



AUSTRALIAN COLLEGE OF
OPTOMETRY

CLINICAL SERVICES • EDUCATION • RESEARCH

Falls are a big problem: How you can help prevent them

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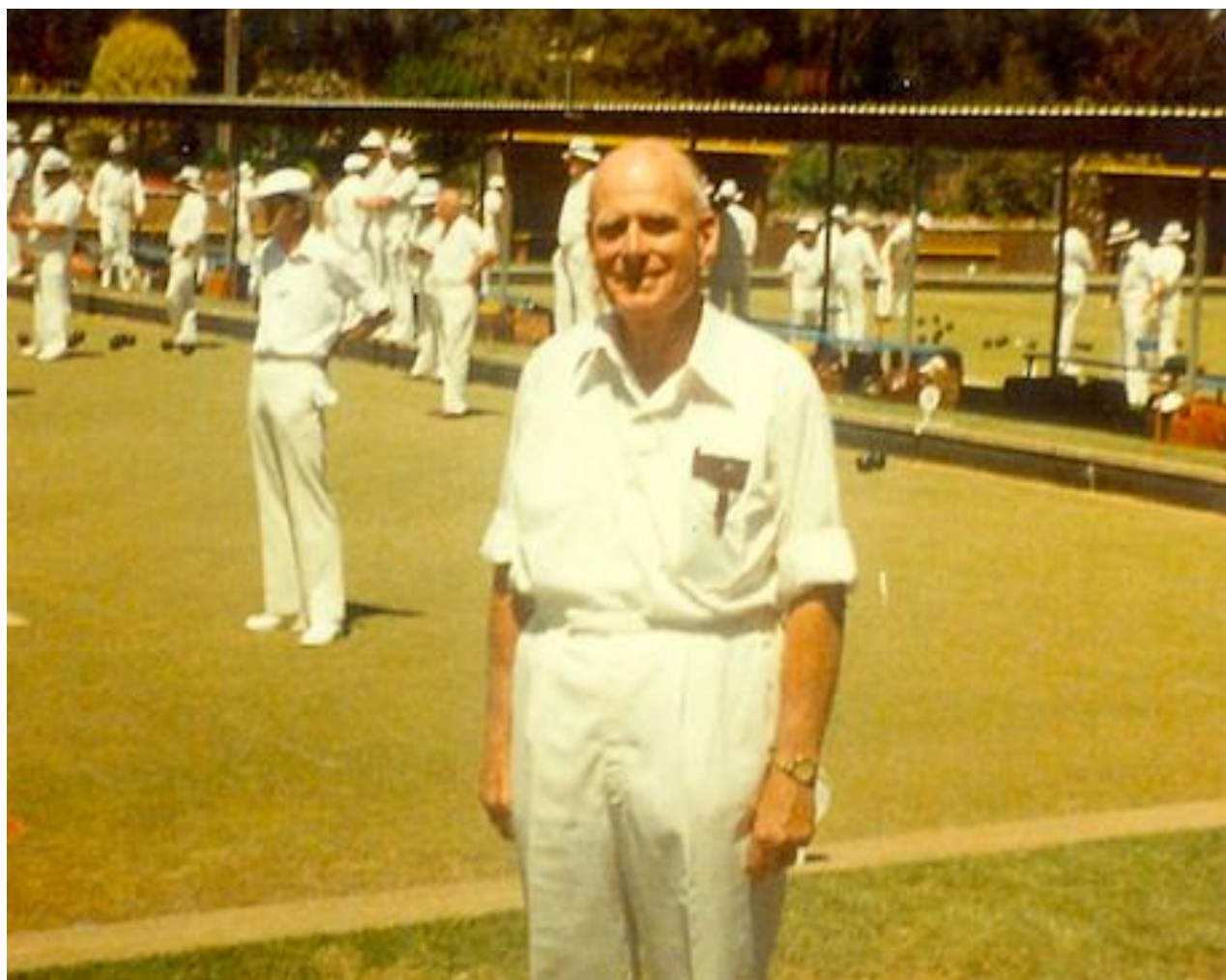




Lecture Objectives

1. Identify patients who are at high risk for falls
2. Prescribe the most appropriate vision aids and interventions to reduce the risk for falls
3. Suggest referral for applicable general health and lifestyle interventions
4. Advise patients on home modifications and design a safe practice environment for preventing falls





Prevalence

Among community dwellers, falls are experienced by:

- 30% over 65 years

(O'Loughlin et al., Am J Epidemiol, 1993)



Where do they happen?

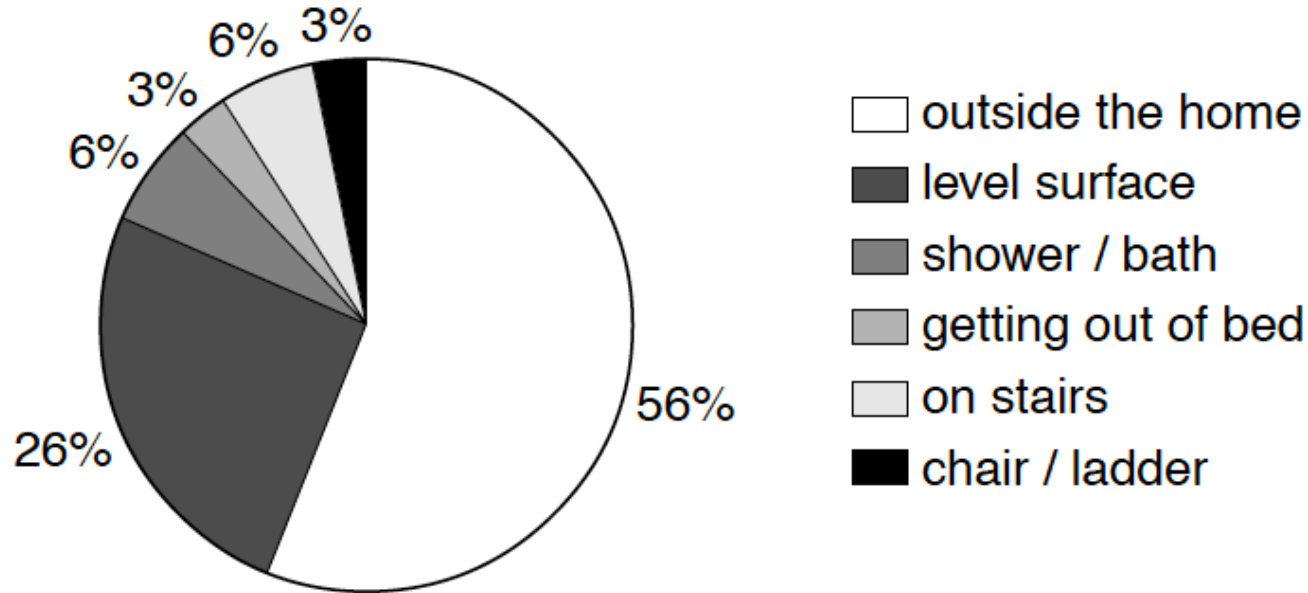


Fig. 1.3. Location of falls. 56% of falls occur outside the home (in the garden, street, footpath or shops), with the remainder (44%) occurring at various locations in the home. Adapted from: Lord SR, Ward JA, Williams P, Anstey KJ. Physiological factors associated with falls in older community-dwelling women. *Australian Journal of Public Health* 1993;17(3):240–5.

Prevalence

Falls more prevalent in hospital and residential care settings



Consequences

Physical injuries:

- 10% of falls result in serious injuries (Kellog Int. Working Group, Dan Med Bulletin, 1987)
- Of those, 5% are fractures (wrist, spine, hip, humerus, pelvis)

Consequences

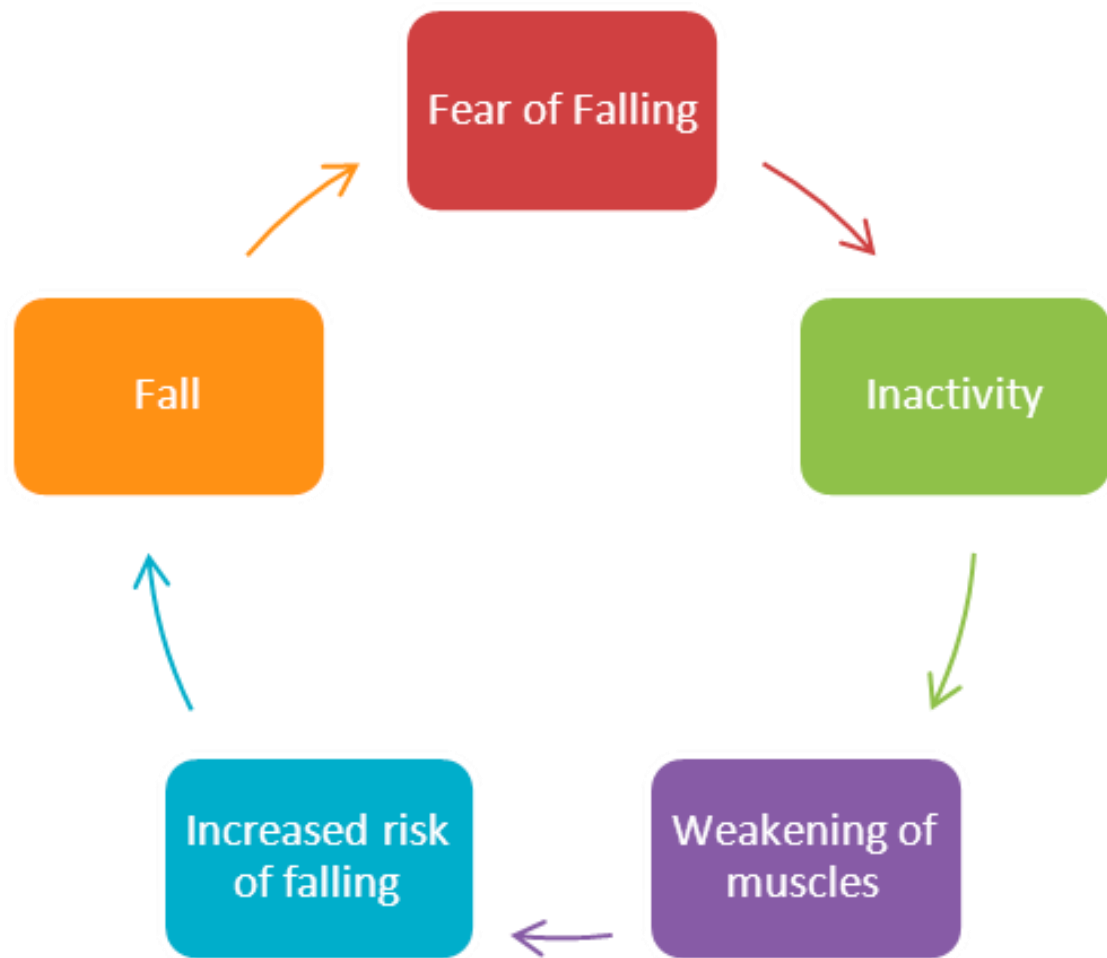
- 50% of those with hip fracture will never be functional walkers again and 20% die within 6 months



Consequences

Psychological problems – ‘post-fall syndrome’:

- Fear of falling



Consequences

Psychological problems – ‘post-fall syndrome’:

- Fear of falling
- Depression
- Loss of self-confidence
 - Social withdrawal
 - Loneliness
- Even if no injury



Consequences

Falls ↓ mobility and independence

↑ hospitalisation and residential care admission

↑ risk of death



Falls are the leading cause of injury related deaths among over 65s (Tinetti et al., New Engl J Med, 2003)

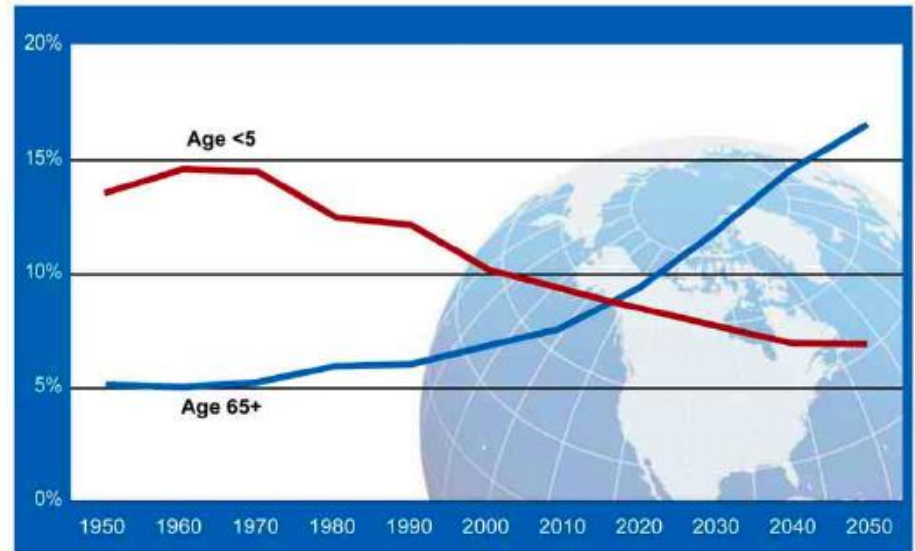


Worldwide,

- 37 million per year require medical attention
- 424,000 per year die due to a fall

Falls are a big problem!

- Prevalent
- Serious consequences
- Costly
- It's going to get worse
- Optometrists can help



Source: United Nations. *World Population Prospects: The 2010 Revision*.
Available at: <http://esa.un.org/unpd/wpp>.

Intrinsic Risk Factors

Age

- Increasing with older age (WHO, 2012)
 - 30% over 65 y
 - 50% over 80 y

Previous falls

- 2-3x as likely to fall again within one year
(O'Loughlin et al., Am J Epidemiol, 1993)

Intrinsic Risk Factors

Women

- Among older old, women more likely to fall than men
- Also more likely to fracture



Intrinsic Risk Factors

Medication

- Psychotropic drugs
- Antihypertensives
- Diuretics
- Polypharmacy: more than 4 of any type



Impaired mobility and gait

- Age-related decline in muscle strength and endurance making it difficult to prevent slip or trip becoming a fall

Sedentary behaviour

- Fallers tend to be less active, but muscle function related to activity



Fear of falling

Intrinsic Risk Factors



Impaired cognitive function

- Need not be severe to increase risk for falls
- Those in residential aged care with dementia fall 2x as often

Intrinsic Risk Factors

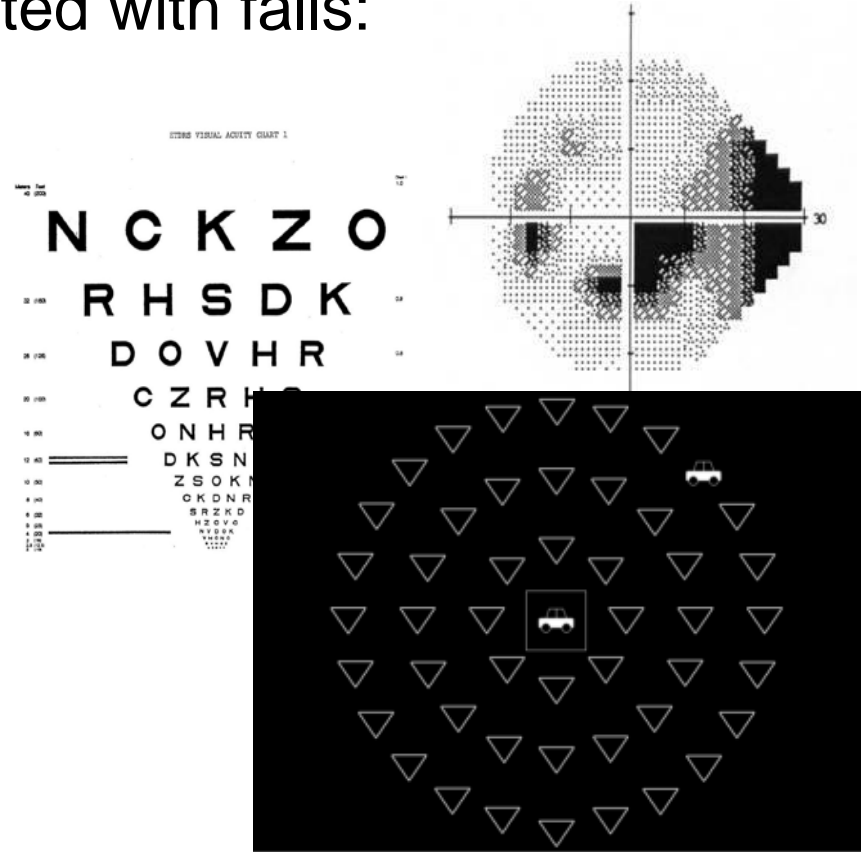
Vision impairment:

is an independent risk factor for falls; and
doubles the risk for falls.



Specific vision factors associated with falls:

- decreased visual acuity
- poor contrast sensitivity
- reduced depth perception
- loss of visual field
- impaired useful field of view



(Black and Wood, Clin Exp Optom, 2005; Lord, Age Ageing, 2006; Dhital et al., Eye, 2010)

Specific vision factors associated with falls:

- multifocal spectacles



(Black and Wood, Clin Exp Optom, 2005; Lord, Age Ageing, 2006; Dhital et al., Eye, 2010)

Specific vision factors associated with falls:

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Normal Progressive

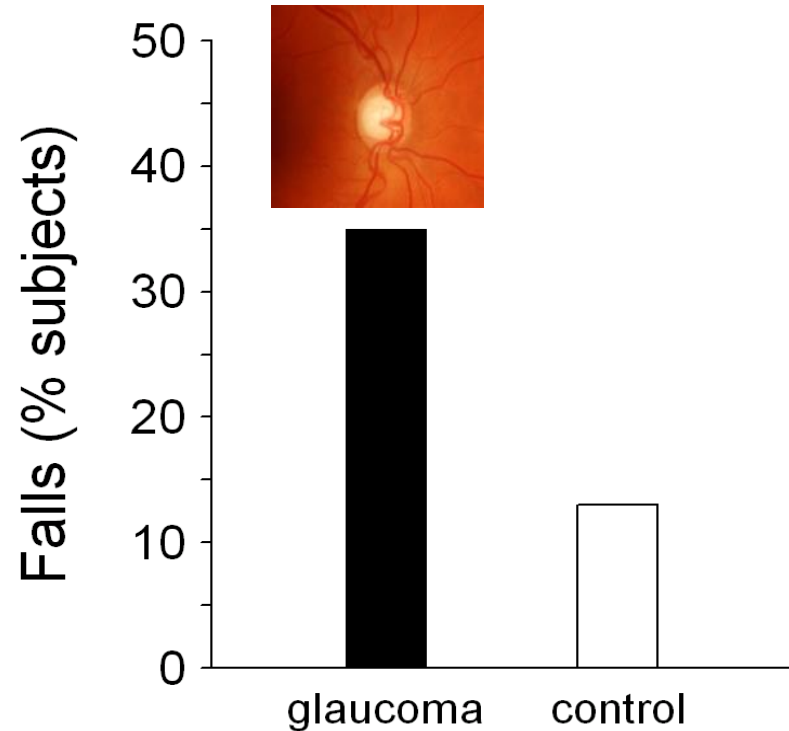


Free-Form Progressive

(Black and Wood, Clin Exp Optom, 2005; Lord, Age Ageing, 2006; Dhital et al., Eye, 2010)

Specific vision factors associated with falls:

- glaucoma
 - OR 3.7 (95%CI 1.1 to 12.1)
- cataract
- AMD



Haymes et al., IOVS, 2007

Extrinsic Risk Factors

Environmental

- Poor lighting, slippery floors, steps, uneven surfaces, loose mats etc.



Footwear and clothing

Inappropriate walking or assistive devices



Vision Interventions

Refractive correction

- Provide an appropriate form of refractive correction that gives best VA
- Stop, ask, consider:
 - when and what are they using specs for?
 - MF vs SV



Vision Interventions

Refractive correction

- Avoid MFs if patient used to wearing SV or have minimal ametropia and used to walking around without specs
- If minimal ametropia but long-term MF wearers, advise that less risk of fall if remove MF when walking outdoors

Refractive correction

- If long-term MF wearers with significant ametropia who take part in frequent outdoor activities, advise SVD when outside, which if tinted would be useful for sunny days
- However, long-term MF wearers with significant ametropia who take part in few outdoor activities should continue to wear their MF for most activities



Show me the evidence

Elliott, Optom in Practice, 2012

Vision Interventions

VISIBLE study (Haran et al., BMJ, 2006)

- 606 community dwelling men and women
- Regular wearers of MFs, at high risk for falls
- mean age 80 (SD 7) years
- Randomised to:
 - SVD with tint for walking and outdoor activity vs. usual care (control)

VISIBLE study (Haran et al., BMJ, 2006)

- Reduction in falls among intervention group who regularly took part in outside activities
- Increase among intervention group who did not regularly take part in outside activities



Refractive correction

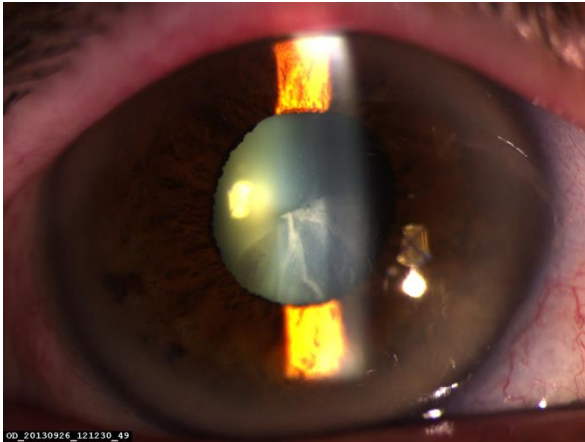
- Provide careful instructions
 - Do not looking through add when walking (especially steps)
 - Don't walk around in reading specs
- Take care with changes in power (caution $>0.75\text{D}$) and cyl axis
 - Warn about magnification changes
- Take care with anisometropia
- Take care with frame selection not to reduce visual field

Vision Interventions

Cataract surgery

- Refer early for first eye
- Consider second eye if hx falls / reduced depth perception

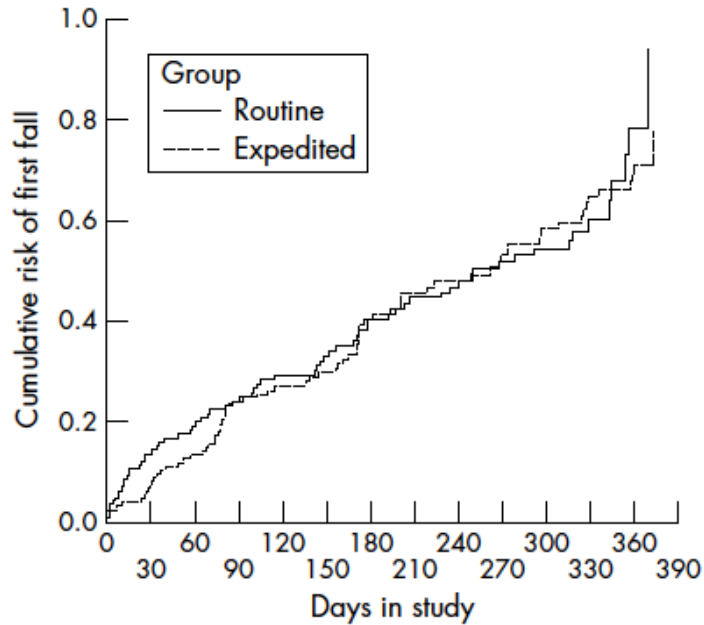
Show me the evidence



Vision Interventions

First eye cataract study (Harwood et al., BJO, 2005)

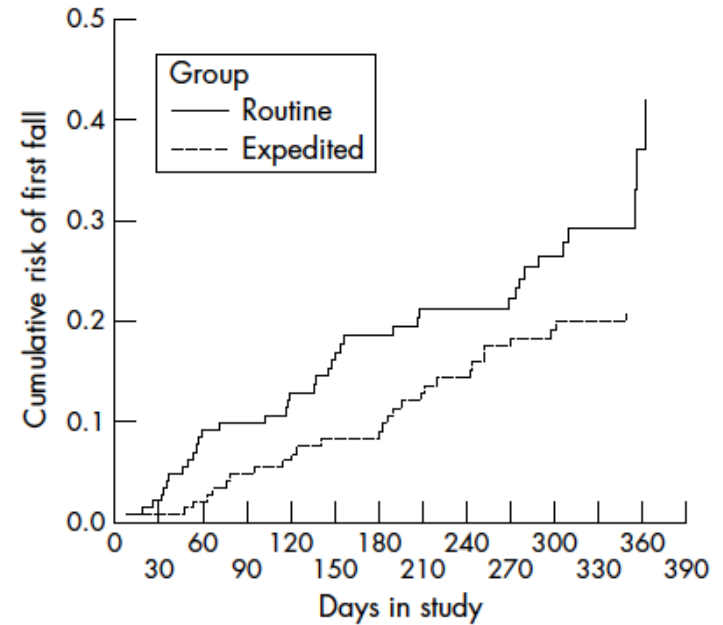
- 306 community dwelling women in UK
- age ≥ 70 (SD 7) years with first cataract
- Randomised to:
 - Expedited cataract sx (4/52) vs. usual wait (12/12)



Numbers at risk

Operated	154	119	97	85	62
Control	152	117	95	79	15

Figure 2 Cumulative risk of first falls.



Numbers at risk

Operated	154	144	135	123	102
Control	152	134	115	98	21

Figure 3 Cumulative risk of second falls.

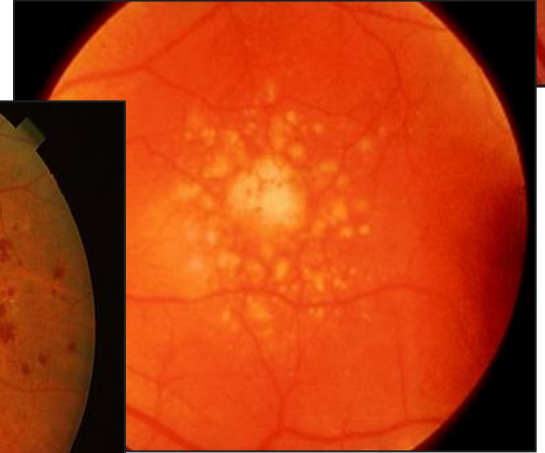
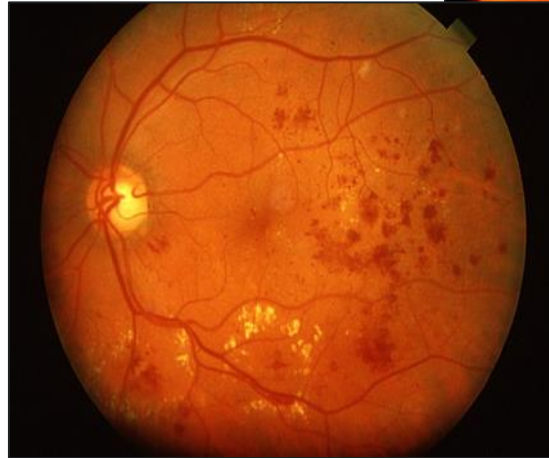
(Harwood et al., BJO, 2005)

- Risk for recurrent falls reduced by 40%

Vision Interventions

Eye disease

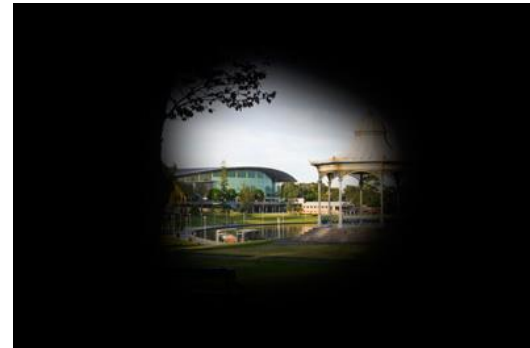
- Detect and manage (e.g. glaucoma, AMD, diabetic retinopathy)
- Refer early to preserve vision



Vision Interventions

Vision loss

- Refer for comprehensive interdisciplinary low vision rehabilitation
(OT, O&M, physiotherapist)



Vision Interventions

Vision loss

- Support cane, long cane, symbol cane



Vision Interventions

Eye health promotion

- Need to have regular eye examinations
- Explain vision-related falls risk factors to general public and other professional groups



i hard fact:
Impaired vision can lead to falls, poor health, and higher levels of depression.

✓ easy action:
visit your optometrist for a comprehensive eye examination; you may need vision correction or you may have undetected eye disease.

1 3 4

The infographic is set against a background image of a woman and a man looking at an eye chart. The chart has letters 'E', 'F', 'P', 'T', 'O', 'E' and numbers '1', '2', '3', '4', '5', '6', '7', '8', '9', '0'. The infographic is divided into two main sections by a large yellow arrow pointing right. The left section is dark grey with white and yellow text. The right section is light yellow with dark grey text. At the bottom, there are four circles containing the numbers 1, 3, 4, and 5, with a white circle between 1 and 3.

General Health and Lifestyle Interventions

Engage with primary care physician and physio

- Review and modification of medications
- Review suitability for exercise program



Show me the evidence

General Health and Lifestyle Interventions

Gillespie et al., Cochrane, 2013

- Systematic review of various interventions for falls
 - Group or home exercise
 - Tai chi
 - NZ Otago Exercise Programme

All involve balance component more than two hours and ongoing



Engage with primary care physician and physio

- Mobility devices
- Footwear
- Falls prevention programs
 - Multifactorial approach



General Health and Lifestyle Interventions

Table 1. Screening tests for balance deficits

Test	Method	Scoring	Interpretation
Single leg stance test	Observe patient standing on one leg with their eyes open on a firm surface for 10 seconds Repeat two more times	1: completed all three trials 2: completed one or two of three trials 3: unable to complete any trials	A score of 2 or 3 indicates significant sensory and strength impairment
Timed Up and Go (TUG) test	Patient to stand from being seated in a chair, walk at a comfortable speed for 3 metres to a line on the floor, turn, return to the chair, and sit down	Time in seconds from beginning to end of test	A time of 15 seconds or longer identifies those with a high risk of falling

Environment Interventions

Home and office

- De-clutter



Environment Interventions

Home and office

- De-clutter



Environment Interventions

Home and office

- Adequate lighting and contrast



Home and office

- Remove trip hazards
 - (e.g. loose rugs / mats / cords)



➤ BUSINESSES NEED TO BE ON THE LOOKOUT FOR

Slip
Trip
& Fall



HAZARDS

ECBM



Environment Interventions

Home and office

- Handrails on stairs and mark edges



Home and office

- Non-slip mats and grab rails in bathroom and toilets
- Emergency no.s should be easily accessed



Effectiveness of home
modifications for vision impaired.
Campbell et al., BMJ, 2005

Summary and Conclusions

Optometrists can help to keep people on their feet

...which will reduce injuries, hip-fractures,
hospitalisations, nursing home admissions, restriction in
activities of daily living, depression, isolation, and deaths
...and increase quality of life and participation.



Summary and Conclusions

- Ask older patients about falls and spectacle use
- Careful prescribing and advice about spectacles



Summary and Conclusions

- Refer for cataract sx
- Detect and manage eye disease
- Refer for interdisciplinary lv rehab
- Encourage regular eye tests



Summary and Conclusions

- Refer for medication mx and exercise program
- Advise on home lighting, contrast and removal of hazards
- Make sure your practice is safe



Thank you
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