Geriatrics and Pain

Objectives

- Identify reasons for falls
- Identify geriatric syndromes & understand the effect of geriatric syndromes in the therapeutic management of the older person
- Be able to implement medication-related falls prevention strategies in the older person in hospital and those living in the community
- Identify causes of delirium in hospitalised patients
- Manage medication-related causes of delirium

S Bennett, June 2013 Clinical Pharmacy Course, University of Peradeniya Sri Lanka

Mrs AA

- 75 year old lady admitted to hospital following a fall
- In significant pain especially when tries to move
- L sided hip pain
- Felt light headed, lost balance when putting away cups in kitchen

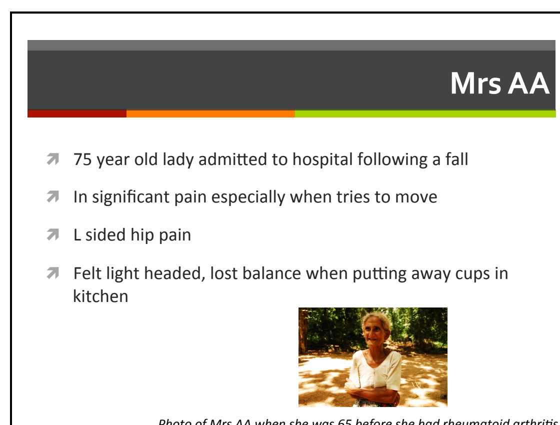


Photo of Mrs AA when she was 65 before she had rheumatoid arthritis

Mrs AA's Past Medical History & Medications

- **Co-morbidities**
  - Reflux disease
  - Hypertension
  - Hypercholesterolaemia
  - Rheumatoid arthritis for over 10 years
  - Hypothyroidism
  - Dry eyes
  - Glaucoma
- **Current medications**
  - Nifedipine SR 20mg mane
  - Atorvastatin 40mg daily
  - Omeprazole 20mg daily
  - Prednisolone 5mg daily
  - Paracetamol 500mg Takes 2 most days for headaches and general aches and pains
  - Levo-thyroxine 100 microgram daily
  - Timolol eye drops 0.5% 1 drop BE bd
  - Lubricating eye drops prn

Further questioning: No allergies known. Mrs AA recently borrowed some of husband's furosemide tablets 40mg as she heard they would help her swollen ankles. Mrs AA has taken 1 tablet in the morning for the last 2 days.

Activity 1: Match the medications with the conditions

Condition	Medication
Hypertension	Nifedipine SR 20mg mane
Hypercholesterolaemia	Atorvastatin 40mg daily
Reflux	Omeprazole 20mg daily
Rheumatoid arthritis	Prednisolone 5mg daily , Paracetamol?
Hypothyroidism	Levo-thyroxine 100 microgram daily
Dry eyes	Lubricating eye drops prn
Glaucoma	Timolol eye drops 0.5% 1 drop BE bd
Unknown? Undiagnosed?	Paracetamol 500mg ? Takes 2 most days for headaches and general aches and pains

Some Facts about Falls

- Definition: An unexpected event in which a person comes to rest on ground, floor or lower level
- 1/3 of 65+ fall/year; ↑ age, ↑ falls
- Leading cause of trauma-related admissions to ED in 65+ & 50% of these hospitalised
- Cause 95% of hip #s
- Those with # have ↑ risk of subsequent fall & #; ↑ risk of surgery (↑ length of hospital stay, ↑ complications)
- Fear of falling, reduced activity
- Loss of quality of life/independence/well being; ↑ institutionalisation

Risk Factors for Falls

Intrinsic	Extrinsic
Chronic health conditions eg stroke, Parkinson's disease, arthritis, dementia	Uneven or slippery surfaces
Sensory loss	Poor lighting
Medications & polypharmacy	Loose rugs
Incontinence	Unsafe footwear
Balance & gait impairment	Use of assistive devices
Previous falls	

Does Mrs AA have any of these?

Activity 2: Mrs AA's Risk Factors for Falls

Intrinsic (Arthritis)	Extrinsic (Question Mrs AA & family to check extrinsic factors)
Chronic health conditions eg stroke, Parkinson's disease, arthritis, dementia	Uneven or slippery surfaces
Sensory loss (Yes eye conditions)	Poor lighting
Medications & polypharmacy (Yes)	Loose rugs
Incontinence	Unsafe footwear
Balance & gait impairment	Use of assistive devices eg walking stick
Previous falls	

Also could have muscle weakness if hypothyroidism not treated

Falls Risk Increasing Drugs

Anxiolytics/hypnotics	Antihypertensives (all classes)
Neuroleptics	Anti-arrhythmics
Antidepressants (TCAs, SSRIs, SNRIs, MAOIs)	Nitrates & other vasodilators
Analgesics esp opioids	Digoxin
Anticholinergics & antihistamines	Beta-blocker eye drops
Antivertigo drugs	Hypoglycaemics

Does Mrs AA use any of these types of medications?

Activity 3: Identify Mrs AA's medications which may lead to falls

Medication	Fall-related adverse effects (Aust Medicines Handbook)
Furosemide	Common: Dizziness, orthostatic hypotension
Nifedipine SR	Common: dizziness
Atorvastatin	Common: dizziness; Rare- myopathy
Omeprazole	Infrequent: dizziness
Prednisolone	Common: muscle weakness/wasting with long term use
Levo-thyroxine	
Lubricating eye drops	Blurred vision post-instillation possible, especially ointments
Timolol eye drops 0.5%	Infrequent: hypotension, syncope
Paracetamol 500mg	

Note: Increasing dose will usually increase risk of falling

Activity 4: Identify Mrs AA's meds which may lead to swollen ankles

Medication	Peripheral oedema-related adverse effects (AMH)
Furosemide	
Nifedipine SR	Common: peripheral oedema
Atorvastatin	
Omeprazole	Rare: peripheral oedema
Prednisolone	Common: salt & water retention, oedema
Levo-thyroxine	
Lubricating eye drops prn	
Timolol eye drops 0.5%	
Paracetamol 500mg	

Education/ counselling for Mrs AA

- Given timeline Mrs AA's fall likely due to recent use of furosemide
- Educate Mrs AA re use of furosemide- to cease
- Counsel re management of swollen ankles- reasons (likely nifedipine & prednisolone) & solutions (treatment will produce more harm than benefit; not serious side effect; put feet up whenever possible; consider pressure stockings; if unacceptable consider other antihypertensive)
- Educate re use of other people's medications is unwise

Common patient complications post falls & fractures

- Delirium
- Pressure areas
- Urinary incontinence, urinary retention, UTIs
- Poorly controlled pain
- Polypharmacy
- VTE

Goals: hospital care of patients with falls/fractures

- Nil medical complications
- Early mobilisation
- Optimal pain relief
- No/Low incidence of pressure areas
- Prevention of further falls
- No delirium
- Osteoporosis detected & treated

For consideration

- VTE Prophylaxis: Patients with fractures have high risk of VTE
  - Promote early mobilisation where possible
  - Mechanical: eg compression stockings
  - Chemoprophylaxis: consider contra-indications
- Pressure Ulcer Prevention
  - Waterlow risk assessment including meds
  - Handling, mobility, pain management
- Nutrition
- Osteoporosis
- Pain management

Investigations following falls

- Medical & social history
- Falls history; extrinsic risk factors for falls
- Cognitive function & other geriatric syndromes?
- Level of pain pre & post analgesia; on-going needs; opioid-naïve?
- Monitoring for ADRs, particularly newly prescribed:eg sedation
- Biochemistry: PTH, 25-OH Vit D, TFTs, LFTs, serum creatinine & urea, FBC
- Radiology: X-ray; Dual-Energy X-ray Absorptiometry (DEXA) of spine & hip?

Mrs AA's progress

- Investigations**:** Pelvic X-ray shows left inferior fracture of pubis ramis (pelvis). The orthopaedics team is consulted and as the fracture is stable, she is allowed to walk and weight bear as pain permits. She is to stay in hospital until investigations are completed and pain is under control.
- Mrs AA is prescribed morphine 15mg four times daily and 2.5-5mg when required (prn). Paracetamol is increased to 1g four times daily, diazepam 2.5mg daily prn for sleep.
- Day 4: During ward round, Mrs XX seems distracted, not wanting to be mobilise at all. The nurse says she has been calling out and agitated and has been having increased 'prn' morphine.

Common patient complications post falls & fractures

- Delirium — Mrs AA could be suffering this
- Pressure areas
- Urinary incontinence, urinary retention, UTIs
- Poorly controlled pain — Mrs AA could be suffering this
- Polypharmacy — This has increased
- VTE

What is delirium?

- A transient mental disorder, characterised by impaired cognitive function and reduced ability to sustain or shift attention.
- Develops over a short period of time and generally fluctuates during course of day.
- Usually only last few days but may persist weeks- months
- Common, preventable, affects < 30% older hospitalised patients,
- Often unrecognised: fluctuating nature, dementia overlap, lack of formal cognitive tests, failure to consider diagnosis, lack of appreciation of consequences
- Associated with high mortality rate at 1 yr, institutionalisation, complications

Risk Factors for Developing Delirium

Cognitive impairment/dementia	Polypharmacy
Surgery eg NoF #	Physical frailty
Fracture/trauma	Visual impairment
Age $\geq$ 70 yoa	Renal impairment
Severe illness	Dehydration/malnutrition
Admission with infection/dehydration	Alcohol excess
HIV	Depression

ACI Orthogeriatrics Model of Care 2010

Does Mrs AA have any of these?

Activity 5: Mrs AA's Risk Factors for Developing Delirium

Polypharmacy	Takes 6-7 medicines each day
Physical frailty	Muscle wasting from prednisolone?
Fracture/trauma	Pubic ramus fracture
Age $\geq$ 70 yoa	75 yoa
Visual impairment	Glaucoma
Admission with dehydration?	Use of furosemide?
Renal impairment?	Possibly given her age & co-morbidities eg hypertension

Precipitating Factors for Developing Delirium

Infection eg pnuemonia	Psychoactive medications
Immobility	Opioids
Fever/ hypothermia	Elimination malfunction
Concurrent illness eg MI, haemorrhage	Use of urinary catheter
Use of mechanical restraint	Iatrogenic events including ineffective pain management
Hypoxia	Sleep deprivation
Metabolic derangement	Anaemia
Unfamiliar environment	

ACI Orthogeriatrics Model of Care 2010

Does Mrs AA have any of these?

Activity 5 Mrs AA's medication causes of delirium

Medication	Delirium-related adverse effects (Aust Medicines Handbook)
Morphine	Infrequent: confusion, hallucinations, delirium, agitation, mood changes
Diazepam	Infrequent: disorientation, confusion, memory loss
Nifedipine SR	
Atorvastatin	
Omeprazole	
Prednisolone	Common: mood & cognition disturbances; Less common: delirium
Levo-thyroxine	
Lubricating eye drops	
Timolol eye drops 0.5%	Infrequent: confusion, hallucinations
Paracetamol 500mg	

Activity 6 Precipitants for Mrs AA developing delirium?

Diazepam	How much has been used?, review need; consider non-pharmacological management
Morphine – too much or too little	Likely medicine culprit; assess pain management, review dose
Constipation?	Mrs AA should have been prescribed an aperient eg senna when morphine was prescribed
Unfamiliar environment	Enlist help of family
Assess other risk factors	See next slide to rule out other causes

ACI Orthogeriatrics Model of Care 2010

Assessment of delirium

History*	Examination	Investigations
Medication, alcohol	Vital signs	Urinalysis
Dietary & fluid intake	Mental state	FBC
Falls	Neurological	Renal function
Infection	Chest	Glucose
Bladder & bowel fn	Abdomen (retention, impaction)	Calcium
Premorbid cognitive & functional status	Skin- lesions, dehydration	Liver function
Medical & social		CXR
Sensory input		ECG, cardiac enzymes
		Others if indicated eg TFTs, cultures

*may require family/ carer input

Prevention & Treatment of Delirium

- **Non-pharmacological**
  - Make environment calmer/more familiar & comfortable: remove pump alarms; have family/carers caring & communicating; bring in items from home; activities that are reduce anxiety- frequent reassurance
  - Prevent sleep deprivation
  - Help orientation (reorientation): clocks, calendars; appropriate lighting; eyeglasses & hearing aids

Medical treatment/prevention of delirium

- Fluid & electrolyte balance
- Bowel and bladder maintenance
- Reduction in use of psychoactive drugs
- Regular pain relief
- Nutritional enhancement
- O2 saturation maintenance
- Early mobilisation
- Prevention of post-op complications
- Try to avoid antipsychotics unless hallucinations/safety of others threatened/care hindered- eg haloperidol 0.25-5mg preferably PO; risperidone 0.25-0.5mg . Benefits vs risks (falls, hypotension, stroke & SCD via QT prolongation)

www.health.vic.gov.au/acute-agedcare

What else needs to be assessed before Mrs AA can leave hospital?

- Prevention of further falls
- Osteoporosis detection & treatment, if diagnosed

Falls prevention plan

- Balance training & exercise eg Tai Chi
- Extraction of cataracts, removal multifocal/bifocal glasses
- Med review
- Prevention of falls: Vit D if deficient
- Hip protectors: poor compliance
- Hazard reduction at home
- Treatment for osteoporosis (OP) if diagnosed (with DEXA)

Risk factors/predictors for osteoporosis

Major

- Falls
- Previous fracture

Non-modifiable

- Age
- Sex
- Ethnicity
- Reproductive factors
- Family history of osteoporosis

Modifiable

- Low BMI/ weight
- Smoking
- Alcohol
- Exercise
- Diet

Secondary Risk Factors for OP

	Vitamin D Deficiency	Inflammatory Bowel Disease	
Vit D needs to be measured	Anorexia nervosa	Renal disease	Mrs AA may have this
	Chronic liver disease	Long term corticosteroid use	Mrs AA has this
	Hyperparathyroid disease	Rheumatoid arthritis	Mrs AA has this
	Coeliac disease	Male hypogonadism	

Fracture risk reduction in glucocorticoid-induced osteoporosis

- Estimated 50% of pts taking glucocorticoids have OP by 6 months
  - Reduced bone formation, increasedbone resorption
  - Reduced calcium gut absorption & increased renal excretion
- Fractures seen at higher bone mineral densities in patients on glucocorticoids than those not on them
- General principle: use the lowest effective dose of glucocorticoid for shortest period of time for prevention of glucocorticoid ADRs
- Assess fracture risk when prednisolone ≥ 5mg/day use > 3 months
- Calcium & Vitamin D supplementation recommended for prevention
- Consider bisphosphonates

Mrs AA should have been taking Calcium & Vit D & possibly bisphosphonate before she had her fall

Treatment of osteoporosis

- Non-pharmacological- combination best: wt-bearing exercise, environmental hazard review, med review, cognitive assessments, dietary change, hip protectors
- Pharmacological
  - Calcium
  - Calcium plus Vit D
  - Bisphosphonates
    - Decrease bone turnover & preserve bone mass by inhibiting resorption by osteoclasts
  - SERMs eg raloxifene
    - Increase BMD hip & spine but no evidence for non-vertebral #s

Mrs AA had a number of geriatric syndromes

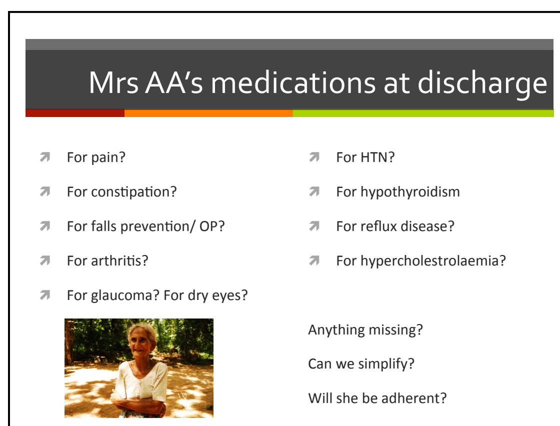
- Multifactorial & common clinical conditions among older people predisposing them to disability & death
- 50% > 65 yoa have ≥ 1 geriatric syndrome
- Includes: Green= the geriatric syndromes Mrs AA has experienced

Frailty	Falls & fracture	Immobility
Dementia & cognitive impairment	Depression, apathy, self-neglect	Geriatric heart disease
Delirium	Functional decline	Insomnia
Incontinence	Dizziness & vertigo	Malnutrition
Impaired hearing & vision	Osteoporosis	Pressure ulcers

Strandberg T et al Ann Int Med 2012

Mrs AA's medications at discharge

- For pain?
- For constipation?
- For falls prevention/ OP?
- For arthritis?
- For glaucoma? For dry eyes?
- For HTN?
- For hypothyroidism
- For reflux disease?
- For hypercholestrolaemia?



Anything missing?

Can we simplify?

Will she be adherent?

Continuity of medication for patients admitted to hospital

- Obtain best possible medication* history
- Review patient's medications* on admission
  - Consider indication for each medication: beneficial, risk of adverse effect, high risk in older patient?
  - Withhold, cease, continue? Prioritise, discuss with other clinicians and patient, family
  - Monitor the patient for adverse effects post medication cessation
- Commencing medicines in hospital
  - Indication and goal of treatment, potential for adverse effects, patient consent
  - Monitor for effect and adverse effects

**prescription, OTC and complementary*

Medications at discharge

- 'Reconcile' medications (look at meds at admission, those initiated in hospital or planned for initiation, clarify any discrepancies) & develop accurate & comprehensive discharge medication list;
- Final review- rationale, simplification?, adherence post-discharge?
- Supply?
- Counsel, especially new medications
- Communicate with & supply medication list to patient/family & next attending health care professionals

Further reading & references

- **General**
  - Aust Medicines Handbook Drug Choice Companion: Aged Care
  - Aust Medicines Handbook
- **Falls/ Fractures**
  - NSW Agency fro Clinical Innovation (AC) Aged Health Network Orthogeraitric Group. Model of Care: Summary of Evidence 2010 & Clinical Practice Guide
  - www.osteoporosis.org.au
  - https://www.mja.com.au/sites/default/files/issues/002_01_040213/MJA%20OpenSupplement.pdf
- **What hospitals can do to prevent falls:**
  - http://www.safetyandquality.gov.au/publications/rtf-safety-and-quality-improvement-guide-standard-10-preventing-falls-and-harm-from-falls/
- **Best practice guidelines**
  - http://www.safetyandquality.gov.au/former-publications/falls-preventing-falls-and-harm-from-falls-in-older-people-best-practice-guidelines/
- **Vitamin D deficiency**
  - http://www.nps.org.au/conditions-and-topics/conditions/hormones-metabolism-and-nutritional-problems/vitamin-deficiency/vitamin-d-deficiency

Further reading & references

- **Pain**
  - Aust & New Zealand College of Anaesthetists & Faculty of Pain Medicine. Acute pain management: scientific evidence.www.anzca.edu.au
- **Delirium**
  - Brown, TM ; Boyle, MF . ABC of psychological medicine – Delirium. BMJ 2002 Volume: 325 Issue: 7365 Pages: 644-647
  - Mittal, Vikrant; Muralee, Sunanda; Williamson, Deena; et al. Delirium in the Elderly: A Comprehensive Review American Journal Of Alzheimers Disease And Other Dementias 2011 Volume: 26 Issue: 2 Pages: 97-109