Henry Brodaty

- Diagnosis of dementia
- Management of BPSD
- Prevention of dementia

- Dementia Collaborative Research Centre
  [www.dementiaresearch.org.au](http://www.dementiaresearch.org.au)
- Centre for Healthy Brain Ageing
  [www.cheba.unsw.edu.au](http://www.cheba.unsw.edu.au)

University of New South Wales (UNSW Australia)
Potential conflict of interests

Advisor, consultant, remunerated speaker and/or investigator for multiple drug companies
Diagnosis
Do not dismiss complaints as *old age*

- Prevalence of subjective cognitive complaints (SCC) in older people
  - Review of SCC prevalence, rate of 25-30%\(^1\)
  - In Sydney Memory and Ageing Study
    95.5% of participants (70+ yrs) or informants endorsed SCC *if asked* \(^2\)

\(^1\) Jonker et al. 2000 *Int J Geriatr Psychiatry*, 15, 983-991
\(^2\) Slavin et al. (2010). *Am J Geriatr Psychiatry*, 18:8, 701-710
What is dementia?

- An umbrella term to describe a syndrome
- Usually progressive and irreversible
- Over 100 causes

1. Alzheimer’s disease = most common
2. Vascular dementia (multi-infarct dementia; cerebrovascular disease)
3. Lewy body dementia
4. Fronto-temporal dementias
5. Mixed AD and VaD, especially with old old age
What is dementia – DSM5 definition

• Decline in $\geq 1$ cognitive function
  • Memory
  • Language
  • Executive abilities - planning, abstract thinking, organisation, conceptual shift
  • Visuo-spatial abilities
• Impairs daily function: occupational or social
• Exclusion – solely delirium, some psychiatric conditions (depression = pseudo-dementia)
Prevalence of dementia

- > 6% of population ≥ 65 years old
- 20% of persons ≥ 80 years
- 30% of ≥ 90 years old
- In Australia ≈ 330,000 people w dementia
- In 1000 GP practice, ≈ 200>65 → 10+ with dementia & ≈ >24 with pre-dementia (MCI)
  – Approx. 2 new dementia cases per year
Take history regarding cognition & function from informant

- Clinical history
- Interview informant, assess carer needs
  - See informant separately if possible
- Activities of daily living – dress, wash, toilet, teeth, shave
- Instrumental ADLs – cooking, shopping, meds, finance, transport, telephone, driving, safety
- More complex activities – bridge, languages
4. Assess cognition if any indication or suspicion of impairment

- www.dementia-assessment.com.au
- MMSE and Clock Drawing Test
- GPCOG www.gpcog.com.au
- RUDAS
- If uncertain repeat over time
GP diagnosis of dementia

- 74% of people consult a GP first after noticing symptoms of cognitive decline, and …
- 79% consider GPs to be easily accessible\(^1\)
- GPs are best placed to identify dementia early
- But, GPs do not diagnose about 50% (≤ 91%) of mild cases\(^2,3\)

\(^1\)Wilkinson et al (2004); \(^2\)Valcour et al *Archives Int Med* 2000;160:2964-8
\(^3\)Boustani et al *J Ger Int Med* 2005;20:572-7
The GPCOG website: A web-based assessment of cognitive impairment in the primary care setting

www.gpcog.com.au
Cognition (/9)
• Learn name, address (5 items)
• Date = 1 (exact)
• Clock numbers = 1
• Hands of a clock for 11.10 = 1
• Current event (detail) = 1
• Recall name and address = 5

9/9 → OK
<5 → impaired
5-8 → informant interview...
GPCOG: 6 informant questions
Compared to 5 years ago

More difficulty:
• Memory
• Word finding
• Recalling conversations

Less able to:
• Manage finances
• Manage transport
• Manage medications

If > 3 ‘Yes’ → impaired
...and realises that the 12 is missing
Draw in the hands to show 10 past 11 o’clock or 11.10
Other frontal tasks

• Tapping
  – When I tap once, I want you to tap twice
  – When I tap twice, I want you to tap once
• Explain proverbs – culture bias
• Verbal fluency: FAS, animals
• History – can’t follow movies, lack of anticipation, change in sense of humour, disinhibition, change in personality
• Interview – trouble understanding
Mental state and physical examination

• Look for specific conditions that mimic dementia (depression, delirium, drugs) or that can compromise cognition (eg cardiac failure, use of anti-cholinergic drugs)
• Check nutrition, hygiene, vision, hearing
• Check for causes of dementia
  – eg hypothyroidism, B₁₂ anaemia
Investigate causes of cognitive decline

• Rule out rare, but reversible causes eg Abnormal thyroid, calcium or Vit $B_{12}$, tumour. Normal pressure hydrocephalus, infection.

• See guidelines
Assessment: Routine Ix

- FBC, ESR or CRP
- Clinical chemistry including calcium
- Thyroid function tests
- B12, folate
- CT scan of brain (without contrast)
Investigations if indicated

- ECG
- CXR
- EEG
- micro-urine
- fasting glucose, lipids
- serology for HIV, syphilis
- neuropsychological Ax
- MRI
- SPECT
- PET scan
Diagnose cause

• Exclude depression and delirium
• Diagnose type of dementia
  – Type of dementia
    • 90% AD, vascular or mixed, then Lewy body and frontotemporal
  • Most pts. >80yo have mixed dementia (AD + VaD)
Assessment - The Practice

• History: crucial, especially from an informant

• Onset: sudden (e.g. vascular), insidious (e.g. AD)

• Progression: step-wise (e.g. multi-infarct dementia), gradual (e.g. AD).
Assessment (cont’d)

- Mental state examination - check cognitive functions of all lobes
  - Eg MMSE plus Clock Drawing Test
- Physical examination including neurological, cardiovascular, endocrine
Assessment - level and nature of current difficulties:

• Abstract, complex skills e.g. following a plan, learning language
• Instrumental activities of daily living (IADL), e.g. finances, telephone, transport
• Basic activities of daily living (ADL), e.g. dressing, washing, toileting.
QUESTIONS??
Behavioural and Psychological Symptoms of Dementia

BPSD
What are BPSD?

- Agitation
- Aggression
- Calling out/ screaming
- Disinhibition (sexual)
- Night time disturbance
- Shadowing
- Swearing
- Wandering

- Depression
- Anxiety
- Apathy
- Delusions
- Hallucinations
- Irritability
- Elation/euphoria
Why are BPSD important?

• Ubiquitous, >90% of PWD during course
• Distress to PWD and to caregivers
• Increase rate of institutionalisation
• Higher rate of complications in hospital
• Associated with:
  • Faster rate of decline
  • Increased mortality
Effects of BPSD

• Residents with BPSD are more likely to\(^1\):
  – be physically restrained
  – receive antipsychotic medication
  – negatively influence other residents

• BPSD increase the cost of institutional care for persons with dementia\(^2\)

• BPSD, especially aggression\(^3\) & calling out\(^4\), increase nurse stress

\(^1\)Maslow K 1994; \(^2\)O’Brien JA et al, 2000; \(^3\)Rodney, 2000; \(^4\)Draper et al, 2000
Aetiology of BPSD

- Biological
- Psychological
- Interpersonal
- Environmental
The bio-psycho-social framework
Biological causes - intrinsic

- Frontal pathology (behavioural disturbance, disinhibition, depression)
- Basal ganglia lesions (delusions)
- Temporal lobe (delusions, hallucinations)
- Locus coeruleus (psychosis, depression)
- Chemical changes – serotonin, NA, DA
- Genes – serotonin, dopamine receptors
- Family history of psychiatric disorder
Biological causes - extrinsic

- Acute medical illness
- Medication
- Pain syndromes
- Constipation
- Sensory impairments
- Fatigue
- Fears
- Basic needs (hunger, thirst...)
- Psychiatric syndromes
Before intervening ...

1. Is the description accurate?
2. Identification of target behaviour
3. Does behaviour require intervention?
4. Careful diary of behaviours
5. Exclude non-dementia causes
6. Correct sensory impairment - hearing, vision
The bio-psycho-social framework

Socio-environmental

Interpersonal

Biological

Psychological
How to intervene: Environment

- Modify environment rather than person
- Avoid too much or too little stimulation
- Adequate space
- Privacy available
How to intervene: Environment

- Secure grounds
- Personalised space
- Non-institutionalised environment
- Home-like

- Colour, furnishings, architecture
- Lighting
- Resident mix
- Size of residential facility
Enhanced Environment
Aroma therapy

Lavender

Lemon Balm

moderate evidence from Cochrane review
Pets, robotic pets, toys, dolls
The bio-psycho-social framework

- Socio-environmental
- Interpersonal
- Biological
- Psychological
Family caregivers

• Family carers as therapists for people living in the community
• Systematic review
  – Effect Size = 0.34 for decreasing BPSD
  – ES 0.15 for decreasing caregiver “stress”

Dementia Care Mapping & Person Centred Care for agitation

Cost for PCC
≈ $6 to reduce a point on CMAI

Chenoweth et al.
Lancet Neurology
2009
The bio-psycho-social framework

Socio-environmental | Interpersonal

Biological | Psychological
Psychological approaches to BPSD

- Music therapy
- Snoezelen
- ? Sensory stimulation

Useful during treatment but not long term

Calming music and/or hand massage

FIGURE 1. Mean agitation scores by treatment group over time. ● calming music; ■ hand massage; ▲ calming music and hand massage together; ⋆ control.

Remington, Nursing Research, 2002
Novel strategies

• Humour therapy
• Volunteers
• Music, singing, dance therapy
• Integrating kindergarten/ babies

Translating dementia research into practice
Humor therapy: SMILE study

- 20% reduction in agitation
- Effect size = antipsychotic medications for agitation
- Adjusting for dose of humour therapy
  - Decreased depression
  - Improved quality of life

Low LF et al BMJ Open 2013
Brodaty et al Am J Ger Psych 2014
Low LF et al JAMDA 2014
Key elements

- Engagement
- Understanding
- Time

Barriers

- Time
- Money
- Staff
- Attitudes
- Training
The bio-psycho-social framework

Socio-environmental  |  Interpersonal
---|---
Biological  |  Psychological
Pharmacological interventions
ChEIs & BPSD

• Some benefit, statistically significant in some reviews but questionable clinical significance

• Individual Sx may be more susceptible: apathy, hallucinations, aberrant motor behaviour, delusions, anxiety, depression

  - Trinh N-H et al, 2003
  - Rodda et al, 2009
  - Campbell et al, 2008
  - www.ipa-online.org
Memantine on BPSD

• Mixed results
  – Several negative results \(^1\text{-}^2\)
  – Some positive results \(^3\text{-}^4\)
• Specific benefits reported for cluster of aggression, hallucinations & delusions

\(^1\) Reisberg B et al, 2003; \(^2\) Van Dyck et al, 2007;
\(^3\) Tariot P et al, 2004; \(^4\) Gauthier et al (2005), IJGP, 20, 459-464
Antidepressants
Sertraline for treatment of depression in AD: Wk-24 Outcomes (DIADS-2)

- 67 Sertraline, 64 placebo; 12 wk RCT + 12 wk
- No between-groups diff. in depression response
  - in CSDD score
  - remission rates
  - secondary outcomes
- SSRI associated > adverse events of diarrhoea, dizziness, dry mouth, pulmonary SAE (pneumonia)

HTA-SADD Trial

N = 507

Banerjee S, HTA-SADD trial, Lancet, 2011
Effects of citalopram on BPSD

- Improve hallucinations & delusions (≠a’psychotics)
- Improve agitation
- 60% ↓ irritability and apathy (but n.s.)
- ↓ hallucinations (statistical; ?clinical significance)
- Prolong QT interval & worse cognition; ≤ 30mg/d

Anticonvulsants for BPSD

- Literature review of 7 RCT (2 carbamazepine & 5 valproate)
- Results (treatment vs placebo):
  - 1 study: sig. ↓ BPSD
  - 5 studies: no sig. difference
  - 1 study: sig. ↑ BPSD
  - AEs more frequent in treatment groups
- Might be beneficial for some patients
- Not recommended for routine use

Antipsychotics for ...

- Screaming X
- Wandering X
- Intruding into other people’s rooms X
- Aggression ?√ (but not first line)
- Delusions and hallucinations ?√ (but not 1st)
Continuing vs stopping neuroleptics in dementia patients?

- 12 months RCT
- Continuous use of neuroleptics vs placebo
- For most AD patients withdrawal had no overall detrimental effect
- Continuers – worse verbal fluency (p<.002) and higher mortality
- Subgroup of pts with more severe symptoms might benefit from continued Rx

Ballard et al 2008 PLOS Medicine, 5:587-599
The HALT study
Halting Antipsychotic use in Long-Term care
Analgesics

- Cluster RCT, 60 NHs, 352 residents, 8 + 4wks
- Mod-severe dementia, CMAI ≥ 39
- Stepped analgesia vs usual care
- ≈ 70% of residents paracetamol 1gm tds
- CMAI ↓17% (9.6 vs 3.4, p<.001)
- CMAI score ↑4 weeks after stop analgesia
- NPI & Pain scores significantly ↓

Husebo BS et al, BMJ, 2011;343:d4065 doi: 10.1136bmj.d0465
Legal consent for psychotropics

• Depending on jurisdiction a *Person Responsible* must give consent

• Survey of 3 NHs; 77 residents without capacity to give informed consent; on psychotropics¹

• Only 6.5% written consent

• + 6.5% partial or attempted consent

¹ Rendina N et al, 2009
Prevention of BPSD

- Person centred care and environment
- Right level of stimulation
- Attention to environment
- Treat physical disorders quickly
The NSW Dementia Behaviour Management Advisory Services (NSW DBMAS) is one of the many services provided by HammondCare – our passion is improving quality of life for people in need.

When behaviours impact the care and quality of life for people living with dementia, Dementia Behaviour Management Advisory Services (DBMAS) are there to help.

The HammondCare DBMAS program provides a state-wide service across NSW and is accessible through the national DBMAS number 1800 699 799. Callers will be connected with a consultant from our highly skilled multi-disciplinary team who will make an assessment about the intervention and recommendations required.

The NSW DBMAS program supports staff and carers, including family carers in the community, primary care settings with assessment, advice, short and medium term support.
Behaviour Management
A Guide to Good Practice

Managing Behavioural and Psychological Symptoms of Dementia
BPSD Guide

Behaviour Management - A Guide to Good Practice, Managing Behavioural and Psychological Symptoms of Dementia (BPSD)

- Restless/agitated behaviours
- Psychological/mood symptoms
- Psychotic symptoms
- Disinhibited behaviours

Aggression

Physically or verbally threatening behaviours directed at people, objects or self

- Presenting symptoms
- Contributing factors
- Differential diagnosis
- Assessment tools
- Conclusions
- Precautions
- Psychosocial/environmental interventions
**Agitation**

**Psychosocial/environmental interventions**

- **Acupressure**
  - Scientific quality of research: Moderate
  - Outcomes: Positive; 1 large & 1 small pilot study

- **Animal-assisted therapy**
  - Scientific quality of research: Limited
  - Outcomes: Positive; 1 small case series

- **Aromatherapy with lavender oil inhalation**
  - Scientific quality of research: Moderate
  - Outcomes: Positive; 1 study

- **Bright light therapy**
  - Scientific quality of research: Moderate
  - Outcomes: No benefit; 1 study *MAY INCREASE AGITATION*

- **Closing Group intervention, small group, resident driven program**
  - Scientific quality of research: Limited
  - Outcomes: Positive; 1 small study

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**Wandering**

**Clinical scenario**

**Presentation**

Mr E is a 63 year old Aboriginal man who moved to Adelaide from a regional community when he was 16. He lived with his wife until she died several years ago. While raising their family of five children, they maintained strong community links with Aboriginal friends and family in Mr E’s original community. His connection to Country has remained very important to him. Family and community members have been supporting Mr E in the family home with the assistance of an Aboriginal-specific community service and this arrangement has been working well until recently. On three occasions in the past month Mr E has been found after dark some distance from home, underdressed for the weather and distressed. On the most recent occasion, a concerned passer-by alerted police after Mr E was unable to provide his address or contact details for his family. When the police approached Mr E he became uncooperative and verbally aggressive. Police ultimately located Mr E’s daughter who collected him from the local police station to take him home.

**Assessment**

In order to reduce the presenting behaviour...
Clinical conclusions about management of BPSD

“Dr, Mrs Smith-Jones is hitting the nurses, disrupting the other residents and being impossible. Can you prescribe something?”
Clinical practice 1

- Ask nurses to monitor behaviours – what, when, what happens before, during and after?
- How often, when, what are precipitants?
- Exclude pain, UTI
- Determine cause
- Correct reversible factors eg stimulation level
- Start with psychological & environmental intervention(s)
  - except if urgent or sometimes concurrent
  - informed consent
II: Understand the person - Don’t just label the behaviour

- Why is this person behaving this way now?
- Aetiological map → management plan
- Different approaches often together
- Be creative
- Document
- Monitor outcome
- Partnership with family/carers
Clinical practice 2

- No cause can be found or correctable
- Try psychosocial treatments
  - not sure how?
  - BPSD Guide on your app
  - call DBMAS or local psychogeriatric team
- Psychosocial treatment fail
- Consider pharmacological treatment
- 1st need informed consent from patient or proxy (Person Responsible, Guardianship Act)
- Start low and go slow
Rx for BPSD - summary

- Cholinesterase inhibitors – for apathy
- Memantine - ?benefit for agitation/aggression/delusions/hallucinations
- Antidepressants – citalopram, sertraline, venlafaxine, mirtazapine
- Risperidone 0.5 - 2mg/day; modal = 1mg
- Olanzapine 5mg/day, up to 10mg/day
- Carbamazepine, valproate – titrate dose against response, SEs and blood level
- Analgesic stepped approach
Prescribing & Deprescribing Psychotropics

• Review regularly
  – At least after 3 months
  – Trial reduction, monitor behaviours

• Resident arrived from hospital on psychotropics
  – Find out why
  – If primary psychiatric diagnosis eg Sz, BAD
    → seek psychiatric review
  – If not, trial reduction after pt. settled
Summary ... d’oh!

- Drug treatments limited benefit and → side effects – yet 50% on ≥1 psychotropic and 30% of residents in Australia are on antipsychotics

- ≈ 90% of psychotropic Rx given without required consent¹

- Psychosocial and environmental therapies beneficial
  - effect size ≥ drug Rx

Rendina N et al, IJGP, 2009
Summary ... d’oh!

- So why are nursing homes not engaging more?

- Why is the knowledge not being translated into practice?
  - Training – too little?
  - Cost – too much?
  - Time – not enough?
  - Residents, families, system??
BPSD Conclusions

• BPSD common
• Prevent BPSD PCC, environment, titrate stimulation, CG and staff training
• Drugs have limited effects and AEs
• Psychosocial treatments have ↑ evidence
• Problem is implementation
• Practical suggestions for working with facilities
• Need policy recognition too – accreditation standards, government policy, research support
BPSD Conclusions

- Pharmacotherapy
  - modestly effective for BPSD
  - Prescribe judiciously
  - Need medico-legal informed consent
  - *Start low and go slow*
  - Importance of deprescribing
  - Review regularly, at least 3 monthly
    - Trial reductions
QUESTIONS??
Can we prevent dementia?

• The adult brain weighs about 1.3 kg
• Dementia shrinks it to 1/2 its usual size
Elimination vs Postponement

• Disease elimination
  – eg smallpox vaccination
  – best prospect is AD vaccine

• Disease postponement\(^1\): delay AD onset by…
  – 2 years, ↓ prevalence by 20%
  – 5 years, ↓ prevalence by 50%

\(^1\)Brookmeyer et al. (1998)
WHAT are we aiming to prevent: Dementia, AD, VaD, Mixed dementia?

- With ↑ age, % of pure AD, VaD or LBD ↓
- 80%+ of older people with dementia had CVD at post mortem
- In older people, mixed dementia > common than AD

¹ MRC CFAS Study (2003)
Is early life the most important target?

• 70% of world dementia in developing countries
  – Low foetal birth weight for gestational age
  – Poor or no education
  – Poor socio-economic environment

• 12.4% West Australia’s Kimberley Aboriginal people have dementia = 5.2x non-indigenous

Smith K et al, Neurology, 2008;71: 1470-1473
Cardiovascular Factors

The human heart
Leonardo Da Vinci
Blood Pressure (BP) and Dementia

- Mid-life hypertension associated with late-life dementia
- BP ↓ before dementia onset
- Hypertension Rx → risk ↓
- Each year of Rx → dementia risk↓
- 60% ↓ risk of all dementia and AD
- 5 RCTs conflicting results
- Can harm if lower BP too much in older old
As CVD risk factors accumulate, AD dementia risk increases

- If we count risk factors…
  - Hypertension
  - Smoking
  - Hypercholesterolemia
  - Obesity
  - Diabetes
  - Physical inactivity

Luchsinger et al 2005

Number of risk factors

Slide adapted from Michael Valenzuela
Statins to prevent AD

Mixed evidence
Use it or lose it?

Activities & AD
– Physical
– Cognitive
– Leisure
Questions

- Does exercise prevent dementia?
- Does exercise improve cognition and brain health?
- How does exercise work?
- What kind of exercise is best?

Slide courtesy of Prof Maria Fiatarone Singh
Exercise addresses risk factors for cognitive decline and dementia.
Physical activity = protective

- Several studies show physical activity protective against cognitive decline, dementia, Alzheimer’s, vascular dementia
- More is better – puffed, weights
- \( \geq 3x \) per week; \( >150 \) min/wk
- Check with your doctor

Physical activity

- Evidence from observational & control studies
- Physical activity benefits older adults to prevent dementia: Never too late to start
- Moderate intensity (brisk walking) 30 min 5d/wk
- No evidence for a specific exercise, but more than one type and more exercise may be better;
- Resistance training better in SMART Trial\(^2\)
- Combine with social and mental activity better?

Fiatarone Singh MA et al *JAMDA* 2014;15:873-80
Can aerobic exercise protect against dementia?

- Preserve cognition and slow cognitive decline
- Decreased incident dementia
- 8/11 RCTs in healthy older persons: cognitive & fitness improved
  - especially cognitive speed and attention
- Biomarkers increased e.g. brain volume
- Animal studies – growth factors increased, BDNF increased, neurogenesis increased, inflammation decreased, AD path decreased

Walking 150’/wk for cognition

mean difference on ADAS-Cog from baseline

- Exercise group
- Control group

6 mths
7 mths
12 mths
18 mths

Improvement
Decline

N = 138 memory complainers

Lautenschlager et al (2008) JAMA; 300(9):1027-1037
The power of physical activity

Erickson et al., 2011
What kind of exercise is best for your brain?

Memory improved with weight lifting but not aerobic exercise or stretching control.

EXCEL TRIAL 86 women, Mean age 75
Mild Cognitive Impairment at baseline
6 months exercise, 2x/wk

Slide courtesy of Prof Maria Fiatarone Singh
Dose of Exercise for Brain Health

- **Frequency**
  - 3-7 days/wk aerobic
  - 2-3 d/week resistance training

- **Volume**
  - 45-60 min/session
  - Sufficient to reduce body fat/metabolic health if that is a goal

- **Intensity**
  - **Fitness** outcomes proportional to intensity
  - **Fitness** outcomes proportional to brain/cognitive changes
  - → highest intensity feasible in given cohort

Slide courtesy of Prof Maria Fiatarone Singh
Mental Activity & Dementia

• Meta-analysis of 22 studies, 29,000 individuals
• ↑ complex mental activity in late life = ↓ risk of dementia by half; OR = 0.54 (0.49-0.59)

• Dose - response relationship evident

• Results suggest complex patterns of mental activity in the early, mid- and late-life stages are associated with ↓ dementia incidence

• Results held when covariates in source studies were controlled for

Cognitive interventions healthy older adults & people with MCI

- 20 RCTs with healthy adults
  - Memory improvements in 17/20
- 6 RCTs with MCI
  - Memory improvements in 4/6
- Unclear whether these improvements generalise to everyday activities

Cognitive training

• Systematic review of RCTs with longitudinal follow-up (>3mths) in healthy elderly\(^1\)
  – 7 RCTs met inclusion criteria, low quality
  – Strong effect size for cognitive exercise intervention vs wait-and-see controls
  – Longer FU duration (>2yrs) → ES no lower

• Review of cog. training or rehab in dementia\(^2\)
  – 11 RCTs, no benefit

Valenzuela & Sachdev (2009) Am J Geriatr Psychiatry 17(3)
Do leisure, mental or physical activity lower risk of dementia?

Or

Are those with better cognitive function and lower risk of dementia more likely to participate?

Or

Could prodromal dementia (pathology build-up before symptoms apparent) influence activities?
Mind your diet

- Mediterranean diet
- Antioxidants
What is Mediterranean diet?

• Abundant plant foods
• Fresh fruit as typical daily dessert
• Olive oil as principal source of fat
• Dairy products (cheese and yogurt)
• Fish and poultry - low to moderate
• 0-4 eggs week
• Red meat - low amounts
• Wine - low to moderate amounts
• Total fat = 25% to 35% of calories
• Saturated fat ≤ 8% of calories
Nutrition / Supplements

- Alcohol ? moderate
- Fish/Seafood/ω3 ?
- Vitamin D ?
- Caffeine ?
- Vitamin E ?
- Vitamin C x
- Folic acid, B<sub>12</sub>, B<sub>6</sub> ?√X

Food sources better than supplements
NSAIDs, fish, curcumin, HRT

- Anti-inflammatories – mixed epidemi. evidence
- Fish oil – some evidence (epidemiological)
- Curcumin – some evidence (laboratory)
- HRT – mixed evidence; maybe beneficial post oophorectomy & ?immediately post-menopausal
Smoking and AD

- Current smoking
  - Increase risk for AD
- Previous smoking
  - Risk not significantly increased

Anstey K. Am J Epidem 2008
Alcohol

• Some evidence benefit with moderate alcohol
  – i.e. abstinent → higher risk, j-shaped curve
• Not all studies confirm
• Interaction with ApoE4 – contradictory results?
• Heavy alcohol is risk factor
• Which alcohol – (red) wine?
  – Evidence not strong
• What is moderate?
Natural therapies

- Ginkgo biloba
- Turmeric, circumin
- DHA, omega 3
- Fo-ti root
- Soy isoflavone
- Vitamin E, Selenium
- Folate, B6, B12
- Saffron
- Brahmi
- Huperzine A
Unproven but popular on net

- Coconut oil
- Grain Brain
- Many others??
Environmental factors

• 30% of population attributable risk of AD cases from 7 environmental factors

• If 25% lower prevalence of these risk factors $\rightarrow$ 3 million fewer AD cases worldwide

• Highest estimated Pop$^u$ Attributable Risk for AD
  – Global: low education (19·1%, 95% CI 12·3–25·6)
  – USA: physical inactivity (21·0%, 95% CI 5·8–36·6)
  – Europe and UK similar (20·3%, 5·6–35·6)

Barnes & Yaffe, 2011; Norton et al, 2014
How much AD can be attributed to environmental factors?

- 2% diabetes mellitus (type 2)
- 2% midlife obesity*
- 5% midlife hypertension
- 10% depression
- 13% physical inactivity*
- 14% smoking
- 19% cognitive inactivity/education#

Barnes & Yaffe, 2011
FINGER study

- Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER)
- First large, long term RCT of multi-domain interventions aimed at improving cognition
- Eligibility: 60-77 yrs, CAIDE dementia risk score ≥6; cognition at or slightly below mean for Finnish norms (eg, ≤ 26 MMSE)

Ngandu et al. The Lancet. 2015; http://dx.doi.org/10.1016/S0140-6736(15)60461-5
Finger intervention

- Diet
- Cognitive training
- Exercise – PMR and aerobic
- Manage metabolic and vascular risk factors
- Social activities
Mean change in cognition over 2 years

NTB Total Score

Executive Function

http://dx.doi.org/10.1016/S0140-6736(15)60461-5
Mean change in cognition over 2 years

Processing speed

- Baseline
- 12 mths
- 24 mths

Memory

- Baseline
- 12 mths
- 24 mths

http://dx.doi.org/10.1016/S0140-6736(15)60461-5
Can AD be prevented? Not yet, but ... may be delayed

- Look after your heart
- Be physically active
- Mentally challenge your brain
- Follow a healthy diet
- Enjoy social activity
Centre for Healthy Brain Ageing

https://cheba.unsw.edu.au/

Our vision is to achieve, through research, healthier brain ageing and better clinical care of age-related brain diseases
• Prevention trial, NHMRC funded, 5 years
  – Internet based, largest trial in world
  – 18,000 Australians 55-75 years old
  – Exercise, cognitive training, diet, blood pressure, cholesterol, glucose, depression
  – Tailored to individual risk factors

www.cheba.unsw.edu.au
Thank you
Questions??

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