

Falls: fact, fiction and the future



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Fiction

- Falls are an inevitable part of ageing
- Nothing can be done to stop falls
- It is not possible to improve balance in the elderly
- The elderly wont do exercises
- Most falls are due to environmental hazards
- Sleeping pills are OK
- A zero falls rate is achievable

Why worry about falls and
balance disorders?

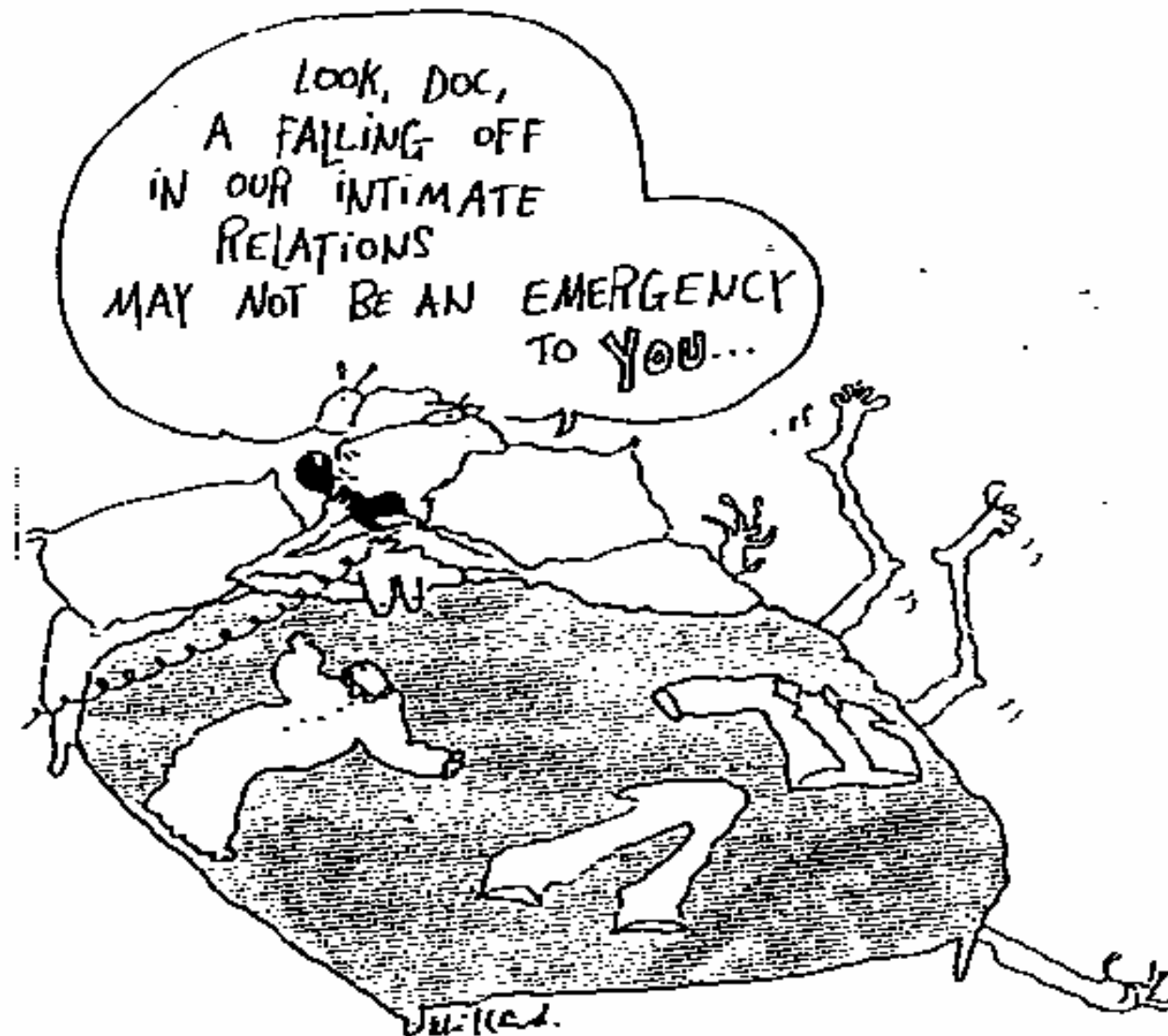
Falls rates

- 30% of people > 65 fall annually
- 50% of people > 80 fall annually
- 2 to 3 fold increase in falls rates for those in hospital or Residential Aged Care Facility (RACF)

Falls mortality and morbidity

- 6th leading cause of death
- 5% fracture or hospitalisation (community dwelling)
- 10-25% fracture or hospitalisation (RACF)
- 50% fear of falling
- 25% activity restriction

What is a fall?



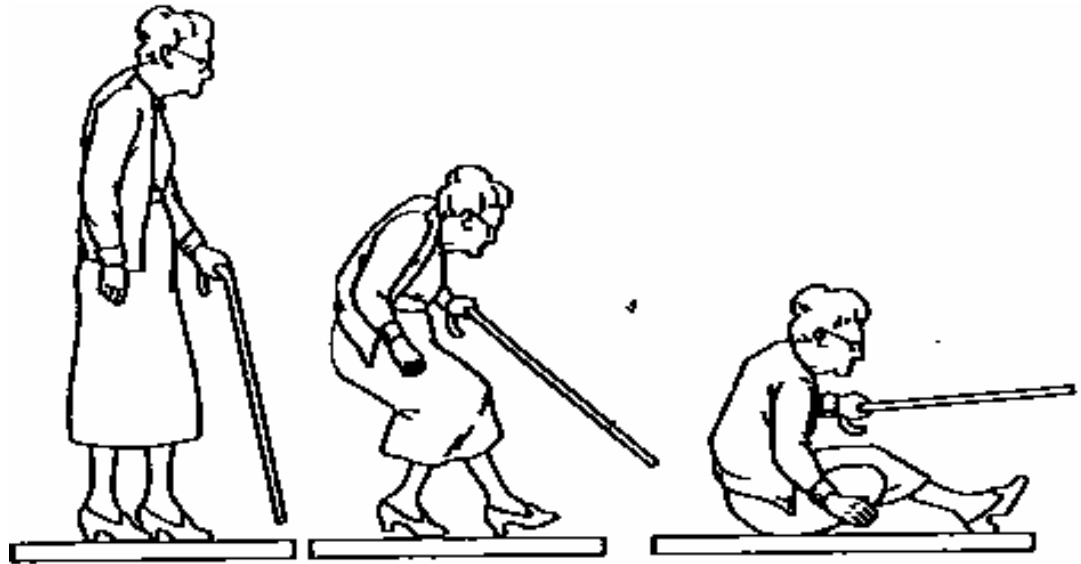
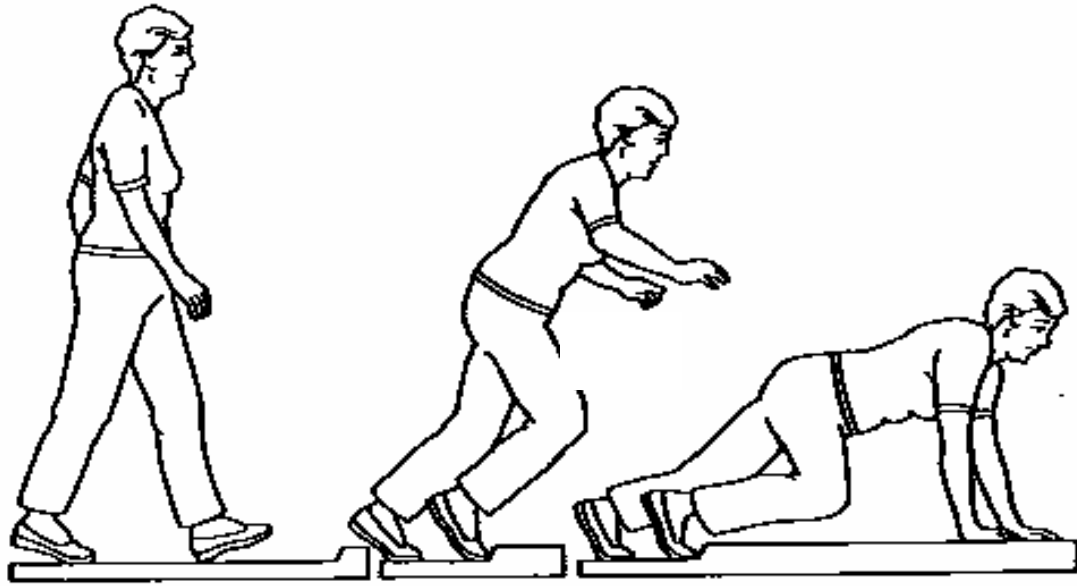
Falls Definition

“An event which results in a person coming to rest inadvertently on the ground or other lower level and other than as a consequence of the following:

- loss of consciousness
- sustaining a violent blow
- sudden onset of paralysis
- epileptic seizure.”

Gibson M (ed) Danish Medical Bulletin, 4,34.1987

What is a mechanical fall?



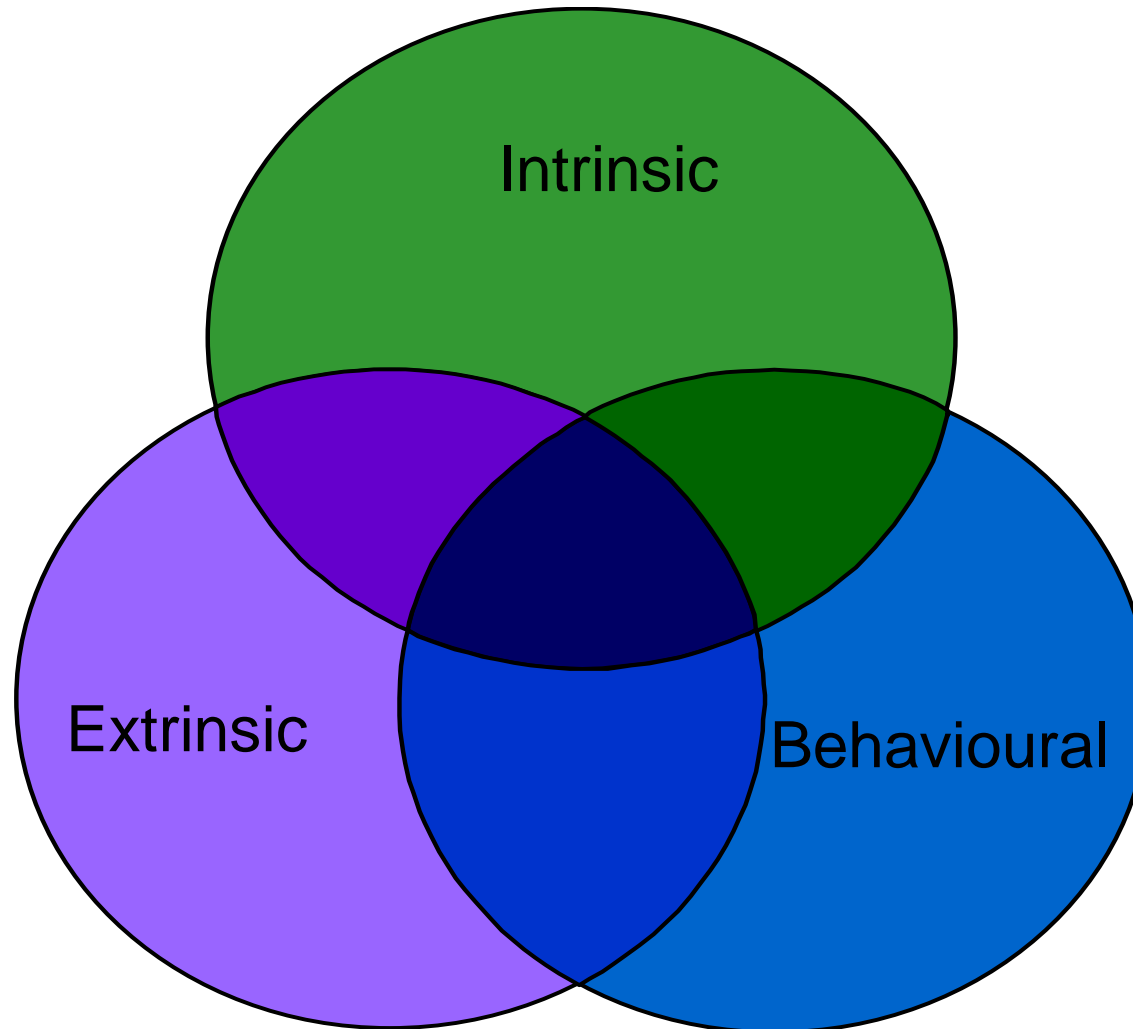
How do you classify falls?

Falls Classification

- falls due to major external factors
- falls with impairment/loss of consciousness
- “hot falls”
- “cold falls”

Campbell AJ et al. Br J Hosp Med 1995;54:520-523

Falls Classification



Behavioural factors



Extrinsic factors (environmental hazards)



Extrinsic factors (environmental hazards & medications)



Intrinsic factors (Age related & disease)



Falls risk factors: psychosocial and demographic

- Advanced age ***
- female gender **
- living alone **
- history of falls ***
- inactivity **
- ADL limitations ***
- alcohol consumption -

*** strong evidence
** moderate evidence
* weak evidence
- no evidence

Falls risk factors: balance & mobility

- impaired stability in standing **
- impaired stability when leaning/reaching **
- inadequate response to external perturbation *
- slow voluntary stepping **
- impaired gait/mobility ***
- impaired sit to stand ***
- impaired transfers ***

*** strong evidence
** moderate evidence
* weak evidence
- no evidence

Falls risk factors: sensory / neuromuscular - normal ageing

- visual acuity **
- visual contrast sensitivity ***
- visual field dependence *
- reduced peripheral sensation ***
- reduced vestibular function -
- muscle weakness ***
- poor reaction time ***

*** strong evidence
** moderate evidence
* weak evidence
- no evidence

Falls risk factors: medical = disease

- impaired cognition ***
- depression **
- neurological signs **
- stroke ***
- incontinence **
- acute illness **
- Parkinsons disease ***
- vestibular disorders -
- arthritis **
- foot problems **
- dizziness *
- orthostatic hypotension -

*** strong evidence

** moderate evidence

* weak evidence

- no evidence

Falls risk factors: medication

- psychoactive medication ***
- antihypertensive use *
- NSAIDS -
- use of > 4 medications ***

*** strong evidence
** moderate evidence
* weak evidence
- no evidence

Falls risk factors: environment

- poor footwear
- inappropriate spectacles
- home hazards
- external hazards

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*** strong evidence

** moderate evidence

* weak evidence

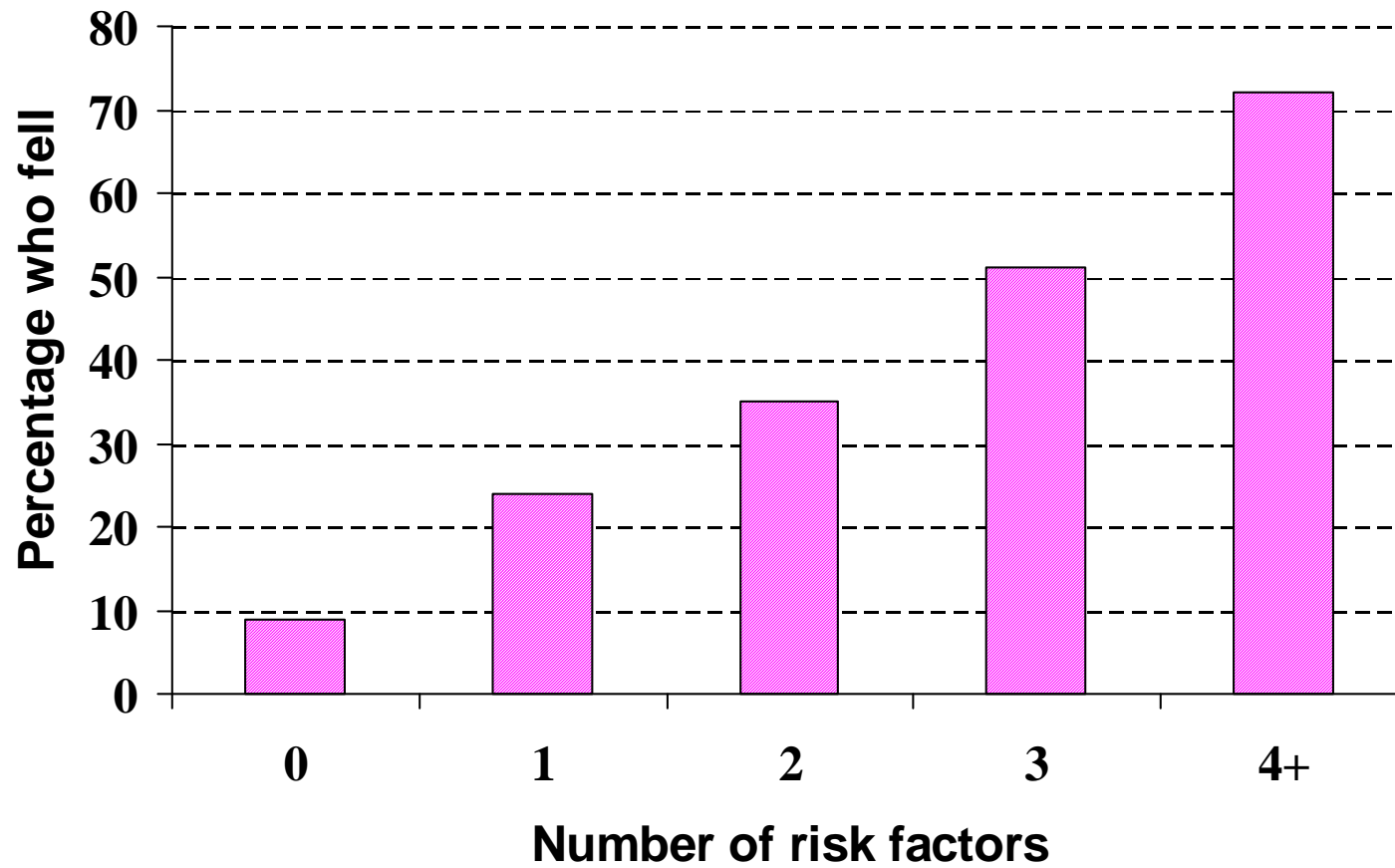
- no evidence



SHOES



Number of risk factors



Tinetti et al, 1988

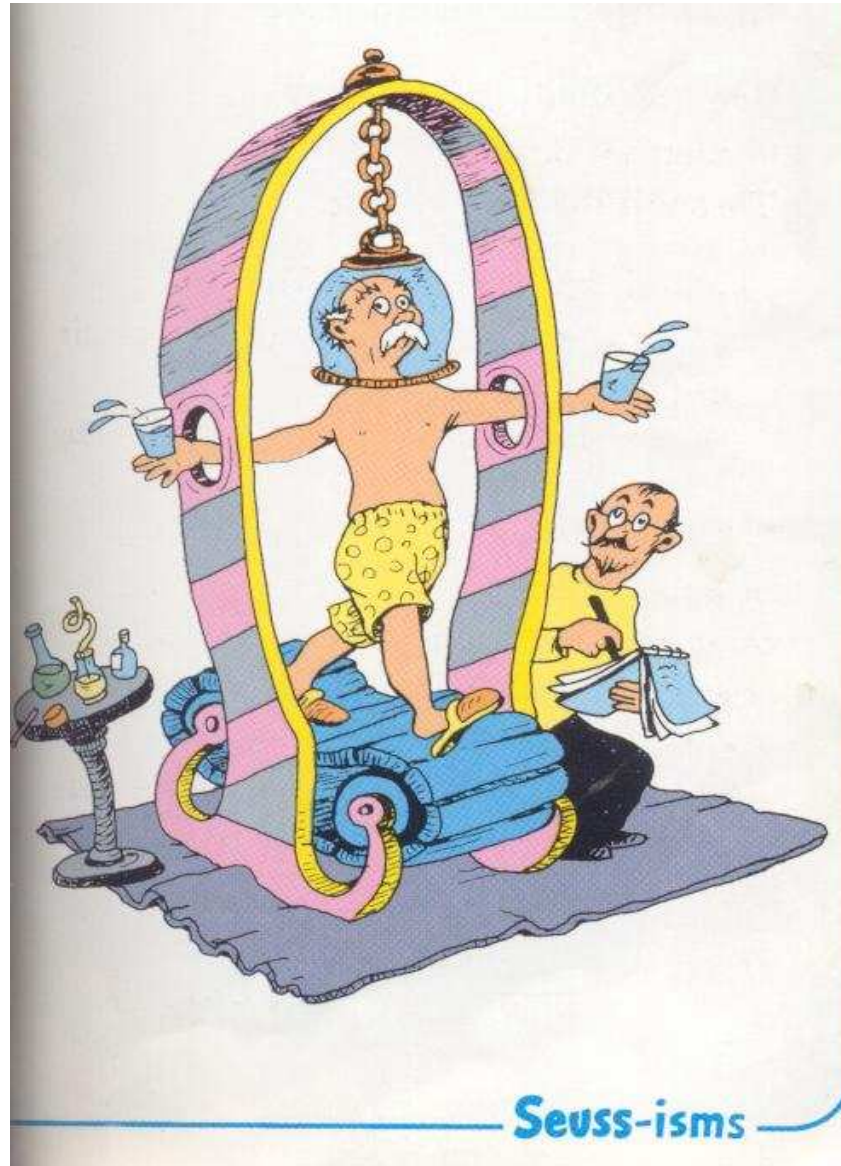
Who do you investigate?



Who do you investigate?

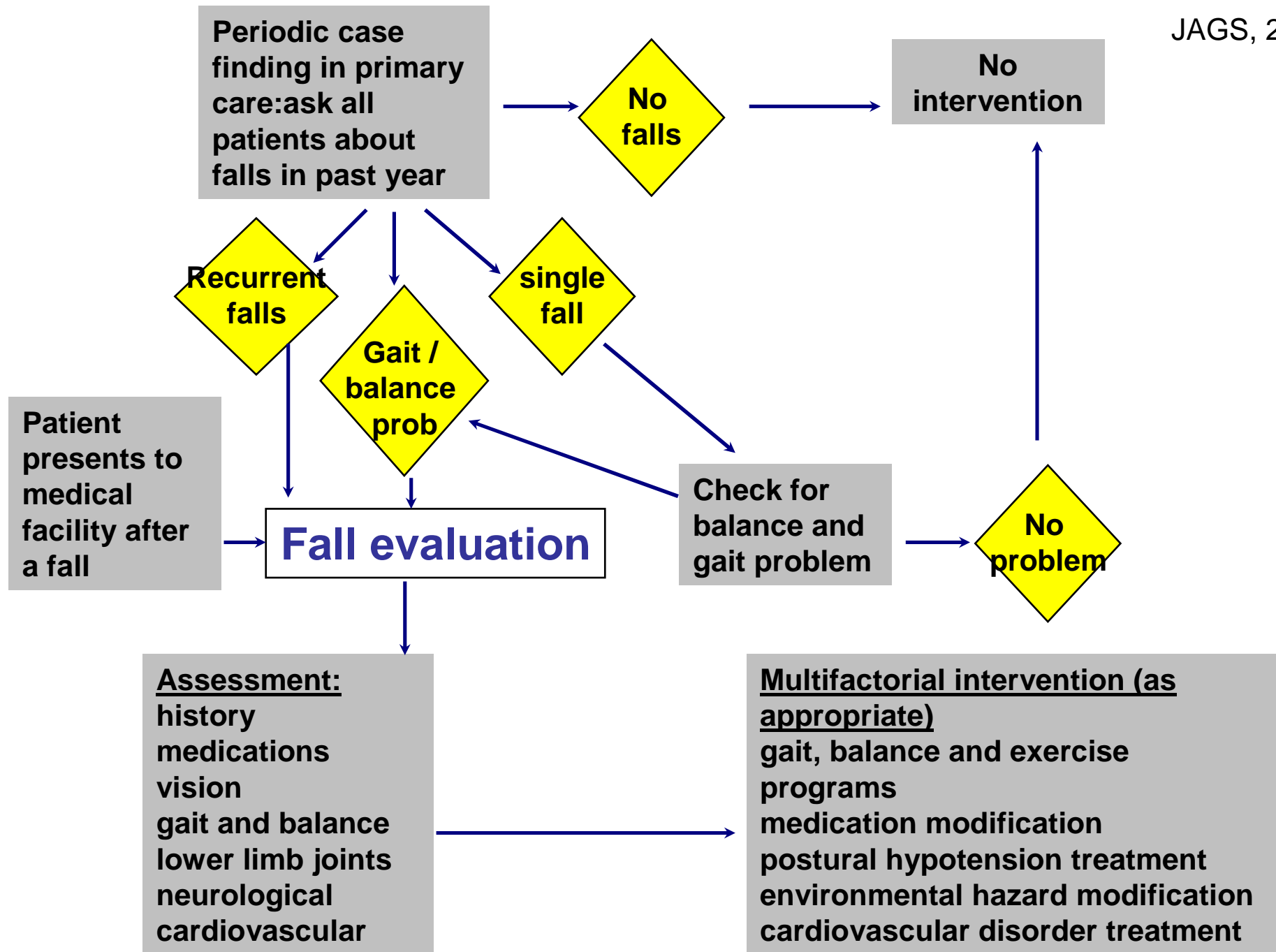
- All fallers?
- More than a certain number of falls?
- Injurious versus non-injurious falls?
- Frail versus vigorous elderly?
- Dependent on residential location?

How do you investigate?



Examination

- Postural hypotension
- Tests of balance and mobility
 - Timed up and go
 - Functional reach
 - Walk and talk test
 - Performance-orientated assessment of mobility problems



What can be done to prevent falls?



Falls Prevention: Single intervention strategies

Reduction of psychotropic medication:

- One RCT
- 66% reduction in risk of falls
- Many recommenced benzodiazepines following trial

Campbell AJ et al. J Am Geriatr Soc. 1999b;47:850-853

Falls Prevention: Single intervention strategies

Cataract surgery:

- 34% reduction in falls
- ↓ fracture rate (3% intervention vs 8% controls)

Harwood RH et al. Br J Ophthalmol. 2005;89:53-59

Falls Prevention: Single intervention strategies

Vision correction (glasses):

- Changing from bifocal to unifocals has reduced falls
- Immediately following correction of refraction errors falls rates increase

Falls Prevention: Single intervention strategies

Cardiac pacing (SAFE PACE I)

cardioinhibitory carotid sinus hypersensitivity:

- 58% reduction in falls
- 70% reduction in fall-induced injuries
- “young”, female, normal cognition, neurologically intact

- Not reproduced in SAFE PACE II
- Older, frailer, cognitive impairment

Kenny RA et al. J Am Coll Cardiol. 2001;38:1491-96

Kannus P et al. Lancet;2005:1885-1893

Falls Prevention: Single intervention strategies

Vitamin D +/- calcium

- ↑ muscle strength
- ↑ dynamic balance
- ↓ falls by 20 - 50%
- Institutional and frail elderly
- Dose dependent
- Enhanced by calcium

- Negative randomised trials also exist
- Conflicting result regarding fracture prevention

Kannus P et al. Lancet;2005:1885-1893

Oliver D et al. BMJ;2007:334:82-87

Fracture Prevention: Single intervention strategies

Hip protectors:

Cochrane review of 14 RCT

- Up to 50% reduction in # NOF in Nursing Home residents
- No evidence of benefit in low risk elderly
- Compliance is a major issue
- Biomechanical testing is a major issue

? Protection at other sites eg helmets and wrist protectors

Parker MJ et al. Cochrane Database Syst Rev 2004;3: CD001255

Oliver D et al. BMJ;2007;334:82-87



Falls Prevention: Single intervention strategies

Home hazard assessment and modification:

- Cochrane review (3RCT)
- 30% reduction in falls
- Needs to be done by trained staff

Gillespie et al. Cochrane Database Syst Rev 2003 Issue 4.

Falls Prevention: Multiple intervention strategies

- Variable results
- No evidence for ↓ falls in acute hospital inpatients
- 30% reduction in falls with targeted programs in Aged Care wards and sub-acute hospitals
- Some evidence of ↑ falls in Nursing Home residents
- 20-45% reduction in falls;
 - predominantly community studies
 - Also reduction in number of people falling

Kannus P et al. Lancet;2005:1885-1893

Haines et al. BMJ 2004;328:676-79

Kerse N et al. J Am Ger Soc 2004;52:524-31

Healey F et al. Age Ageing 2004;33:390-95

Falls Prevention:

Multiple intervention strategies

Types of interventions:

- strength, balance and gait re-training
- Improving transfers and gait +/- gait aid
- Footwear modifications
- Medical review and management
- Medication review and management (psychotropics)
- Vision testing +/- referral
- Hip protectors
- Education (staff and patients)
- Fall alert cards and bracelets
- Post fall assessments
- Home hazard assessment and modification

Fracture Prevention: Multiple intervention strategies

- Most falls prevention trials lack adequate power to detect significant changes in frequency of injuries
- One study showed a non-significant 28% reduction in injurious falls in the intervention group (sub-acute hospital)
- Positive trends in some controlled population-based (non-randomised) falls prevention programs
- No difference in injury rates in 3 randomised studies

Kannus P et al. Lancet;2005:1885-1893

Haines et al. BMJ 2004;328:676-79

McClure R et al. Cochrane Database Syst Rev 2005. Issue 1.

The future

Growing **old** is inevitable, growing **up** is optional.

(ANON)



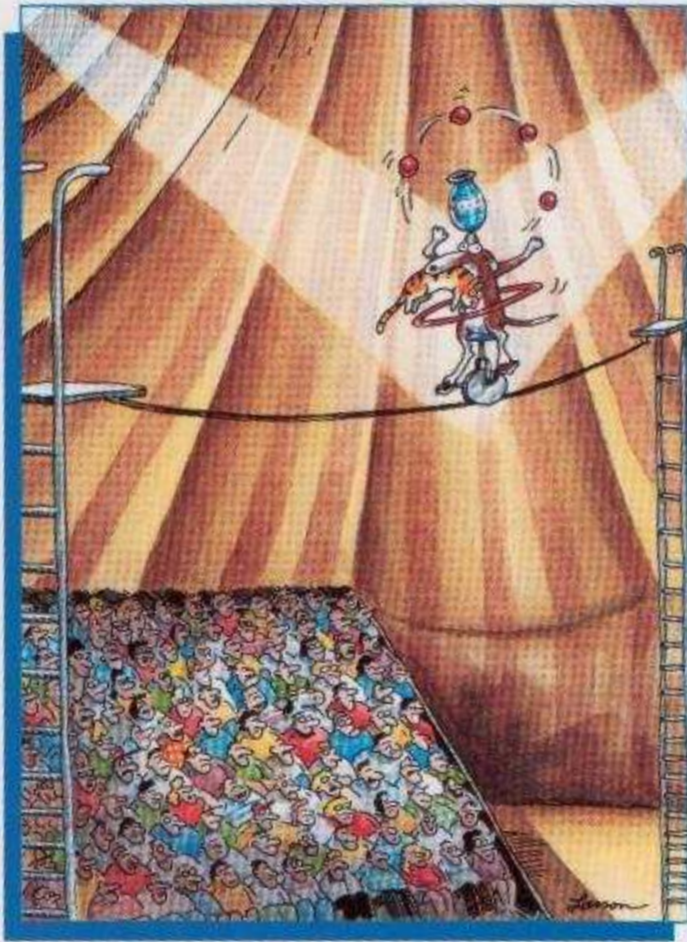
M·I·L·K

Issues

- “Acceptable” falls rates
- Sub-groups need further assessment (males, cognitively impaired, stroke etc)
- Site specific interventions (home vs hospital vs subacute vs residential care)
- Studies large enough to assess injury rates as well as falls

Issues

- Proper testing of current interventions:
 - Bed/chair alarms & movement detectors
 - Gait aids
 - Teaching how to get up from the floor
 - Footwear modifications
 - Restraints
 - Visual correction with glasses/bifocals
 - Less resistant flooring



High above the hushed crowd, Rex tried to remain focused. Still, he couldn't shake one nagging thought: He was an old dog and this was a new trick.

Questions?