Comprehensive Assessment of a Fall

History

- As with most of medicine – and geratology particular – history plays an important factor when performing an assessment of a patient who has fallen. The structure below is particularly important in the context of falls:
- **Before the fall**
    - Any pre-syncopal symptoms e.g. feeling dizzy, light-headed, palpitations?
    - What were they doing?
        - Getting up from lying/sitting (postural hypotension?)
        - From the toilet (vasovagal?)
        - In the middle of walking (arrhythmia?)
        - Turning their head (carotid sinus hypersensitivity?)
    - How is their general health? Any infective symptoms (e.g. dysuria, cough, cellulitis?)
    - How do they usually mobilise? Do they walk independently or use a stick/sticks/frame/need supervision (implying underlying frailty and poor mobility?)
- **During the fall**
    - Do they remember falling?
    - Was it witnessed?
        - If so, obtain a detailed collateral history
        - If not, assume that there may have been some loss of consciousness (LOC)
    - Was there any LOC?
    - Are they able to describe the mechanism of the fall?
        - If they say they 'must have tripped' this is not the same as remembering a definite mechanical reason for the fall!
    - Where they able to put out their hands to prevent injury?
        - A fractured wrist where they have tried to protect themselves is consistent with **no LOC**
        - A significant head (e.g. black eye) is consistent with no attempt to protect themselves, and as such LOC (likely sudden onset – e.g. arrhythmia) prior to the fall.
- **After the fall**
    - Any limb jerking or urinary/faecal incontinence to imply seizure?
        - Some myoclonic jerking following a syncopal episode is not uncommon, so do not read too much into this
    - Were they well-oriented following the fall?
        - Rapidly recovering orientation is in keeping with no LOC, or syncopal episode
        - Persistent confusion/drowsiness implies a post-ictal state and potential seizure as cause
    - Were they able to mobilise independently following the fall?
        - If not, and secondary to pain, be on the lookout for bony injuries
        - Confused patients can often fail to localise pain
    - How long were they on the floor for?
        - The longer the lie, the higher the risk of rhabdomyolysis: ensure as CK is checked

Past Medical History

- Diabetes Mellitus
    - Are they good at detecting hypoglycaemia?
    - Was a blood sugar checked at the time of the fall?
    - Any history/evidence of peripheral neuropathy that might be contributing to falls risk?
- Hypertension
    - Are they on multiple anti-hypertensives which might be leading to postural hypotension
- Epilepsy
    - Do they have a history of seizures?

    - If so, how well controlled are the seizures and are they compliant with anti-epileptic medications?
- Previous falls
    - Have they had other falls (even "small" ones that didn't require admission)?
    - How does this one compare to the previous ones? Is it a similar story?
- Cardiac History
    - History of palpitations/ECG-confirmed arrhythmias
    - Do they have a copy of an old ECG?
        - If your patient as an abnormal ECG, giving them a copy to take home with them in future is useful, as they can show it to future admitting doctors to allow comparison
    - Ischaemic heart disease or other underlying cardiac problems that might mean the patient is on beta-blocker
- Other neurological History
    - Any previous stroke/neurological disorder that has left them with a persistent focal deficit, and hence frailty that might be contributing to the falls risk
    - History of tremor/shuffling gait/rigidity to imply Parkinsonism
- Continence History
    - Issues with incontinence/overactive bladder can lead to falls as patients often try to mobilise late at night to the toilet in the dark
- State of vision
    - History of glaucoma or age-related macular degeneration, which might leave them visually impaired?
- Cognitive Impairment?
    - Patients with dementia are at increased risk of falls, secondary to a lack of self-awareness over danger/obstacles to mobilisation
    - Evidence of recurrent visual hallucinations (LBD associated Parkinsonism)
- Bone Health
    - Evidence of previous fractures
    - Evidence of osteoporosis and risk of fragility fractures
- Drug History
    - Anti-hypertensives
        - May lead to postural hypotension
    - Alpha-receptor blockers in male patients with prostatism
        - E.g. tamsulosin
        - Can cause a profound postural drop in BP
    - Antihyperglycaemics
        - Use of insulin or sulphonylureas can cause hypoglycaemic events
    - Analgesia
        - Side-effects of drowsiness can increase the risk of falls
        - Evidence of poor-pain control can imply frailty and poor mobility
    - Bone Protection
        - Vitamin D replacement
        - Calcium replacement
        - Bisphosphonates
    - Steroid Use
        - E.g. long-term use in COPD with multiple exacerbations or in polymyalgia rheumatic (PMR)
        - Associated with increased risk of fragility fracture secondary to effects on bone
        - Long-term use associated with proximal myopathy, and subsequent frailty-associated falls risk
    - Diuretics
        - Use of diuretics is associated with increased urinary frequency, and the associated issues with continence as discussed above

        - Check the timings of administration, and try to not prescribe your diuretics in the evening if possible (if BD dosing, give the second dose at lunchtime) – this will help to avoid nocturnal micturition
    - Anti-epileptics
    - Anti-cholinesterase inhibitors
        - Implies the diagnosis of dementia (if not already established from past medical history)
        - Associated with increased risk of syncope (and hence syncope-related falls)
    - Anti-coagulants
        - Risk of bleed (e.g. subdural haematoma) if patient on warfarin or novel oral anticoagulant (NOAC)
        - Have a lower threshold for a CT head
    - Psychotropic Drugs
        - E.g. SSRIs, benzodiazepines, dopamine antagonists can all increase the risk of falls
- Social History
    - House/flat/bungalow
    - Stairs and associated equipment (e.g. stair rails, stair lift)
    - Upstairs/downstairs toilet/commode
    - Who else is at home with the patient
    - Any pre-existing package of care (POC)
    - Level of independence for activities of daily living (ADLs)
    - Alcohol history
        - Potential associated alcohol neuropathy
        - Intoxication-related falls
        - If history of dependence, offer support to help quit, and monitor for withdrawal
    - Smoking history
        - Should always form part of every social history
        - Again, offer support to help quit
    - Who does cooking/shopping/cleaning of house?
    - Do they have a pendant alarm?
    - Do they have a key safe?
- Systems Enquiry
    - The multi-factorial nature of most geriatric falls means that a systems enquiry has already been performed during the above history

Examination

- A full formal clerking should then be performed to assess for both any sign of injury as a result of the fall, but also to gain a better understanding into possible causes.
- On a system-by-system basis, here are a few things to keep in mind and look out for.
- **Cardiovascular**
    - Pulse
        - Regular/irregular to imply AF or intermittent heart block?
        - Strong or weak (weak may suggest underfilling)?
    - Blood pressure
        - Always try to obtain 3 postural (lying to standing) blood pressure readings
        - Ensure they are taken correctly (do not settle for a “lying to sitting”)
    - Murmurs
        - ESM to imply aortic stenosis as a cause of syncope?
        - PSM to imply MR and CCF/AF from atrial dilatation
- **Respiratory**
    - Evidence of LRTI/pneumonia as an underlying infection?
    - Evidence of chronic respiratory problems leading to SOB and increased frailty?

- Equal, pain-free air entry?
    - Inspiration can be limited by the pain from fractured ribs from the fall
    - Hypoventilation (and associated atelectasis) due to pain is a risk factor for pneumonia
- **Abdominal**
    - Evidence of constipation that might be leading to a delirium?
    - Evidence of an enlarged bladder (urinary retention) leading to a delirium?
- **Neurological**
    - Please do not document neurology as "grossly normal"
        - "Grossly normal" equates to "couldn't be bothered to examine"
    - Instead, do a formal neurological examination for:
        - Evidence of stroke/disability from previous stroke
        - Cerebellar signs to imply balance is impaired
        - Peripheral neuropathy from alcohol or diabetes that reduces proprioception and balance
        - Check their gait and use of walking aids

Investigations

- **ECG**
    - Look for any evidence that could be predisposing them to syncope e.g. heart block, arrhythmia, over-treatment with beta-blockade
- **Blood glucose**
    - Evidence of diabetes or hypoglycaemia
- **Urine dip**
    - Evidence of UTI as source of infection
    - If legs are particularly oedematous (and hence contributing to the risk of falls) look for urinary protein
- **Blood tests**
    - FBC
        - Anaemia leading to shortness of breath on exertion
        - Raised white count to imply infection
        - High MCV to imply B12 deficiency (and potential associated peripheral neuropathy)
    - Urea and electrolytes
        - Uraemia or other metabolic disturbance leading to confusion
    - CRP
        - Underlying infection
    - Calcium and phosphate
        - Evidence of bone pathology e.g. myeloma which is causing pain, and hence increasing falls risk
    - Liver function
        - Evidence of alcohol abuse
    - Clotting
        - Especially if on warfarin
        - Abnormally high INR may increase your suspicion of causative or resultant intracranial bleeds
        - If low, be on the lookout for corresponding complications (e.g. stroke for AF, PE for VTE)
    - Other blood tests may be indicated based on your findings so far from history and examination
        - E.g. TFTs if evidence of hyper- or hypothyroidism
- The above list is not exhaustive, and should be tailored towards your suspected diagnosis
- **Imaging**
    - Chest x-ray
        - Evidence of infection as a cause of the fall

        - Can also confirm rib fractures which will require adequate analgesia to allow good, deep respiration and hence reduce the risk of subsequent infection
    - CT Head
        - Although there are national trauma guidelines over who should receive a CT head in the emergency department, it is reasonable to have lower threshold for a CT head in the elderly population
        - Subdural haematoma is a not uncommon cause of confusion in the elderly (even without a clear history of trauma, especially if on anticoagulants)
        - This is particularly important if the patient is frail and likely to be an in-patient on thromboembolic prophylaxis for several days

Management of patients with falls: In-patient, discharge, and follow-up

- Immediate inpatient management will clearly depend on findings of above history, examination and investigations.
- Management should be multidisciplinary: including doctors, nurses, physiotherapists and occupational therapists.
  General geriatric management strategies include:
- **Inpatient**
    - Identify those who are at high risk of further falls to help reduce the chance of an in-patient fall
        - 1-1 nursing may be required for confused/delirious patients
        - Low-rise beds and mattresses on the floor to reduce the risk of injury
        - Non-slip socks
        - Adjustment of medication regimens to reduce falls risk
    - Training how to use appropriate walking aids is very important to help reduce falls
- **Additional support**
    - POC if going back home
    - May require placement to ensure safety, either RH or NH based on level of dependence
- **Outpatient**
    - Home visits can be helpful in frail patients who might have cluttered houses with uneven floors
    - Modification of the home environment
        - Downstairs living
        - Commode
        - Hand rails
        - Stair lift
        - Hospital bed
        - Hoist
    - Pendant alarms
        - Newer models have in-built impact sensors that are set-off as a fall happens
- **Follow-up**
    - Specialist geriatric clinic follow-up
    - Falls clinic
    - Balance classes