



Dementia Training **Australia**

# Physical Comorbidities of Dementia

Dementia Series 2017

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Original Presentation by Prof Susan Kurrle

**Funded by the Australian Government**



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DTA provides a national approach to accredited education, continued professional development and on-site support for health and aged care staff caring for people with dementia.

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# Physical Comorbidities of Dementia

## MODULE 1

### Falls, Epilepsy & Oral disease

Rehabilitation and Aged Care  
Hornsby Ku-ring-gai Hospital

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# Physical Comorbidities of Dementia

- **Comorbidity:**
  - condition or disease that coexists with another disease, and has a probable pathological link to that disease, and occurs more often in that disease
- **Aim of project:**
  - To conduct a literature review on the physical comorbidities of dementia
  - To develop recommendations based on the findings of the review

# Physical Comorbidities of Dementia

- Over 3800 articles reviewed
- Selected comorbidities for review:
  - falls
  - epilepsy
  - delirium
  - frailty
  - malnutrition
  - gum disease/dental disease
  - visual impairment
  - sleep disorders
  - incontinence



# Falls in dementia



- Fall: “inadvertently coming to rest on the ground or other lower level”
- Annual incidence of falls in cognitively impaired populations is 70-80% i.e. double that of the normal population
- Fractures are seen up to 3 x more in people with dementia
- Hip fracture is 3 x higher, and patients with dementia are 3 x as likely to die in the first 6 months



Shaw, F.E. *Clinics in Geriatric Medicine* (2002)

# Falls in dementia

- Gait abnormalities are more common in people with dementia especially Vascular Dementia(VaD), Dementia with Lewy Bodies (DLB), Parkinson's Disease with Dementia (PDD)
- Psychotropic drug use is more common in people with dementia, leading to falls
- Orthostatic hypotension is more common in dementia particularly DLB and PDD
- Postural instability more common in dementia

# Factors contributing to falls in dementia

- Impaired executive function and motor planning skills
- Reduced attention span
- Impaired visuospatial skills
- Unrealistic perception of motor abilities
- Impulsivity
- Risk taking behaviour





# Management of falls risk

- No interventions proven to prevent falls specifically in people with dementia
- Multifactorial interventions in residential care may have an effect on residents with dementia
- Use of restraints very likely to worsen falls
- No evidence to systematically screen people with dementia for falls risk but probably sensible to intervene opportunistically to modify risk

# Case Study #1

An elderly lady with dementia was admitted to the emergency ward, following a nasty fall. The family provided the following details; The had taken Mum to view a residential low care room, Mum was not convinced she needed care and to demonstrate her point, she attempted a handstand in the car park, which resulted in bilateral fractured wrists and facial lacerations. This case highlights, a lack of insight, and impulsivity.



# Recommendations

- Review medications, decrease psychotropic medication where appropriate
- Assess and treat orthostatic hypotension
- Treat cataracts
- Consider simple strength and balance training exercises, environmental modifications, fall alarms, hip protectors, helmets
- Consider Vitamin D and calcium supplements, and bisphosphonates if low BMD or previous fracture

# Key Points - Falls

- Falls occur in people with dementia at twice the rate of the normal population, and 70 and 80% of people with dementia will fall at least once a year.
- Fractures are three times more common in people with dementia than in the normal population, and hip fracture is also three times more common.
- The increase rate of falls may be due to the presence of gait abnormalities, orthostatic hypotension, postural instability, impaired executive function and impaired visuospatial skills.
- No interventions have been shown to prevent falls specifically in people with dementia.





# Case Study #2

This lovely gentleman lives in residential care and loves to walk outside every day. He has had several falls and sustained many soft tissues injuries. When staff attempted to prevent him from wandering he would become aggressive and combative. The staff decided to lower his risk of serious injury by providing hip protectors, knee pads, elbow guards and a soft football helmet. A walking frame was provided but later removed as he would forget to use it or lose it within the complex.

**It is not always possible to prevent every fall but we can lower the risk of serious injury.**





# Epilepsy

- Seizures: brief, unprovoked disturbances of consciousness, behaviour, motor function, sensation
- Seizures not mentioned by Alzheimer originally, but are in diagnostic criteria for AD
- Between 5% and 10% of people with dementia are reported to suffer from a seizure during the course of the disease
- Down Syndrome:
  - DS with AD – 50% had seizures
  - DS with no AD – 11% had seizures



# Epilepsy

- Increased risk for unprovoked seizures in AD vs control group:
  - 87 fold increased risk for 50-59 yo
  - 3 fold increased risk for 85+ yo
- 6 fold increase in dementia vs normal older population



# Epilepsy

- Seizure incidence slightly higher in patients with VaD vs AD
- Both generalised and partial seizures seen – partial more common in early AD, generalised more common later in AD
- Case reports:
  - amnestic wandering
  - “transient epileptic amnesia”
  - unexplained falls, and symptoms subsided with treatment

# Recommendations

- Be aware that seizures occur more commonly in patients with dementia
- Be aware that seizures may be atypical
- EEG may not be conclusive
- Consider possibility that ChEI may increase chance of seizures (but no trial evidence for this)
- Consider treatment with anticonvulsants:
  - valproate, carbamazepine

# Key Points- Epilepsy

- People with dementia have a six fold increased risk of having a seizure compared with the normal population.
- Between 5 and 10% of people with dementia are likely to have a seizure .
- Seizures are more common in younger people with Alzheimer's Disease than older people, and seizure incidence is higher in patients with vascular dementia than those with Alzheimer's Disease.
- Seizures may be atypical

# Oral Disease

- Poor oral health more common in people with dementia (compared with age matched controls)
  - Increased plaque accumulation and caries
  - Fewer natural teeth
  - Dry mouth (xerostomia)
  - Use dentures less often
- Occurs before diagnosis of dementia
- Chronic inflammation suggested as link between poor cognition and poor dentition

# Oral Disease

## More Information

- Good oral hygiene can prevent pneumonia in the older population
- Prophylactic removal of all teeth is not recommended in people with dementia as research suggest mechanoreceptive nerve terminals transmit spatial information and tooth load when chewing- a form of chewing memory.<sup>1</sup>

<sup>1</sup> Nordenram et al., *Gerodontology* (1997)



# Oral Disease

- Poor oral health is likely to be due to:
  - deterioration in ability to self care and inability to follow instructions
  - decreased motivation and reduced executive function
  - increasing dyspraxia and agnosia
  - decreased ability to adapt to changes such as dental plates or new dentures
  - increased combative behaviour particularly during personal care
  - emergence of sucking reflexes and involuntary tongue movements in later stage of dementia makes mouth care very difficult to deliver

# Examples of poor oral health



Slide courtesy of Peter Foltyn, 17/11/2014

# Recommendations

- Integrate oral health care into daily care routine:
  - Twice daily brushing
  - Use chlorhexidine containing mouth wash
- Dental review early in disease process with focus on retention of natural teeth
- Use of adequate sedation if dental work required in later stages of dementia
- Be aware of effect of medication particularly antipsychotics, anticonvulsants, and anticholinergics
- <http://www.health.gov.au/internet/main/publishing.nsf/Content/publications-Dental%20health>





# Key Points- Oral Disease

- Poor oral health is more common in people with dementia than in people without dementia.
- Changes may occur before the diagnosis of dementia.
- Oral disease occurring in dementia includes increased plaque accumulation and caries, fewer retained natural teeth, dry mouth, and less use of dentures.
- Oral disease in dementia is due to many factors, including poor self-care, inability to follow instructions, decreased executive function, increased dyspraxia and agnosia and behavioral problems.



# Physical Comorbidities of Dementia

## MODULE 2

### Frailty, Malnutrition & Delirium

Rehabilitation and Aged Care  
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# Frailty



- Rockwood (2003): multidimensional syndrome of loss of reserves (physical ability, cognition, health) which leads to increased vulnerability
- Fried (2001): weight loss, low grip strength, self reported exhaustion, slow walking speed, low physical activity
  - Wt loss, low activity, slow gait are all risk factors for dementia
- Cognitive impairment contributes to physical frailty

# Frailty and Dementia

- Evidence that decreases in strength and walking speed (“frailty”) predate onset of AD by many years
- In cohort study of 800+ older people, more AD cases developed in frail compared to non-frail over several years of follow up (Rush Aging and Memory Project)<sup>1</sup>
- Low grip strength is associated with cognitive impairment in many cohort studies

<sup>1</sup> Boyle, P., Buchman, A., Wilson, R., et al. *Journal of the American Geriatrics Society* (2010)



# Frailty and Dementia

- Suggestion that frailty and dementia share common underlying mechanisms:
  - Cardiovascular and cerebrovascular disease are risk factors for both frailty and AD
  - Raised levels of pro-inflammatory cytokines eg. Interleukin-1 & 6, and TNF- $\alpha$  are common to both, indicating possible state of **low grade chronic inflammation**
  - Mitochondrial malfunction
  - Oxidative stress

# Recommendations

- Exercise:
  - Increases hippocampal size
  - Slows cognitive decline
    - resistance/strength training (lowers interleukins and TNF- $\alpha$ )
- Address nutrition requirements
- Address psychological factors



# Key points- Frailty

- There is evidence that weight loss, decreased muscle strength and slow walking speed (all features of frailty) antedate the onset of cognitive changes in Alzheimer's disease by many years.
- In large cohort studies with many years of follow up, more cases of Alzheimer's disease occurred in frail older people than in non-frail people.
- Frailty and dementia may share common underlying mechanisms, including raised levels of proinflammatory cytokines indicating low-grade chronic inflammation, mitochondrial malfunction and oxidative stress.



# Malnutrition and weight loss



- In several cohort studies (of more than 20 years follow up), the authors found significant association between weight loss and **subsequent** development of AD.<sup>1</sup>
- Questions were raised about the relationship and a potential causative pathology with a link between medial temporal cortex atrophy and decreased body mass index (BMI)
- Dementia also increases the risk of malnutrition in residential high care, a Finnish<sup>2</sup> study found a 2 to 1 odds ratio (1.45 – 2.93) for malnutrition in patients with dementia vs. patients without dementia.

<sup>1</sup> Barrett-Connor et al., *Journal of Nutrition, Health & Aging* (1998)

<sup>2</sup> Suominen et al., *European Journal of Clinical Nutrition* (2005)



# Malnutrition and weight loss

- Described by Alois Alzheimer in his patient Johann F
- AD patients likely to lose on average >5kg during course of disease
- Possible causes are dysregulation of energy balance with most patients likely to lose up to 10% of body weight but some may gain up to 5% of body weight due to behavioral issues.
- People with VaD and FTD also experience weight loss
- Hospitalised people with dementia are at serious risk of malnutrition and dehydration and may need assistance with meals.

# Case Study #3

Mr J has been admitted to a medical ward following an episode of syncope. He normally lives in a residential aged care facility and receives high care. During the evening meal service , Mr J's evening meal was placed on the table in front of him. Before staff could assist Mr J with his meal he attempted to swallow a large piece of steak. Mr J began to choke, lost consciousness and was found by staff slumped in his chair, Mr j did not survive the code.

A quick visual system was introduced-

**RED placements mean full assist**

**BLUE placements mean meal set up and supervise.**



# Recommendations

- Identify dementia patients at risk of weight loss and protein energy malnutrition, and treat to prevent:
  - Loss of muscle mass and strength
  - Pressure ulcers
  - Loss of immunity and increased infection rate
- Intervene where weight loss of >5% in preceding 3-6 months
- Education of family and professional carers in nutrition is effective
- Enteral feeding in late stage dementia is unlikely to be effective

# Recommendations

- Dietary strategies:
  - Oral supplements 2 hours before meal
  - Finger foods
  - Favourite foods
  - Homelike environment (eg tablecloths)
  - Make meal time a pleasurable occasion
  - Background music
  - Regular exercise
  - Prevent dehydration



# Key Points-Weight loss & Malnutrition

- People with dementia may lose up to 10% of body weight during the course of the disease. People with vascular dementia and frontotemporal dementia are also likely to lose weight.
- Weight loss may occur up to 20 years before the appearance of cognitive symptoms.
- People with dementia at risk of weight loss and malnutrition should be identified and treated to prevent loss of muscle mass and strength, pressure ulcers and loss of immunity with subsequently increased rate of infection.
- Supplements are beneficial if given 2 hours before meals, not with meals as this reduces overall daily calorie intake.



# Delirium

- Disorder characterised by rapid onset, altered level of consciousness, disturbances in attention, orientation, memory, thinking, perception and behaviour and a fluctuating course.<sup>1</sup>
- Dementia is the strongest risk factor for occurrence of delirium
  - Presence of dementia increases risk of delirium 5 fold
  - 2/3 of cases of delirium occur in people with dementia
- Many cases go unrecognised as dementia is blamed for symptoms



# Delirium

- Lower cognitive reserve (lower education level) predicts higher risk of delirium
- Delirium is a serious medical event which can cause long term health complications
- More severe dementia predicts greater severity of delirium
- Multiple causes eg:
  - Acute medical illness and infection
  - Medications and alcohol
  - Discomfort and pain (eg urinary retention)
  - Hypoxia
  - Post operative

# Delirium

- Both delirium and dementia are associated with:
  - decreased cerebral metabolism,
  - cholinergic deficits
  - inflammation (causing oxidative stress)
- Delirium is associated with:
  - low Cholinesterase inhibitor levels
  - excess dopamine levels
  - dysfunction in other neurotransmitters
  - low IGF-1 (insulin-like growth factor)



# Recommendations

- Expect delirium in unwell and hospitalised older patients with dementia
  - Use CAM (Confusion Assessment Method) regularly to assess
  - Treat underlying cause
  - Keep mobile, well hydrated, oriented
  - Do not change locations (bed moves)
  - Use appropriate ward accommodation
  - Minimal use of antipsychotic medication
- Educate staff (and family carers)
- Do not use anticholinergic medications
- Do not use physical restraints

# Key Points- Delirium

- Dementia is the strongest risk factor for the occurrence of delirium, and people with dementia have a fivefold increased risk of developing delirium compared with people without dementia.
- Two-thirds of cases of delirium occur in people with dementia, but many cases go unrecognised, as dementia is blamed for the symptoms.
- Lower educational level and greater severity of dementia predict greater severity of delirium.
- There are likely to be similar underlying mechanisms for dementia and delirium, including decreased cerebral metabolism, cholinergic deficits and inflammation.



# Physical Comorbidities of Dementia

## MODULE 3

### **Visual impairment, Sleep dysfunction & Incontinence**

**Rehabilitation and Aged Care  
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# Visual Impairment

- Changes in visual acuity and contrast sensitivity, and visual field defects (with normal neuroimaging) may be early symptoms of AD and also VaD
- Also problems with colour vision, contrast sensitivity, and spatial localisation
- Difficulty with blurred vision, reading, writing, depth perception, driving, locating familiar objects, identifying people or objects
- Occurrence of visual hallucinations may be linked with impaired visual acuity

# Visual Impairment

- Blue Mountains Eye Study – significant association between impaired visual acuity and cognitive impairment (MMSE<24)<sup>1</sup>
- Age related macular degeneration is associated with cognitive impairment
- Possible increased incidence of glaucoma in people with dementia
- Retinal changes in AD:
  - Decrease in retinal nerve fibers
  - Vascular changes

<sup>1</sup> Tay et al., *Gerontology*, (2006)



# Recommendations

- Be aware of possibility of visual problems both early and late in the disease
- Review by optometrist or ophthalmologist early in disease process to address refractive errors, check intraocular pressures, presence of cataracts etc
- Encourage people with moderate to severe dementia to use their spectacles



# Case Study #4

Mr H is a 67 year old participant in a dementia research study. At a routine clinic visit during the visual field testing it was found MR H had left upper quadrantanopia (not seeing any object that was in his left upper field of vision) he was not aware of this and still driving. Mr H was followed up an ophthalmologist and the visual field deficit was confirmed. Repeat MRI brain scan at 3 months showed no abnormalities.

He no longer drives.



# Key Points-Visual impairment

- Symptoms of visual dysfunction may occur before cognitive symptoms in Alzheimer's disease and other dementias.
- Symptoms include blurred and distorted vision, difficulty recognising familiar objects or faces, difficulty reading or writing and hallucinations.
- Symptoms may be due to changes in visual acuity and contrast sensitivity, deficits in colour vision and visual field deficits.
- Visual dysfunction is likely to be due to dementia associated changes in the cerebral cortex, retina and optic nerve.



# Sleep Dysfunction

- Age related changes in sleep occur in most older people
- Circadian rhythm is disrupted in AD with delays and fragmentation of the sleep-wake cycle
- Appears to be due to decreased cell numbers in suprachiasmatic nuclei (the “body clock” which controls circadian rhythm), and presence of tangles
- Also loss of cholinergic neurons can lead to decrease in REM sleep



# Sleep Dysfunction

- Increased night time waking, and increased daytime sleeping
- Up to 50% of people with dementia or their carers report sleep disturbances
- Severity of disturbance increases with severity of dementia
- Sleep apnoea may occur more often in people with dementia

# Case Study #5

- Mrs B was admitted to high care following a fall at home which resulted in a fractured hip. She was unable to return home due to poor mobility and increasing dementia. Nursing home staff reported she was very unsettled at night calling out and drowsy during the day. Evening sedation had no effect, a new care plan was implemented. Family members visited during the day to keep Mrs B awake and more active. In the evening she was given paracetamol and melatonin, over the coming weeks Mrs B's sleep patterns stabilized to 7 hours sleep per night. She remains on paracetamol at night and the melatonin was discontinued after 2 weeks.
- A short course of melatonin prevents depressed mood a side effect of long term melatonin use.

# Recommendations

- Adequate exposure to bright light during day
- Exercise during day
- Avoid/limit daytime napping
- Sleep hygiene measures
- Use sedatives with caution
- Possible use of melatonin (Circadian) to reset circadian rhythm



# Key Points- Sleep dysfunction

- Changes in sleep occur in many older people, but are more prominent in people with dementia, particularly Alzheimer's disease, with up to 50% reporting significant sleep disturbances.
- The circadian rhythm is disrupted in Alzheimer's disease, with delays and fragmentation of the sleep cycle, and increased night-time waking and increased daytime sleeping.
- The severity of sleep disturbance increases with the severity of dementia.

# Urinary Incontinence

- Age related changes in bladder, prostate gland (in men) and pelvic floor muscles (in women) together with medications and functional decline lead to an increased vulnerability to incontinence in older people
- In dementia there is loss of cognitive ability to interpret the sensation of a full bladder, loss of motivation to inhibit the passage of urine, and inability to plan how to self-toilet. Dressing dyspraxia and visuospatial problems also occur

# Urinary Incontinence

- Occurs earlier in vascular dementia, dementia with Lewy bodies and FTD than in Alzheimer's disease
- Possible causes for urinary incontinence:
  - D: delirium, drugs
  - R: retention, reduced mobility
  - I: infection, impaction
  - P: polypharmacy, polyuria

# Case Study #6

Managing continence issues in people with dementia can be very challenging. Mrs Q has moderately severe dementia and some challenging behaviours. She is no longer able to self toilet, and staff manage her incontinence with two hourly toileting and continence pads. Often she removes the continence pad and smears the contents around her environment. Staff have been unsuccessful in prevent this behaviour with increased surveillance, so they designed an adhesive pad closure preventing Mrs Q from removing the pad, stool bulking agents were added to ensure regular bowel motions. The staff can manage Mrs Q's incontinence and control inappropriate behaviour.





# Recommendations

- Assess and treat reversible causes
- Prompted voiding 2 to 3 hourly
- Absorbent pads
- Beware anticholinergic medications
- Use catheterisation rarely



# Key Points- Incontinence

- In dementia there is a loss of cognitive ability to interpret the sensation of a full bladder, loss of motivation to inhibit the passage of urine and an inability to plan how to self toilet, together with dressing dyspraxia and visuospatial deficits leads to incontinence.
- Urinary incontinence occurs earlier in the course of vascular dementia, dementia with Lewy bodies and frontotemporal dementia than in Alzheimer's disease
- Remember the reversible causes of incontinence, D.R.I.P.



# Conclusion

- In clinical practice there are many conditions associated with dementia that are often unrecognised
- It is important that these are identified and managed appropriately to improve the care of people with dementia

# More information

More information on this topic can be found in the book “Physical Comorbidities of Dementia”

Book available at - [www.cambridge.org/9781107648265](http://www.cambridge.org/9781107648265)

