

# Alcohol and Other Drugs and the Ageing Brain

Conjoint Professor Brian Draper  
Prince of Wales Hospital, Randwick

# What is old for substance misuse?



# What is old?

There is no single age cut-off that captures the different older populations with substance misuse disorders

Aged Care Services      75+      mainly prescription drugs

Mental Health Services      65+      mainly alcohol & prescription drugs

Drug & Alcohol Services      50+      alcohol, illicit & prescription drugs

General Public      ??      alcohol, illicit & prescription drugs

# Geriatric ‘Giants’

- Immobility – (frailty)
- Intellectual impairment - (dementia, 9% age 65+)
- Instability – (falls)
- Incontinence
- Iatrogenic – (polypharmacy)

# Incidence of Dementia with Age

(WHO, 2012)

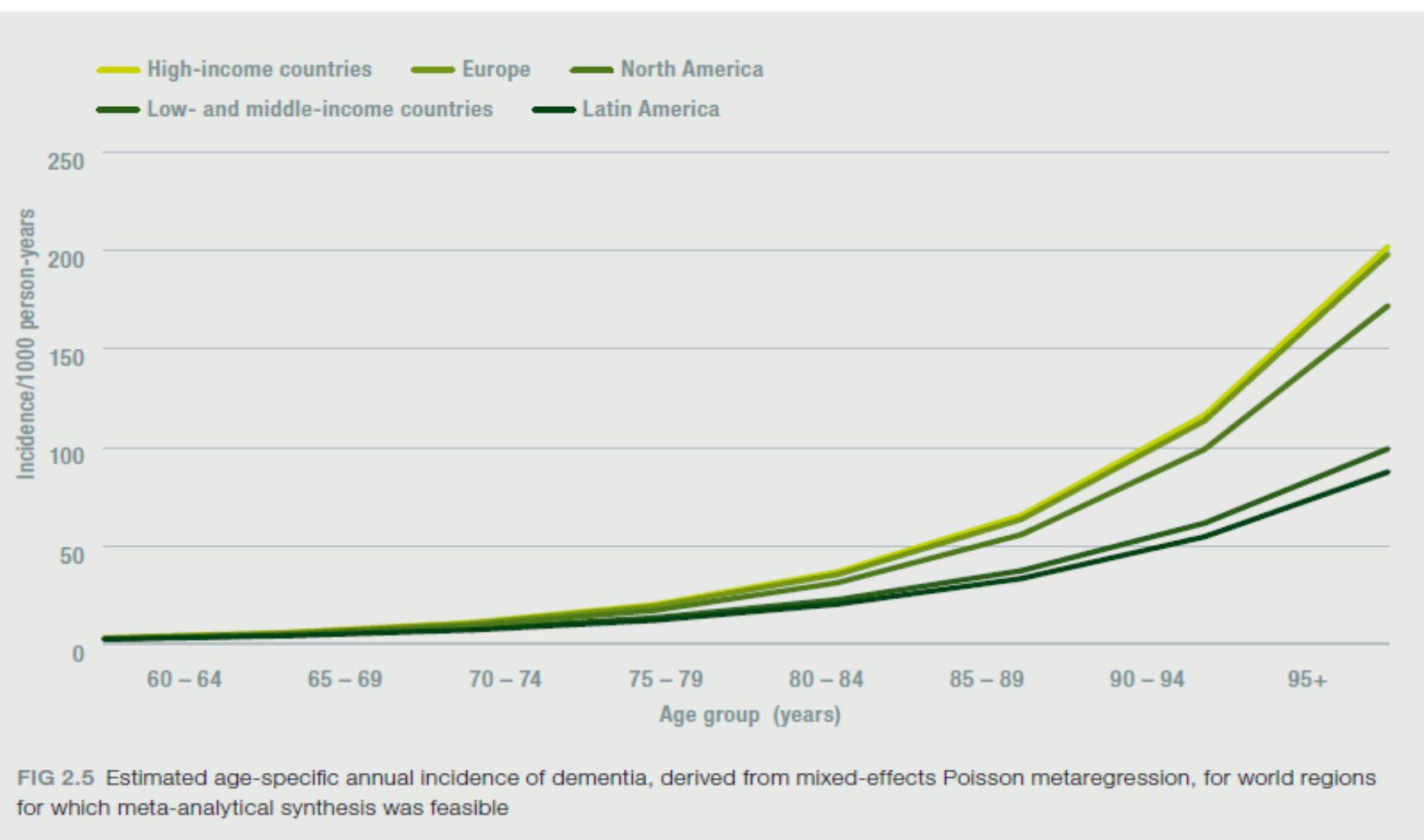


FIG 2.5 Estimated age-specific annual incidence of dementia, derived from mixed-effects Poisson metaregression, for world regions for which meta-analytical synthesis was feasible

# Age Effects, Drugs and Health

## Older People:

- Respond to medications differently
- Medications take longer to excrete/ metabolise
- Effects of medications can be drastically different (comorbidities)



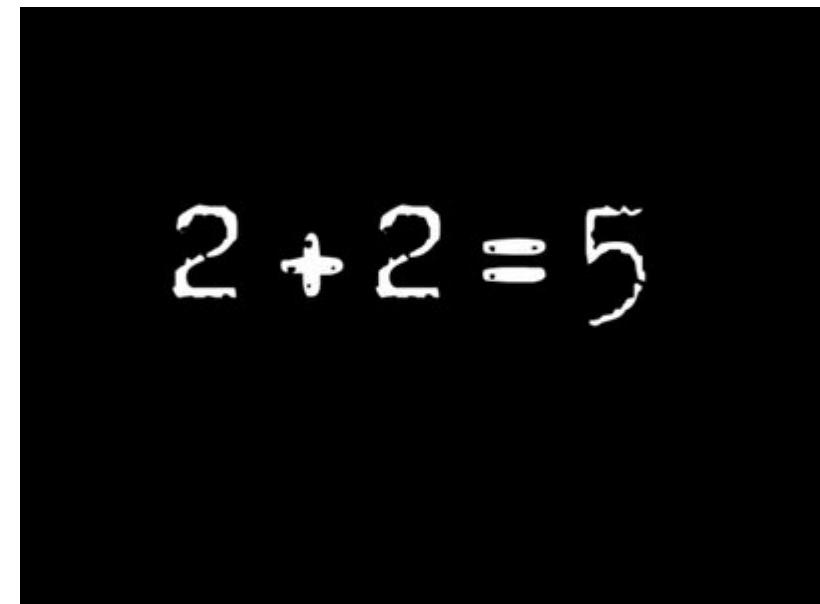
# Why does this matter to older people with alcohol and substance use disorders?

Synergistic increase in risk

Earlier development of ‘geriatric giants’

Need to recognise the unique needs of geriatric patients

Unusual to find only one specific cause of an acute presentation



# Alcohol consumption in older age



Physiological changes impact tolerance

- Less does more - older adults have a higher sensitivity to alcohol and a decreased ability to metabolize it effectively
- Thus the amount of alcohol that might cause short term risk is much less in older people but exact reduction is unclear and may depend on comorbidities

UK Guidelines define the upper ‘safe limit’ for older people as 1.5 units per day or 11 units per week

Binge drinking is defined as >4.5 units in a single session for men and >3 units for women

# Health Benefits of Low-to-Moderate Alcohol Use



J or U shaped relationship between alcohol use and health outcomes

Evidence from epidemiological studies that low to moderate use (2-3 standard drinks per day) may be beneficial

Increased longevity perhaps mediated by circulatory benefits

Reduced risk of dementia – perhaps additional benefit of flavonoid antioxidants – Meta-analysis of 15 prospective studies of persons aged 60+ found no evidence that heavy consumption of alcohol increased dementia risk (Anstey et al, 2009) - but recent research questioning this in older women (Hoang et al, 2012)

# Uncertainty about what is beneficial and harmful consumption in older people

Balance between amount where potential benefits and potential harms occur in late life is delicate

Current Australian data on what is safe/unsafe drinking in older people may underestimate short term risk

Long term risk only declines in a noticeable way over age 70, long term risk in 50-70 year olds is similar to 30-50 year olds

Clinicians are uncertain about how much alcohol consumption is a reasonable (and perhaps beneficial) level in older people and how much is harmful

# Issues of Comorbidity

- Comorbidity increases with age in the general population
- In those with Alcohol Use Disorders, comorbidity may be a precipitant, a consequence or coincidental
- Alcohol increases the risk of:
  - Hypertension, Stroke, Cardiopulmonary disease
  - Gastrointestinal disorders, Hepatic disorders
  - Falls → sense of balance, peripheral neuropathy
  - Sleep disorders
  - Malnutrition
  - Cancer – mouth, stomach and liver
  - Depression, suicide, psychoses, cognitive disorders

# **Prince of Wales Substance Use in Aged Care Study (Draper et al, 2014)**

210 English-speaking participants aged 60+ in Aged Care Services – mean age 82 years (range 60-98), 63% female, 15.2% NESB, 51% lived alone, 46% widowed

## **Patients with dementia, acute delirium excluded**

55% of potential participants excluded due to cognition, acute illness or poor English

82% eligible patients participated

# Prince of Wales Substance Use in Aged Care Study (Draper et al, 2014)

**Screen Positives** N=41 (19.5%) – 66% Female

**Alcohol** N= 36 (17%)

16 were drinking  $\geq$  3 std drinks daily – (81% male)

**Sedatives/Hypnotics** N = 4 – 3 chronic BZ abusers (> weekly use), one with accidental OD

**Opiates** N= 2 – only one chronic abuse

**Polysubstance** N= 4 all females with alcohol and BZ

**Screen Positive** – less likely to be NESB

**otherwise NO demographic, cognitive, mood or health differences from screen negatives**

# Alcohol, Depression and Suicide

- Older adults report drinking to reduce pain, because of a meaningless life, mental disorders, anxiety, depression, loneliness and sleep problems
- Suicide risk increased with comorbid alcohol/substance misuse – mainly in midlife but also late life
- Psychological Autopsy in Brisbane & Sydney 2006-8  
261 suicides aged 35+, 73 aged 60+  
29% suicides (36% 35-59s, 14% 60+) had a **substance use disorder**
  - 22% suicides had **alcohol abuse**, 18% **other substances** (De Leo, Draper et al, 2013)



# Issues with Late Onset Alcohol Use Disorders

- About 33% commence in late life
- Common precipitants include:
  - Difficulties in adjusting to retirement – boredom etc
  - Bereavement – especially spousal
  - Depression
  - During early stages of dementia
- Problems with identification:
  - Families often unaware of what is happening
  - Gradual evolution from normal to abnormal drinking
  - Cognitively impaired forget what they have drunk
- Management issues – deal with the precipitants

# Alcohol and Acute Cognitive Disorders

Alcohol may cause a cognitive disorder or be associated with other cognitive disorders

- Acute disorders with symptoms of confusion, agitation, sleep/wake disturbances & hallucinations etc can be due to:
  - Intoxication,
  - Alcohol withdrawal and/or Delirium Tremens,
  - Wernicke's Syndrome (due to thiamine depletion)
  - Delirium associated with other illnesses
- These are medical emergencies with high rates of morbidity & mortality. Wernicke's Syndrome needs urgent IV thiamine replacement

# Wernicke-Korsakoff Syndrome (WKS)

- Due to severe thiamine ( $B_1$ ) deficiency - also after persistent vomiting, hunger strikes, anorexia nervosa, obesity surgery
- The acute syndrome is Wernicke's Encephalopathy
  - Diagnosis requires at least two of the following four signs: dietary deficiencies, eye signs (nystagmus being probably the most frequent), cerebellar dysfunction and altered mental state or mild memory impairment
- Only 20% of patients WE are identified prior to death
- Untreated, it leads to death in up to 20% of cases or to the Korsakoff syndrome in 85% of survivors

# Alcohol and Chronic Cognitive Disorders

Chronic cognitive disorders due to alcohol - generally 2 types:

- i) Alcohol-related dementia (ARD)
- ii) Wernicke's Korsakoff Syndrome (WKS)

There is much overlap and many simply lump them together as Alcohol-Related Brain Damage (ARBD)

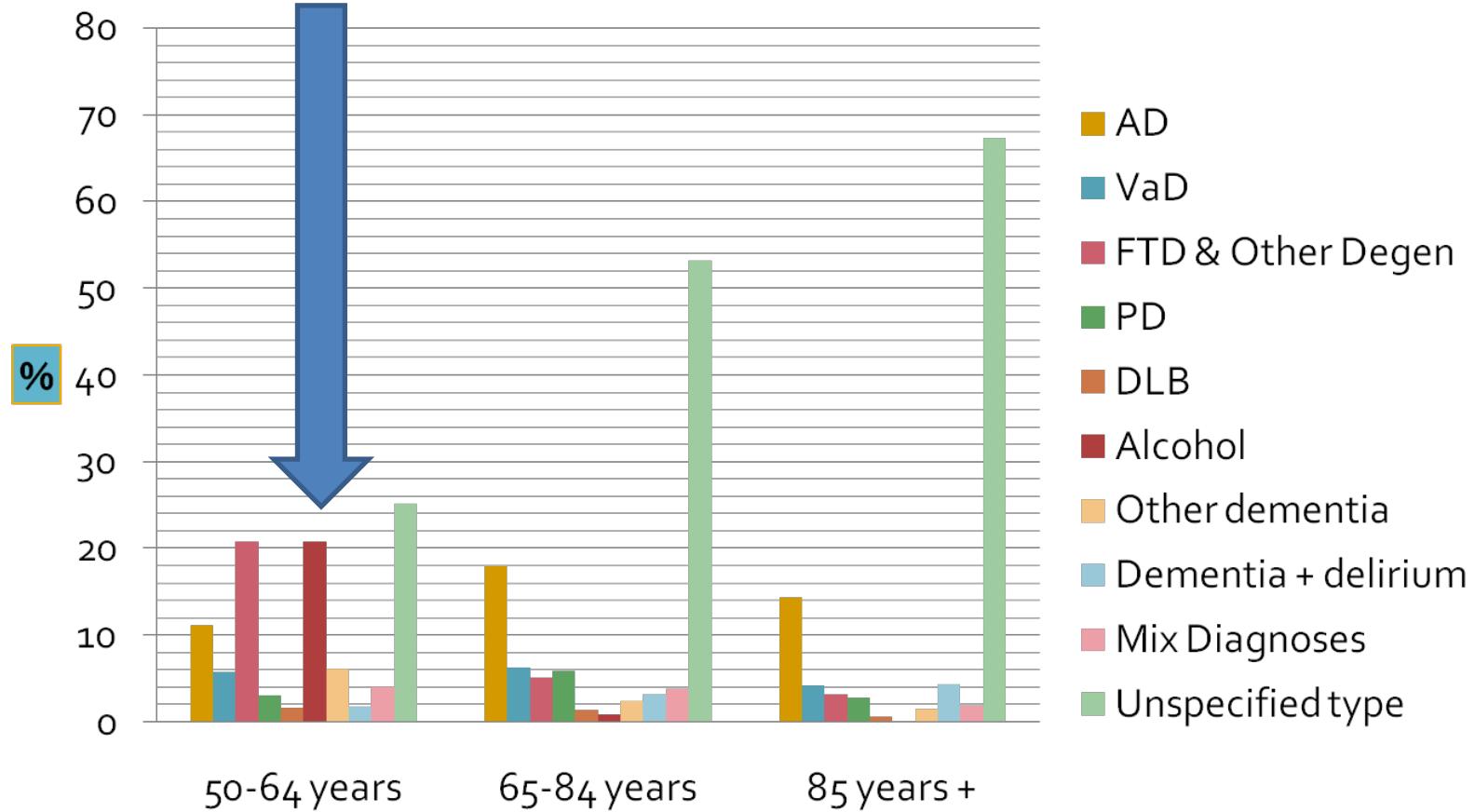
These tend to mainly occur age 40-70

Aged 70+, cognitive disorder is mainly due to another condition e.g. vascular dementia, Alzheimer's disease

Alcohol use is a comorbidity that complicates management, increases risk of acute hospital admission by 500% (Draper et al, 2011)

# Dementia Diagnoses by Age

## NSW Hospitals 2006/7 (Draper et al, 2011)



# Identifying Cognitive Disorder in People with Alcohol and Substance Misuse

- a) Misattribution of frontal apathy to depression in chronic abusers – either no cognitive screen or use of a screen (e.g. MMSE) that does not detect frontal disorders – MoCA is better but no clear cut-offs
- b) Difficulties in getting accurate collateral history – limited family support, other agencies
- c) Important not to prematurely diagnose dementia in someone acutely intoxicated
- d) MH & physical comorbidity may affect cognition

# Challenges with Alcohol-related Cognitive Disorders

- High rates of behavioural disorders especially aggression
- High rates of injuries – falls, head injuries, self-harm
- Community management difficult, limited informal support – often ARBD diagnosis not made until RACF placement
- Few RACFs suited – young (50-70 years) aggressive males not well catered for
- ARBD/ARD diagnoses stigmatising

Long Term Outcomes – ARBD may recover  
Impairment not degenerative if abstinence and  
good nutrition maintained e.g. over 2 years  
only AD & VaD declined in nursing home,  
ARD stabilised (Oslin & Cary, 2003)

Recovery thought to be split into quarters

- 25% complete recovery
- 25% significant recovery
- 25% slight recovery
- 25% no recovery (Smith & Hillman 1999)

# Non-medical Pharmaceutical Use

## 2010 National Household Survey

Range: sharing medications, higher doses, or longer durations than prescribed, to persistent abuse and dependency issues.



Main: benzodiazepine sedative-hypnotics and the opioid analgesics

(AIHW, 2011)



# Benzodiazepines (BZ)



Benzodiazepines should be avoided in older adults because of residual sedative effects and an association with falls, MVAs, overdoses, and worsened memory

Mainly prescribed for sleep, anxiety & stress – often these are due to underlying depression

Withdrawal risks: Seizures, Tremors, Hallucinations, Delirium,

# Benzodiazepines and Cognition in Late Life

The long term effects of benzodiazepines upon cognition are mixed but mainly suggestive of increasing risk of cognitive impairment (Stewart 2005)

Longitudinal studies indicate chronic Bz consumption can increase risk of cognitive decline (e.g. Paterniti et al, 2002) & dementia (e.g. de Gage et al, 2012)

The extent to which Bz are associated with Mild Cognitive Impairment (MCI) are unclear

In Sydney Memory & Ageing study, exposure to benzodiazepines in the 2 years before baseline was associated with increased risk MCI (Draper et al, unpublished)

# Opioids

Risk for opioid-related problems has increased over the past 10-years for all birth cohorts

Older people (mainly late mid life) misusing painkilling medication have driven the first rise in deaths from heroin and other opioid drugs in more than 10 years

Increased use of opioids in chronic pain management including nursing home residents with dementia and disturbed behaviour

Deaths from opioids increased from 500 in 2008 to more than 700 in 2010, only 30% due to heroin (NDARC, UNSW 2012)



# Opioid Use and Cognition in Mid-life

125 opioid maintenance subjects, 50 abstinent ex-users and 50 controls compared on domains of neuropsychological functioning

Mean age in mid 30s, two-thirds male

Those on maintenance therapy had impairments in executive function, information processing, verbal & non-verbal learning

Type of maintenance therapy (methadone vs suboxone) did not have an effect on cognition

(Darke et al 2012)

# Risk Factors for Opioid Misuse in Older People

Cross-sectional study from 11 VA outpatient clinics, 163 patients (69% male) being treated for chronic pain with opioid medications – mainly for arthritis & lower back pain

High levels of pain severity & depressive symptoms, lower disability scores were associated with increased risk of opioid misuse as measured by Pain Medication Questionnaire

No association with alcohol problems, social supports, social networks or spirituality

Park & Lavin (2010)

# **Health Needs & Services of Older Drug & Alcohol Clients**

**(Lintzeris et al in press)**

99 subjects (77% male) from SE Sydney D&A services  
aged 50+ (mean 55 years; range 50-71)

64% live alone, only 7% with partner

7% employed, 79% unemployed/perm. unable to work

Opiate dependence n = 69 (70%)

– 70% on methadone, 30% suboxone

Alcohol dependence n = 30 (30%)

Many were polysubstance users (esp those with opiate dependence) – 40% benzodiazepines, 38% cannabis, 10% amphetamines, 5% cocaine

# Comparison of cognition by substance

	Methadone (n = 49)	Suboxone (n = 20)	Alcohol (n = 30)	p value
MMSE / 30	27.59 (2.51)	27.60 (2.80)	27.87 (2.29)	.776
ACE-R /100	80.78 (9.23)	86.85 (7.16)	82.20 (10.86)	.036

- Follow up pairwise comparisons for ACE-R total score (Bonferroni corrected) revealed statistically significant differences between the methadone and suboxone groups ( $p = .03$ ), but no other significant differences between groups
- Suboxone group had higher ACE-R scores than the methadone group
- No differences in groups in age ( $p = .675$ ); or gender ( $p = .693$ )

# Predictors of Cognitive Impairment

- Treatment group, gender, age, activities of daily living score (Bayer), depressive symptoms (Geriatric Depression Scale), history of head injury were entered as predictors of overall cognitive function (ACE-R total) in a stepwise regression model (backwards elimination)
- Treatment group (suboxone) and GDS score were the only significant predictors remaining in the final model, however this model only accounted for a small proportion of variance (*Adjusted R<sup>2</sup>* = .124)
- ACE-R total score had a significant negative correlation with GDS symptoms,  $r_s(98) = -.252$ ,  $p = .012$

# Long Term Effects of Cannabis Use

adapted from Hall (2014)

Condition	Evidence	Level of Evidence	Strength of Effect
Dependence	+++	Cohort studies	1 in 10 users
Education outcome	++	Cohort & Case Control	2x in regular users
Cognitive impairment	++	Cohort & Case Control	Difficult to quantify
Psychosis	++	Cohort studies	2x in regular users
Depression	+?	Cohort studies	Confounded
Suicide	+?	Cohort studies	2x in regular users
Chronic bronchitis	++	Cohort studies	2x in regular users
Cardiovascular	++	Cohort & Case Control	3-4 times in MI
Testicular cancer	++	Case-control	2-3x
Respiratory cancer	+?	Case-control	Confounded by smoking

# Long Term Effects of Cannabis Use

Most research has focused on people who are in midlife and have been using since adolescence or early adulthood

Unclear whether the reported long term effects are amplified in later life

From a psychiatric perspective, in the US reports of comorbid cannabis use in older people with depression

e.g. 12% depressed & 4% depressed women aged 60+ in a psych OP clinic had used cannabis in previous 30 days, with higher scores on BDS associated with cannabis use (Satre et al, 2011)

# Cannabis and cognition in older people

There is mounting evidence that long-term cannabis use has deleterious effects on attention & memory

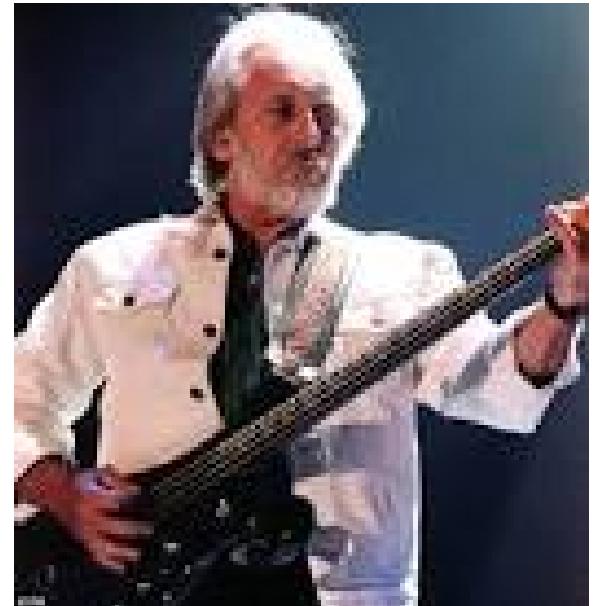
Impairment appears to increase with earlier age of onset, dose, frequency & duration of use. Studies thus far are methodologically poor & really only extend to midlife

However, 12-year follow up of heavy, light & non-users in ECA study – no effects noted on MMSE in persons under 65 (Lyketsos et al, 1999)

Other studies have found cognitive impairments but attribute them to personality factors (Meier et al, 2012) or comorbidities (Sanchez-Torres et al, 2013)

# Health Effects of Cocaine

- Disturbances in heart rhythm, heart attacks, chest pain, respiratory failure, strokes, seizures, headaches, and GIT complications.
- Snorting cocaine can lead to loss of the sense of smell, nosebleeds, problems with swallowing, hoarseness, and chronically runny nose.
- Ingesting cocaine can cause severe bowel gangrene due to reduced BF.
- People who inject cocaine can experience severe allergic reactions and are at increased risk for contracting HIV, viral hepatitis and other blood-borne diseases.
- Cocaine-related deaths are often a result of cardiac arrest or seizure followed by respiratory arrest.

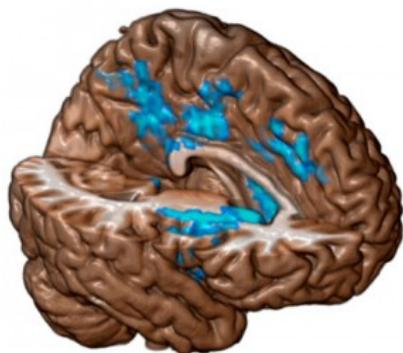


**John Entwhistle of The Who  
died of a cardiac arrest age 57  
while intoxicated with cocaine**

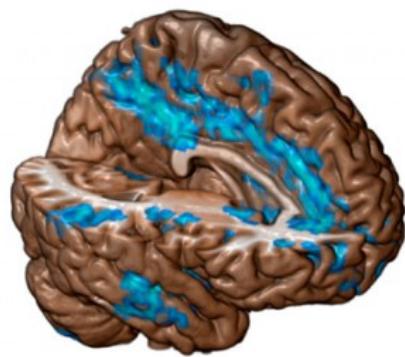
# Cocaine May Age the Brain

- Cocaine abusers in their 30s and 40s show brain changes more commonly seen in people over 60.
- among cocaine users, the rate of shrinkage was almost twice that of the non-drug-using group

(Ersche, 2012)



Healthy brain ageing



Cocaine users aged 30-40

# Conclusions

Chronic substance misuse akin to premature ageing hence in D&A populations 'old' often begins around age 50

Alcohol related brain damage most common in 50-70 year olds

In older age groups the extent to which alcohol and other drugs cause cognitive impairment, depression and physical health problems as opposed to exacerbating primary cognitive, mood & physical disorders is unclear

In geriatric health care identification & management of all potential contributing factors to health presentations is the key

Thank you..... •

Any questions?

Brian Draper:

[b.draper@unsw.edu.au](mailto:b.draper@unsw.edu.au)



## Alcohol and the Adult Brain

Edited by JENNY SVANBERG,  
ADRIENNE WITHALL, BRIAN DRAPER  
and STEPHEN BOWDEN

