The Sydney Centenarian Study
Centre for Healthy Brain Ageing
University of New South Wales
Sydney Centenarian Study: Aims

• Establish a cohort of centenarians and near-centenarians to explore the genetic and environmental factors that underpin successful ageing.

• Specific aims:
  • Determine the prevalence of major medical and neuropsychiatric disorders in the oldest old, including prevalence of dementia.
  • Validate and/or establish tools for the valid assessment of cognitive function in the oldest old.
  • Examine the genetics, brain structure and neuropathology of the oldest old.
  • Explore the care needs, quality of life, physical and mental health, and degree of functional independence of the oldest old.
Sydney Centenarian Study: Recruitment

Multiple and exhaustive recruitment strategies in an effort to identify all >95yo Australians within our catchment area to establish as representative a cohort as possible.

- Targeted mailouts utilising Department of Human Services (i.e. Medicare) roll.
- Aged-care facilities.
- Public health forums and seniors events.
- Media
- Word-of-mouth
Sydney Centenarian Study: Assessment Protocol

Baseline Assessment (n=410)

- Demographics
- Lifetime medical history + current medications
- Family medical history
- Cognitive assessment
- Premorbid intellectual functioning
- Mood
- Subjective memory complaints
- Falls
- Diet
- Physical activity
- Mental activity
- Social network

Physical exam
- Vitals
- Vision
- Walking speed
- Balance
- Grip strength
- Spirometry

Informant interview:

- Demographics
- Corroborate participant medical history
- Corroborate family medical history
- Activities of daily living (self care)
- Instrumental activities of daily living (functional independence)
- Cognitive decline
- Health service utilisation
- Apathy
- Neuropsychiatric symptoms
Sydney Centenarian Study: Assessment Protocol

6 monthly follow-up assessments:

- Interval medical history medical history + current medications
- Cognitive assessment
- Mood
- Subjective memory complaints
- Falls
- Diet
- Current physical activity
- Current mental activity
- Current social network

- Physical exam
  - Vitals
  - Vision
  - Walking speed
  - Grip strength
  - Spirometry

Informant interview:

- Corroborate interval medical history
- Activities of daily living (self care)
- Instrumental activities of daily living (functional independence)
- Cognitive decline since last assessment
- Health service utilisation
Sydney Centenarian Study: Assessment Protocol

Bloods (n=262)
- DNA/RNA
  - Genotyping
  - Whole genome sequencing
  - Gene expression
  - Epigenetic assays
  - Storage of serum and plasma for future proteomics and lipidomics work
- Clinical chemistry
  - Glucose and lipids
  - Kidney function
  - Haemoglobin and WBC
  - Urate
  - Electrolytes
  - B12
  - Folate

Brain donation (n=10)

Brain imaging – MRI (n=43)

MRI brain scan of a 101yo female participant with dementia showing (a) moderate generalised brain atrophy and (b) extensive white matter hyperintensities [1]
Sydney Centenarian Study: Baseline Demographics

- **Gender Distribution**: 29% Female, 71% Male
- **Language Background**: 26% English speaking, 74% Non-English speaking
- **Residential Status**:
  - Community: 39%
  - Aged Care: 61%
- **Age at Baseline**:
  - 95yo: 119
  - 96yo: 107
  - 97yo: 55
  - 98yo: 46
  - 99yo: 37
  - 100+: 46
- **Age Range**: 95.02y – 106.3y
- **Mean Age**: 97.40y (SD 2.07)

N=410
Sydney Centenarian Study: Years of Education

- Years of Education
  - Mean: 10.02y (SD 3.12)
  - Range: 0-23y

- 34.5% completed high school
- 12.5% completed university studies
Sydney Centenarian Study: Dementia

- Each participant is reviewed by a ‘consensus’ panel to determine whether they meet criteria for dementia.
- Panel includes:
  - Neuropsychiatrist
  - Old-age Psychiatrist
  - Neuropsychologist
  - With input from other study staff
- Consensus review takes into consideration:
  - Performance on cognitive tasks
  - Informant report of cognition and functional independence
  - Medical history
  - Mood
  - Physical frailty
  - Subjective memory complaints
  - Detailed notes from Research Assistant
  - MRI report (if available)
Sydney Centenarian Study: Dementia vs Non-Dementia

Mean MMSE (/30)

- Dementia: 15.64
- Not Dementia: 25.62

Mean ACE-R (/100)

- Dementia: 45.35
- Not Dementia: 74.28
Sydney Centenarian Study: Dementia vs Non-Dementia

**Age at Baseline**

- 95: 20.18%
- 96: 35.58%
- 97: 40%
- 98: 47.73%
- 99: 47.06%
- 100+: 45%

**Education**

- Years: 0, 2, 4, 6, 8, 10, 12, 14, 16
- Dementia: 9.23 ± 1
- Not Dementia: 10.46 ± 1

**Living in Aged Care**

- % with Dementia: 65.93%
- % Not Dementia: 23.9%
Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL’s)?

- Completely Independent
- Minor assistance or special preparation of food
- Requires moderate assistance
- Requires extensive assistance

Of those living in the community, only 13.4% of participants required assistance with eating and/or special preparation of meals.

Of those living in aged care, 38.6% required special preparation of meals and/or some level of assistance with eating.
Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL’s)?

- No assistance: 58%
- Minor assistance: 19%
- Moderate assistance: 11%
- Extensive assistance: 12%

Of those living in the community, 29.6% of participants required at least minor assistance with dressing and/or clothes selection.

Of those living in aged care, 62.8% required at least some level of assistance.
Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL’s)?

- Well groomed without assistance: 53%
- Occasional assistance: 19%
- Regular assistance or supervision: 10%
- Needs total grooming care: 18%

Of those living in the **community**, 35.5% needed some level of assistance with grooming.

Of those living in **aged care**, 65.8% required some level of assistance or supervision with grooming.
Sydney Centenarian Study: ADLs

How independent are the oldest old with activities of daily living (ADL’s)?

Of those living in the community, 22.5% needed at least some assistance with bathing/showering.

Of those living in aged care, 64.9% required assistance with bathing/showering.

- No assistance: 62%
- Help getting in/out: 10%
- Can only wash hands/face: 6%
- Cannot wash self at all: 22%
Sydney Centenarian Study: Mobility

How mobile are the oldest old?

- 63.5% of our participants can ambulate without assistance from others (although most rely on a walking stick or walking frame), with almost half of these able to walk more than a block's distance.

- 22.5% of our participants can walk at least a short distance with the assistance of others.

- 14% of our participants are restricted to a wheelchair or are bed bound.

Of those that can ambulate more than a block (29.4% of the sample)

- 30% reported they walk more than 4x each week for exercise

- 34% reported they go for a walk 1-3x weekly for exercise

- Our participants reported that they walk for an average of 30 minutes each time they exercised
Sydney Centenarian Study: Mental Health

Kessler Psychological Distress Scale (K-10)

- 10-15 = Low risk
- 16-29 = Medium risk
- 30-50 = High risk

... of having an anxiety or depressive disorder [2]
What do participants think is the most important factor for longevity?

The most important factor for longevity (% of cohort):

- Physically active: 34.2%
- Strong relationships: 17.6%
- Nutrition: 13.3%
- Genetics: 10%
- Minimising stress: 7.3%
- Work/Career: 5.6%
- Religion: 5.6%
- Avoiding smoking: 3.3%
- Avoiding alcohol: 3%
Sydney Centenarian Study

What has been the secret to your long life?

- “I’ve never had takeaway food in my life.”
- “Genes. And some luck… actually a lot of luck”
- “Self-discipline. Never allow yourself to collapse”
- “Work hard. Work is not a punishment. Find your place in the world and if you don’t enjoy it, don’t do it”
- “Lemon juice every morning”
- “It just happened. I can’t believe I lived so long”
- “Always obeying your doctors orders”
- “Never get jealous and don’t worry about what others have”
References

