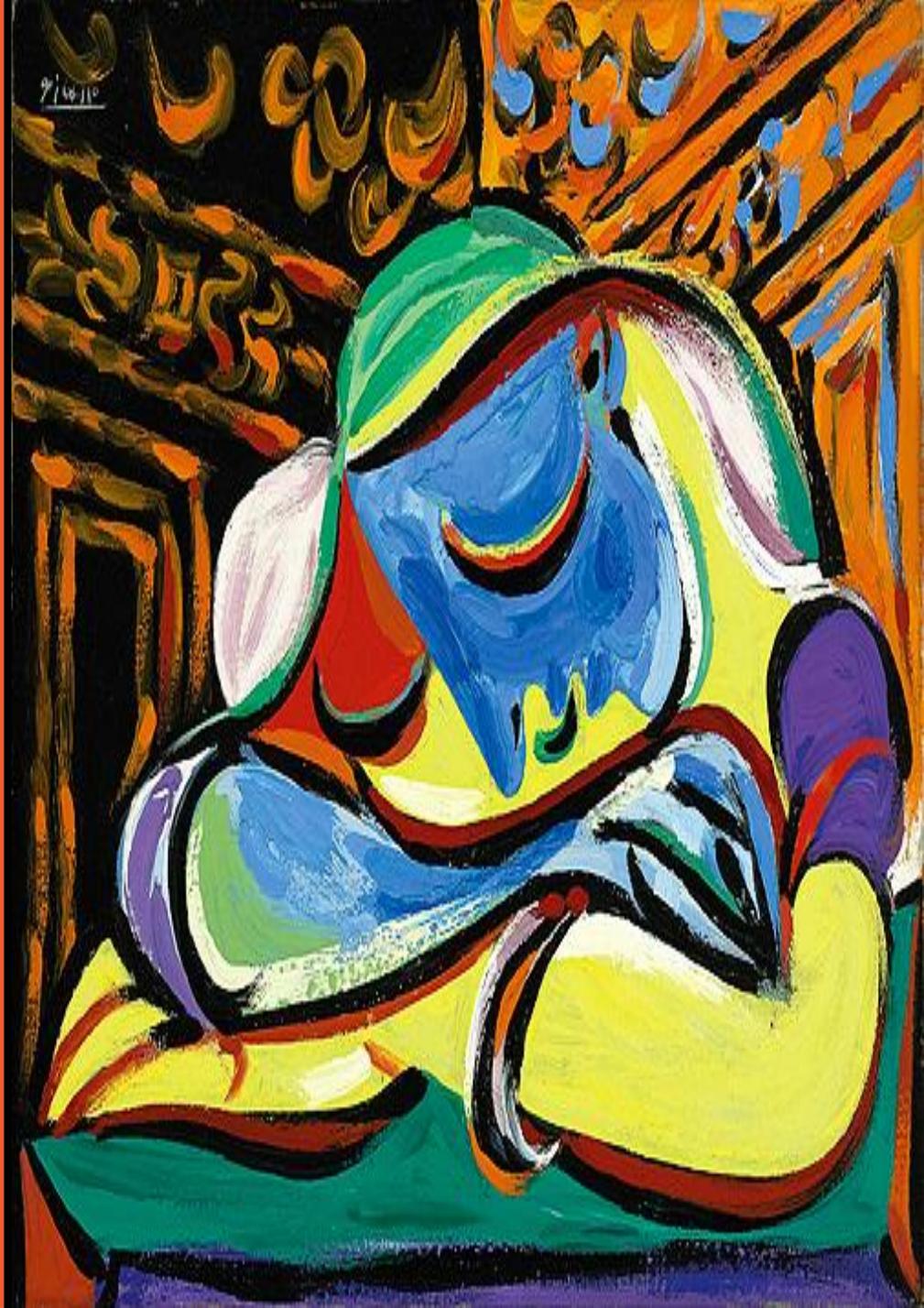
PROFESSOR SHARON NAISMITH

Leonard P Ullman Chair,
NHMRC Dementia Leadership Fellow

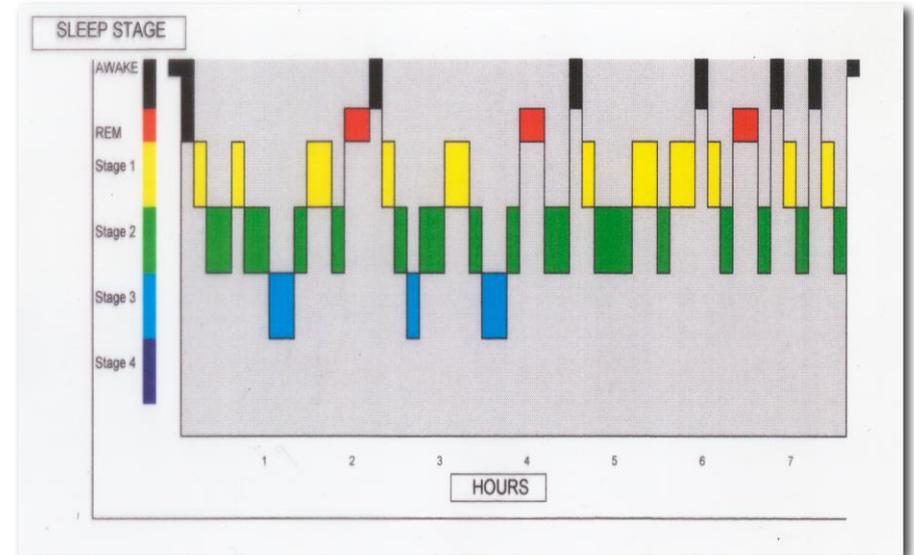
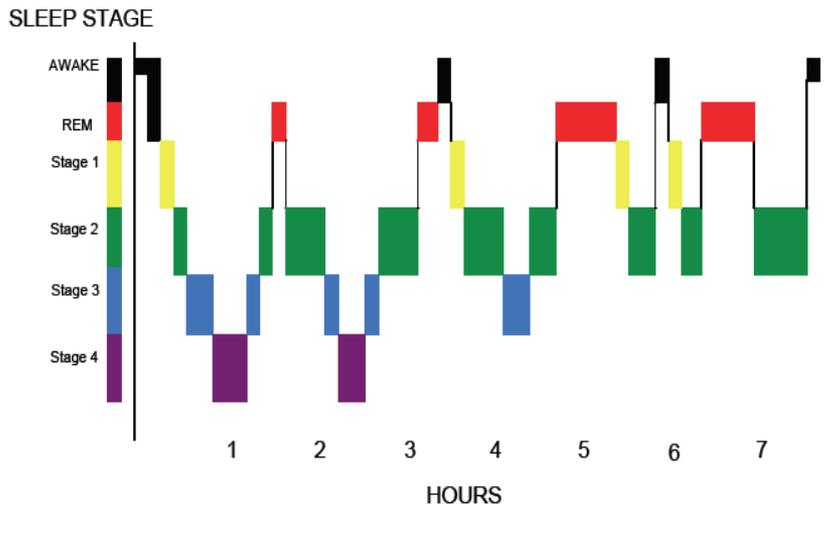
Charles Perkins Centre, and,
Head, Healthy Brain Ageing Program,
Brain and Mind Centre



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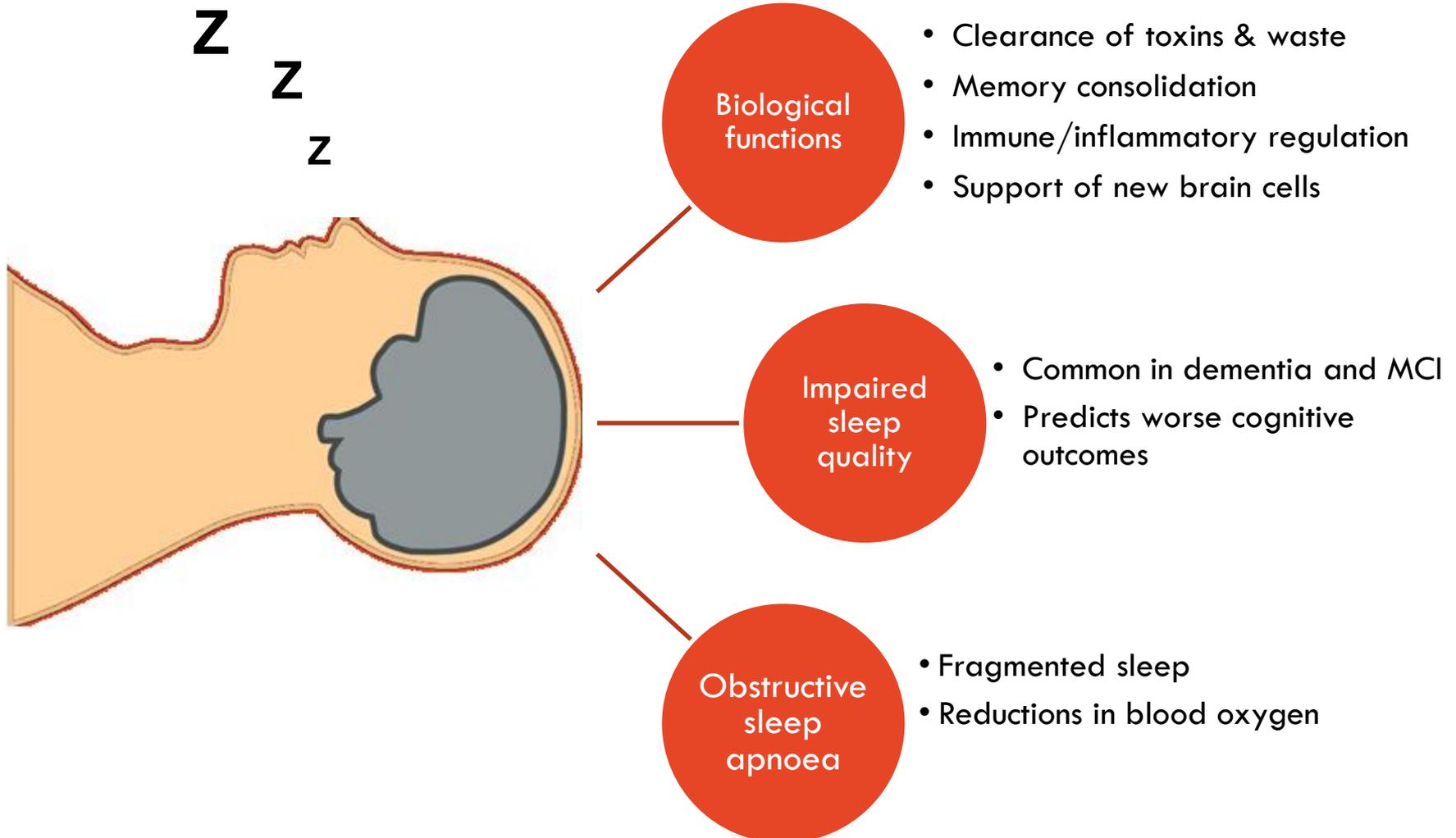


How does sleep change with ageing?



- Shallow, fragmented
- Decreased deep (slow wave) sleep
- Decreased dreaming (REM) in second half of night
- Shorter sleep
- Daytime sleepiness
- Shift to earlier sleep and wake times (circadian advance)

Why is healthy sleep important for a healthy brain?

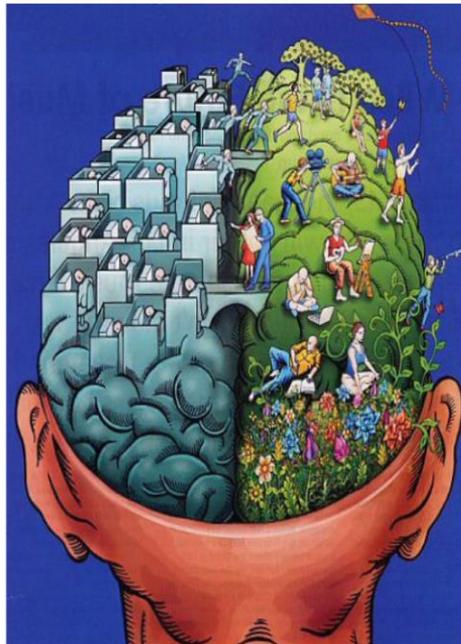


Some factors affecting sleep in older people



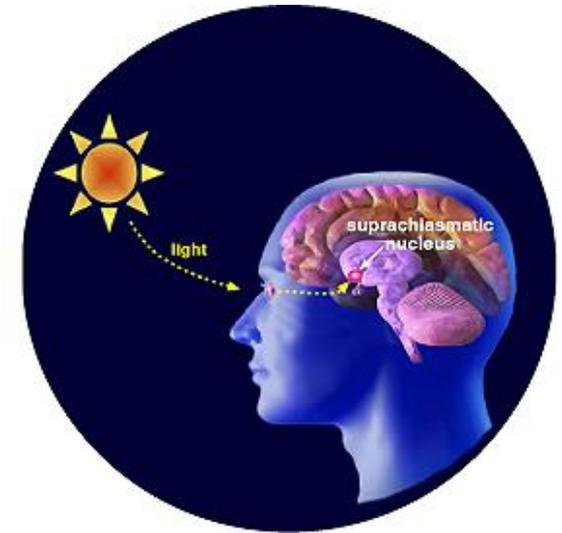
Top 10 tips for healthy sleep

1. Mind your mind - depression!
2. Mind your mind – stress and anxiety
3. Keep physically active
4. Keep mentally active
5. Have realistic sleep expectations & consider sleep pressure



Top 10 tips for healthy sleep

6. Keep your body clock ticking on time
(behavior, light, melatonin)
7. Use naps wisely!
8. Listen for snoring /sleep apnoea
9. Beware medications, caffeine and alcohol
10. After you've tried everything...



Physical Exercise for a Healthy Brain and Mind



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How can we optimise healthy brain ageing?

- Over half of the disease burden of Alzheimer's Disease is attributed to modifiable risk factors:

- Diabetes, 3%
- Midlife hypertension, 5%
- Physical inactivity, 13%
- Obesity, 2.0%
- Depression, 8%
- Smoking, 14%
- Low cognitive activity, 19%

Can be
managed via
exercise

Proportion of Australians with
insufficient exercise:

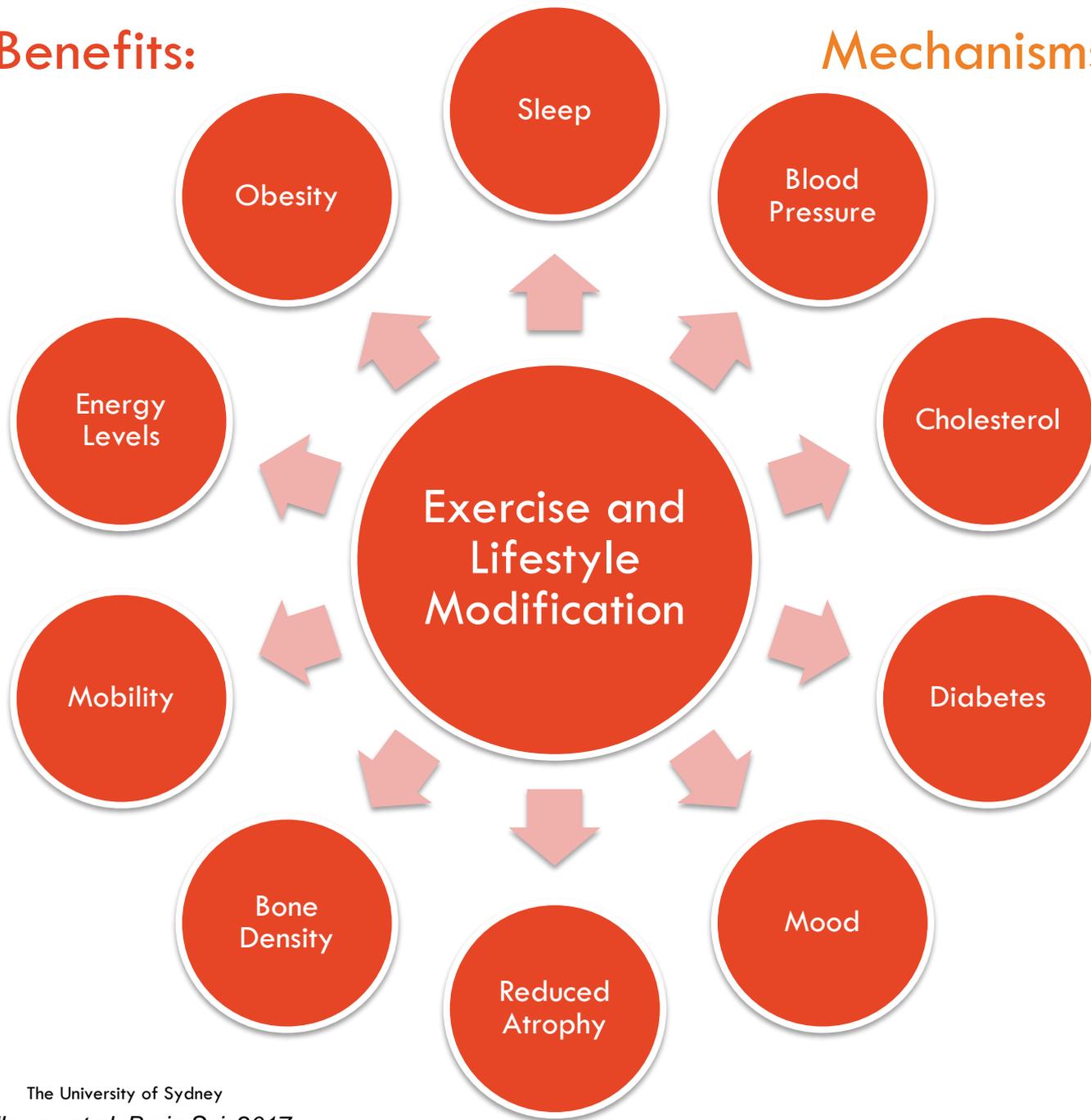
- 55-64: 58%
- 65-74: 61%
- 75+ 75%

2011-2012 Australian Health Survey



"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"

Benefits:



Mechanisms:

Increased Blood Flow in brain

Reduced Inflammation / Oxidative Stress

Release of Neurotrophins

Management of Vascular Risk Factors

Growth of new blood vessels

Treatment / Prevention of Depression

Does exercise help our cognition?

- Yes!
- Midlife fitness = higher brain volume two decades later in individuals free from CVD, stroke or dementia
- Improved memory + cognitive functions
- In people aged >50yrs:
 - Strong evidence for aerobic and resistance training programs
 - Moderate-vigorous intensity exercise for 45-60min is most beneficial
- US study
 - Followed 1740 people >65 years old
 - After 6-years, people who exercised >3 times/week had a 32% reduction in risk of developing dementia

Physical activity is associated with a 40% lowered risk of dementia

(Ontario Brain Institute study of 24 RCTs & 21 prospective studies)



What should you do?

- **Aerobic** (e.g. dancing, walking, swimming)
 - >30min of moderate intensity exercise >5 days
or 20mins vigorous >3 days / wk
 - Intermittent exercise accumulated in >12min bouts is as effective
 - ?High intensity interval training may be more effective
- **Muscle strengthening** (e.g. sit-to-stand, push-ups, weights)
 - >2 days/wk, 2-3 sets of 8-12 reps, 2-3min rest between sets
 - Start at a low intensity and then increase weight/repetitions
 - Allow 48-72 hours recovery period between sessions
- **Flexibility** (e.g. tai chi, yoga)
 - >2 days/wk - balance, agility and coordination exercises
 - Reduces falls risk and improves activities of daily living



Brain training



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What is cognitive training?

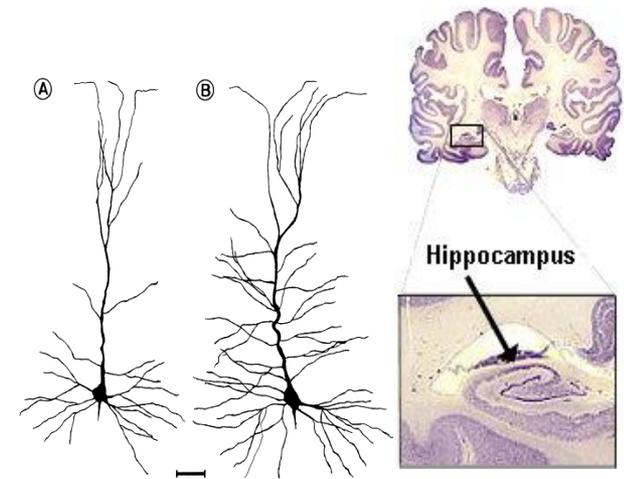


- Easiest to think of it as a ‘brain gym’
- Repeated exercises targeting a specific cognitive skill (e.g. memory)
- Aim is to
 - improve that skill directly (RESTORE), or...
 - Recruit other skills/pathways to achieve the same goal (COMPENSATE)
- Can involve either / both computer-based and strategy-based methods

How does cognitive training work?

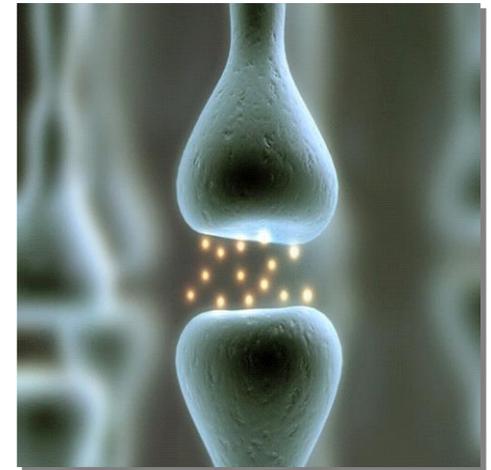
- Neuroplasticity:

- Ability of the brain to reorganise/re-wire itself in response to external stimuli



- Cognitive reserve:

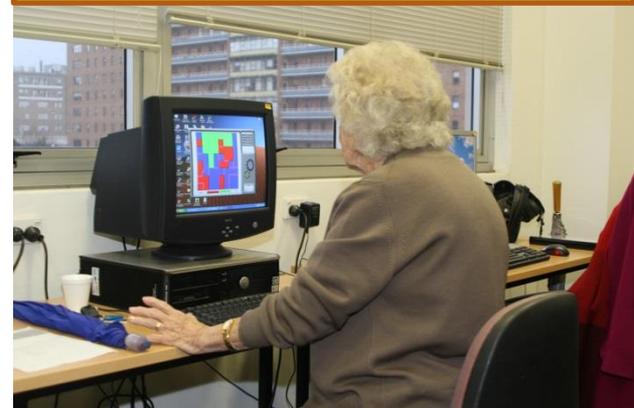
- People with higher levels of lifetime complex cognitive activity are more resilient to pathological brain changes
- Cognitive / neuronal reserve mediates the point at which clinical symptoms emerge, as well as their trajectory over time



Does cognitive training work?

- YES!
 - Healthy older adults
 - 'At risk': Mild Cognitive Impairment, depression
 - Strongest effects shown in memory
 - Some studies also show concurrent brain changes
 - NO harmful effects have been reported
- **Not as effective for those with dementia**
 - ? Capacity to learn and apply benefits, brain pathology
- **When does it work best?**
 - More research required....
 - Up to 3 times per week, at least 30 minutes
 - Group-based, facilitated programs
 - Multi-faceted programs may be best
 - (e.g. combined with exercise, diet, education, psychological therapy)
- **Examples:**
 - **Brain HQ, Lumosity, Nintendo Brain Trainer, Tetris, Candy Crush etc.**

Pooled data across studies shows that complex mental activities are associated with a 46% lowered risk of dementia



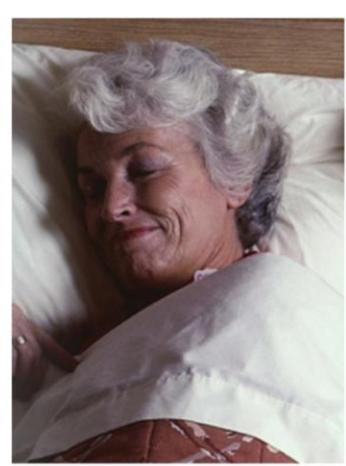
Strategy-based cognitive training

- **Aim to ‘take the strain off the brain’**
- **External strategies**
 - Compensatory tools
 - Common sense
 - Can be more reliable
 - Need to have consistent access!
- **Internal strategies**
 - Adapting the way you think
 - Generally more challenging / mentally stimulating
 - Your brain is always with you!



Summary

- Sleep is important for optimising brain health and consolidating memories overnight
 - Improving sleep is best achieved using non-drug methods
- Exercise has been hailed the ‘wonder drug’ for many health conditions and is important for healthy brain ageing
 - Consult a physician, exercise physiologist and set small realistic goals to get started
- Brain training has beneficial effects on memory
 - It is best achieved using challenging tasks at least 3 times per week.
 - Engaging in new courses and keeping socially active is also important



Healthy Brain Ageing (HBA) Program

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Seeking healthy participants with
no cognitive concerns



Goals

1. To identify **biomarkers** for cognitive decline from midlife onwards
2. To test **novel interventions** for cognitive decline: Cardiovascular, lifestyle (exercise & diet), depression, brain training, sleep

Clinical team:

- Neurologists: Prof Simon Lewis
- Geriatricians: Dr Catriona Ireland, Dr Jerome
- Neuropsychologists: Prof Sharon Naismith, Dr Loren Mowzowski, Dr Haley LaMonica
- Exercise physiologists: Dr Shantel Duffy
- Psychiatrists: Prof Ian Hickie
- Dietician: Dr Alice Gibson



Thank You



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