

Preventing Falls in People with Cognitive Impairment Is there any Evidence?

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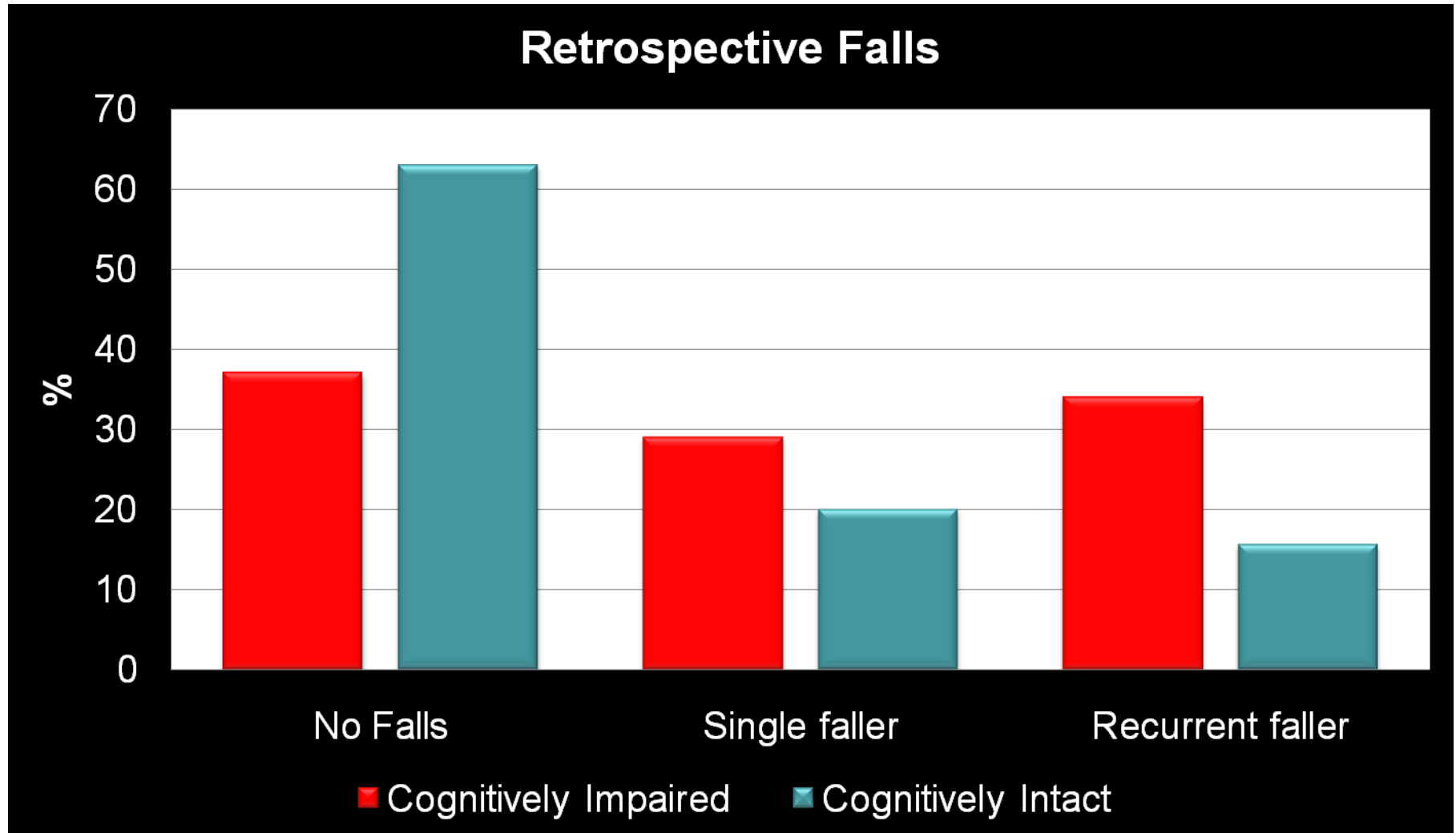
AGS/BGS Guidelines – Jan 2010

“There is insufficient evidence to recommend for or against multifactorial or single interventions to prevent falls in older persons with known dementia living in the community or in long-term care facilities”.

Epidemiology of falls in CI/ Dementia

- Annual incidence of falls in cognitively impaired populations is 70-80% ie. double the normal population
- Fractures are up to 3x commoner in people with dementia
- Gait abnormalities are more common in people with dementia espec VaD
- Psychotropic drug use more common in people with dementia
- Orthostatic hypotension more common

Cognitively Impaired v Cognitively Intact



Multifactorial intervention after a fall in older people with cognitive impairment and dementia presenting to the accident and emergency department: randomised controlled trial

Fiona E Shaw, John Bond, David A Richardson, Pamela Dawson, I Nicholas Steen, Ian G McKeith, Rose Anne Kenny

The application of a multifactorial intervention known to work in a cognitively intact population does not lead to a reduction in falls in a cognitively impaired population

Extrapolation from existing trials

If the mechanism by which the intervention has its effect is understood and not felt to be affected by the presence of cognitive impairment / dementia then it is reasonable to extrapolate data from trials undertaken in cognitively intact populations

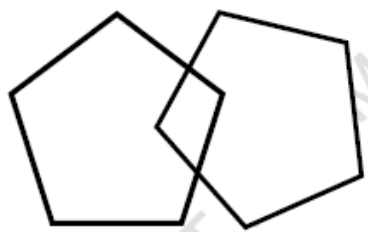
Example 1. Treatment of osteoporosis with bisphosphonates

However – that assumes that the risk factor profile and contributors to overall risk in cognitively impaired people is comparable to that of cognitively intact subjects

MMSE (Folstein 1975)

| | | |
|--|----------------------------|--|
| FOR MEDICAL RECORD USE ONLY -MEDICAL RECORD COPY - South Eastern Sydney Illawarra Area Health Service | | SURNAME: _____ MRN: _____ OTHER NAMES: _____ DOB: _____ SEX: _____ AMO: _____ |
| MINI MENTAL STATE EXAMINATION (MMSE) <i>Folstein et al 1975 J.Psych.Res.V.12 p.189</i> | | AFFIX ADDRESSOGRAPH LABEL HERE |
| Date _____ | Time _____ | |
| Assessor's Name _____ | Assessor's Signature _____ | |
| PATIENTS / CLIENTS DETAILS: | | |
| Occupation _____ | Education Level _____ | |
| Hearing _____ | Vision _____ | |
| RECORD EXACT REPLIES. ENTER SCORES OUT OF MAXIMUM SHOWN. NO HALF MARKS AWARDED. | | |
| 1. ORIENTATION | | SCORE POINTS |
| What is the? | | |
| Year | _____ | 1 |
| Season | _____ | 1 |
| Date | _____ | 1 |
| Month | _____ | 1 |
| Day of Week | _____ | 1 |
| Where are we? | | |
| HOME | HOSPITAL | |
| Country | Country | 1 |
| State | State | 1 |
| Town / Suburb | Town / Suburb | 1 |
| Street | Place | 1 |
| Number | Floor / Room | 1 |
| 2. REGISTRATION | | |
| Name three objects, taking one second to say each, then ask the patient to repeat them. (Score number correct at first attempt) | | |
| Apple | Table | Coin |
| Repeat them until the patient learns all three | | _____ 3 |
| Inform patient that you will ask for patient to recall them | | |
| Number of trials (up to 6) required to learn the answers _____ | | |
| Alternate words for subsequent tests - Ball, Car, Man Cake, Book, Tie | | |
| 3. ATTENTION / CONCENTRATION | | |
| (A) Serial Sevens (Take 7 away from 100 and keep taking 7 until I say stop - stop after five answers) Answers - 93, 86, 79, 72, 65 | | |
| AND / OR | | |
| (B) Spell WORLD backwards (Score is the number of letters in correct order) | | |
| Note - Complete both (A) and (B) and record the higher score. | | _____ 5 |
| 4. RECALL | | |
| Ask the patient to name the three objects in Question 2 | | _____ 3 |
| 5. LANGUAGE | | |
| (A) Ask the patient to name the following as you point at them | | |
| 'Pen' | 'Watch' | _____ 2 |
| (B) Have the patient repeat | | |
| 'No ifs, ands or buts' | | _____ 1 |
| (C) Have the patient follow a three stage command | | |
| "Take this paper in your right hand. Fold the paper in half. Put the paper down in your lap." | | _____ 3 |

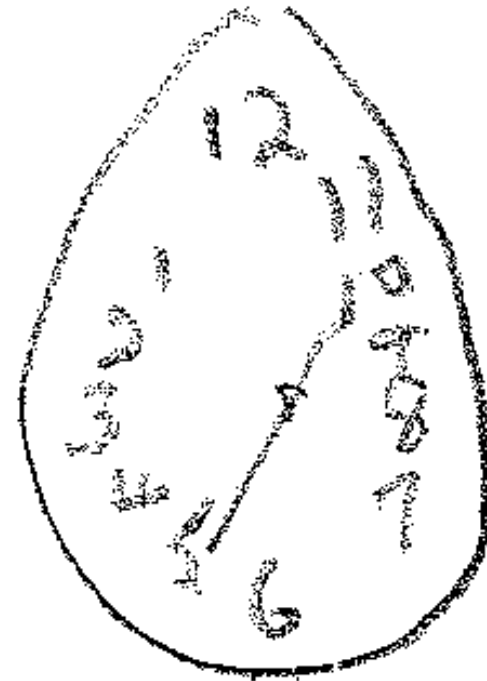
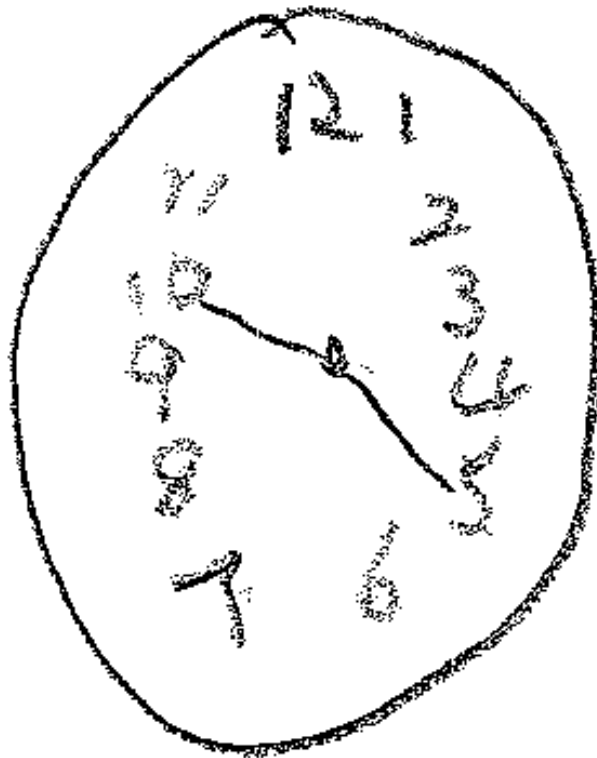
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| | SCORE | POINTS |
| (D) Have the patient read and obey the following | | |
| close your eyes | | 1 |
| (E) Ask the patient to write a sentence below * | | |
| _____ | | |
| _____ | | |
| _____ | | 1 |
| 6. CONSTRUCTION | | |
| Ask the patient to copy this design ** | | |
|  | | |
| | | |
| | | 1 |
| TOTAL SCORE | | 30 |
| * To score section 5E: The sentence must have a subject, a verb and make sense. Correct grammar and punctuation are not necessary | | |
| ** To score section 6: The two diagrams must each have 5 sides, with the intersecting shape having 4 sides | | |

MMSE

- **Affected by level of education**
- **Affected by age**
- **Affected by language**
- **Too many easy items**
- **Wrongly used as a unidimensional tool**
- **Wrongly used to diagnose dementia**
- **Wrongly(?) used to justify prescription of cholinesterase inhibitors**

MMSE 25 ACE-R 77



Verbal Fluency

MMSE 26 ACE-R 72

Letter P

| |
|---------|
| pencil |
| people |
| _____ |
| physics |
| _____ |
| _____ |
| _____ |

MMSE 28 ACE-R 74

Animals

| |
|------------|
| dog |
| _____ |
| dromedary |
| _____ |
| duke |
| _____ |
| ducks hood |
| _____ |
| dragonfly |
| _____ |

MMSE 28 ACE-R 78

Animals

| |
|-----------|
| cat |
| catapult |
| _____ |
| alf |
| cockroach |
| _____ |
| _____ |

Intervention in the Community

EXERCISE INTERVENTIONS – Level 1 evidence

| | |
|------------------------|--|
| Wolf, 1996 | “free from debilitating processes” |
| Campbell, 1997 | MSQ <7 |
| Buchner, 1997 | ‘major psychiatric illness’ |
| Robertson, 2001 | “unable to understand trial requirements” |
| Barnett, 2003 | “excluded if they had cognitive impairment” |
| Lord, 2003 | MMSE <20 |
| Means 2005 | MMSE <25 |
| Li 2005 | “having no cognitive impairment” |
| Skelton 2005 | “significant cognitive impairment” |
| Voukelatos 2007 | “excluded if they had dementia” |

Extrapolation – if benefits from exercise are from improved strength, balance & reaction time – why shouldn't people with cognitive impairment and dementia benefit.

| Physiological Measure | Cognitively Impaired (n=176) | | Cognitively Intact (n=352) | |
|----------------------------------|---------------------------------|--------------|-------------------------------|---------------|
| Melbourne Edge Test | 20 | (17 - 21) | 19 | (18 - 21) |
| Proprioception | 2 | (1.4 - 3.4) | 2.2 | (1.2 - 3.2) |
| <u>Reaction Time (ms)*</u> | 273 | (235 - 351) | 254 | (217 - 280) |
| <u>Quads Strength (kg)*</u> | 19 | (13 - 24) | 23 | (17 - 31) |
| <u>Balance (mm²)*</u> | 1907 | (987 - 2500) | 818 | (477 - 1520) |
| <u>Falls Risk Score*</u> | 2.0 | (0.9 - 3.1) | 0.77 | (0.17 - 1.65) |

Intervention in the Community

NON-EXERCISE SINGLE INTERVENTIONS

| | |
|----------------|--|
| Cumming , 1999 | not excluded if live in carer |
| Nikolaus, 2003 | excluded “severe cognitive decline” |
| Campbell 2005 | “unable to understand trial requirements” |
| Harwood, 2005 | excluded “those with memory problems preventing the completion of the lengthy questionnaire” |
| Kenny, 2001 | MMSE <24 |
| Day, 2002 | MSQ < 6 |
| Campbell, 1999 | MSQ <7 |

Extrapolation – Cognitively impaired people will have been included in some of these studies. Above interventions may have benefit in people with cognitive impairment.

Intervention in the Community

MULTIFACETED INTERVENTIONS

Tinetti, 1994

MMSE <20

Hornbrook, 1994

“severely mentally ill”

Clemson 2002

MSQ <8

Wagner, 1994

?

Close, 1999

not excluded if live in carer

Davison, 2005

MMSE <24

*Mahoney 2007

benefits only in people with MMSE <27

Extrapolation – Cognitively impaired people will have been included in some of these studies. Above interventions may have benefit in people with cognitive impairment.

Interventions in RACF

MULTIFACETED INTERVENTION

| | |
|---------------|--------------------------------------|
| Ray 1997 | Did not exclude cognitively impaired |
| Jensen 2002 | Did not exclude cognitively impaired |
| Schnelle 2002 | Did not exclude cognitively impaired |
| Becker 2003 | Did not exclude cognitively impaired |

Jensen 2003 – benefits were in those with MMSE >19

Becker 2008 – benefits were enhanced in those with cognitive impairment (MDS–Rai)

Cognitively impaired people should not be excluded from multifaceted RACF based falls prevention programs

Interventions in Hospitals

MULTIFACETED INTERVENTION

Haines 2004 Cognitively impaired people included

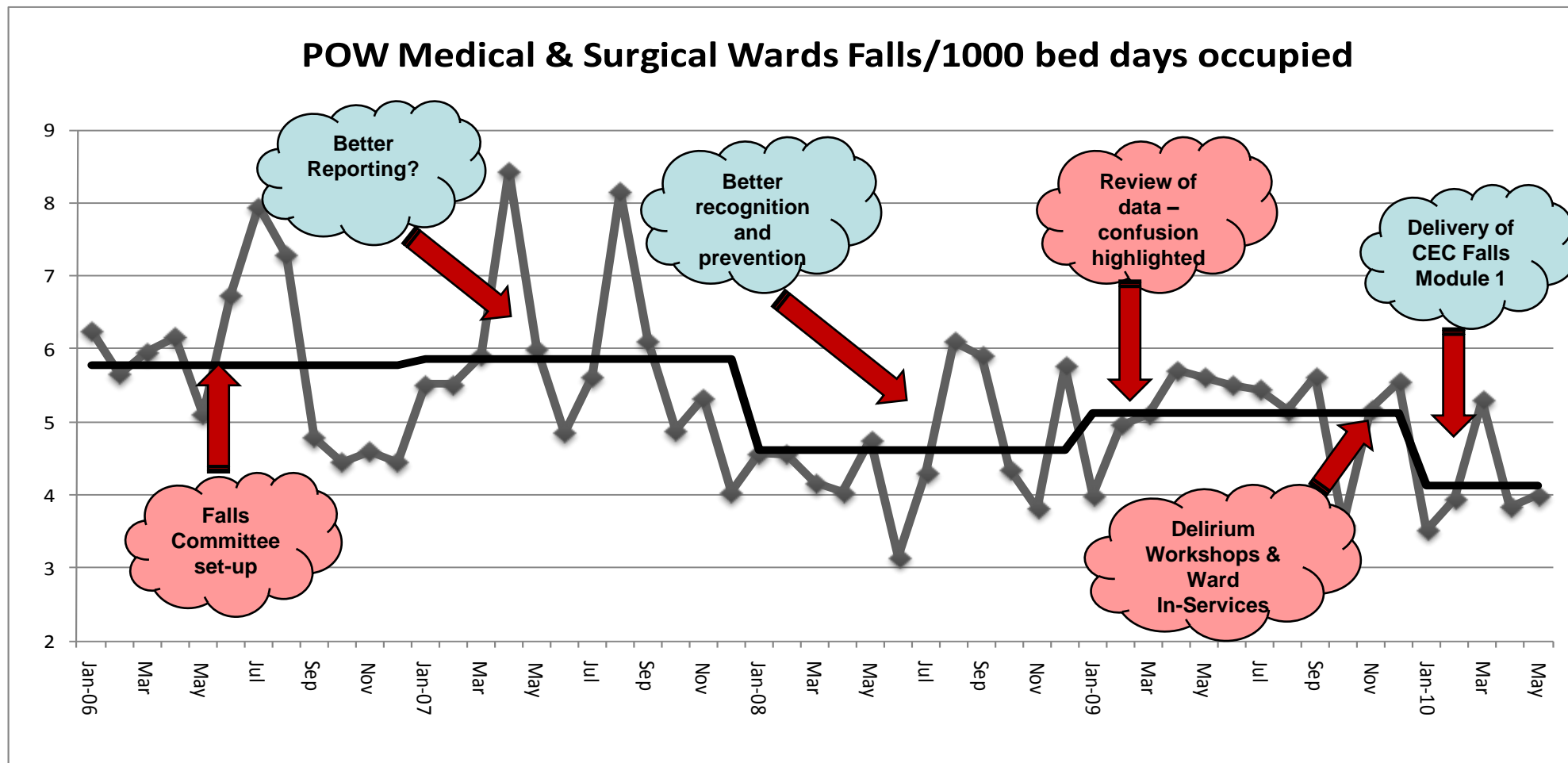
Healey 2004 Cognitively impaired people included

Stenvall 2007 Cognitively impaired people included

All conducted in Aged Care wards

Cognitively impaired people should not be excluded from multifaceted hospital based falls prevention programs

Preventing In-Patient Falls - A Journey not an RCT



Deaths from Falls (SESIAHS) - 2009

| Age | Gender | Cog Imp | Anticoag | INR | High Risk | AIN | Issues wth PFM | Surgery |
|-----|--------|---------|----------|-----|-----------|-----|----------------|---------|
| 81 | F | Y | | | Y | N | | N |
| 61 | M | | Y | 5.0 | | N | Y | N |
| 85 | M | | Y | ? | | N | | N |
| 90 | F | Y | Y | ? | Y | N | Y | N |
| 81 | M | | Y | ? | Y | N | | |
| 62 | F | Y | | | Y | N | | |
| 77 | F | Y | Y | 1.2 | Y | N | Y | |
| 91 | M | Y | | | Y | N | | |
| 80 | F | Y | | | Y | N | Y | Y |
| 88 | F | Y | Y | ? | Y | N | Y | |
| 83 | F | | Y | 1.8 | | N | Y | |

Case 1

- **Day 1 77 yr old female presented to ED with digoxin toxicity (CT head in ED – no bleed). On warfarin but subtherapeutic.**
- **Admitted for cardiac monitoring. Clexane cover.**
- **Day 2. Following day documentation of fluctuating confusion (not investigated)**
- **Day 3. Next day – documentation of requiring direction to the toilet**
- **Day 4 0940hrs. Found on floor in bathroom – fell on bottom**
- **Day 4 1030. Drowsy with GCS 11. CT – bilateral subdurals and SAH**
- **Made palliative**

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Common Themes – Before the Fall

- **Confusion!!!!!!!!!!!!!!**
- **Failure to recognise risk of falls – not applying modified STRATIFY**
- **Side Rails**
- **Sub-optimal management of the confused older person including leaving alone in the bathroom**
- **Reluctance to request AIN**
- **Infection taking priority over falls risk**

Common Themes – After the Fall

- **Brain insult is what kills the fallers**
- **Reliance on GCS and not cognitive change**
- **Failure to recognise risk of injury in event of a fall when on anticoagulation, ESRF, haematological problem etc**
- **Failure to apply appropriate post fall management including neuro – obs**
- **Reluctance of neurosurgeons to operate (possibly too late by time they get involved)**

Conclusions

- **Cognitive impairment and dementia are poorly and inconsistently defined in falls prevention studies**
- **Screening tests used in common practice have limited ability to detect impairment in important cognitive domains**
- **Little doubt that people with cognitive impairment have been included in some community based studies**

Conclusions

- **Extrapolation of results from cognitively intact populations to cognitively impaired populations requires careful consideration**
- **Cognitive impairment has not been an exclusion criteria in successful trials in hospitals and RACF**

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