West Midlands Parkinson's Network 2016

# Parkinson's and Falls. Tips & Resources.

Contents:




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# Why do people with Parkinson's fall?

Falls in people with Parkinson's are very common. 60% of people with PD have at least one fall per year, with 39% of patients who fall doing so recurrently[1]. Fear of falling is disabling and also increases falls risk in and of itself. In addition, people with Parkinson's have significantly increased risk of osteoporosis[2], resulting in people with Parkinson's having triple the risk of hip fracture compared to controls[3]. Falls risk changes during the course of PD, and often becomes a problem at the time when other complications such as cognitive impairment also start to become a problem.

As with most (older) people with falls, the causes are multi-factorial. Many contributing factors to falls are generic to all patient groups. However, people with PD have additional PD specific factors to address. Therefore, if these patients are seen within general falls services rather than PD specific falls services, there needs to be an understanding of where/when to seek help from the specialist teams. Successful falls prevention requires a multi-disciplinary and multi-faceted approach, with consideration given to all potentially modifiable risk factors. **Note that falls should not be prevented at all costs** – eg. a patient kept in bed in order to reduce falls risk whilst in hospital will rapidly de-condition and develop additional problems.

**So what is different about PD patients?**

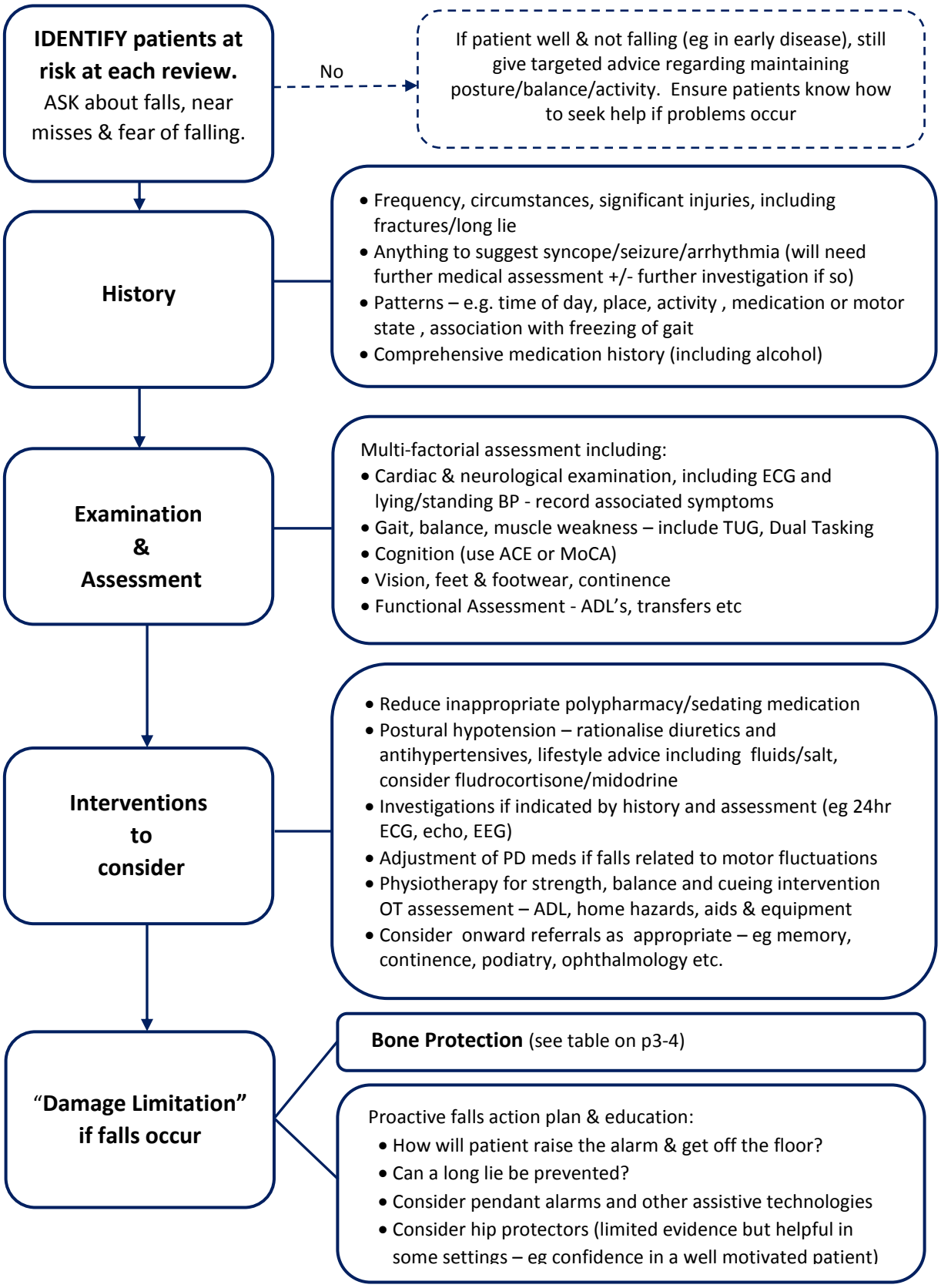
In addition to the many generic falls risks, people with PD also have:

- **Gait dysfunction**
  1. **Continuous** – reduced gait speed, arm swing & step length. Increased asymmetry & variability.
  2. **Episodic** – freezing, festination. Freezing is a potent risk factor for falls
- **Balance dysfunction**
  - Abnormal posture, increased sway, inability to change sensory weighting, reduced limit of stability, postural strategies to perturbation altered, anticipatory adjustment abnormal.

*With thanks to Dr Emily Henderson for sharing her slide from which this information is taken[4].*

| Potentially Modifiable Risk factors to Falls in PD | |
|---|---|
| **Generic** | **PD Specific** |
| • Inappropriate polypharmacy & sedative medication<br>• Postural hypotension<br>• Arrhythmia<br>• Arthrosis<br>• Improper use of walking aids<br>• Anxiety/fear of falling<br>• Weakness due to inactivity or malnutrition<br>• Visual/oculomotor impairment<br>• Daily alcohol<br>• Environmental hazards<br>• Other co-morbidities (eg vertigo, neuropathy)<br>• Depression (?medication related)<br>• Osteoporosis | • Disease severity<br>• PD medication (eg anticholinergics, high dose L-D)<br>• Slow mobility<br>• Shuffling, small stepping gait<br>• Freezing of gait & festination<br>• Posture<br>• Postural instability<br>• Difficulty with transfers<br>• Cognitive impairment<br>• Axial rigidity<br>• Dyskinesia<br>• Dual tasking (PD pts have dysexecutive problems)<br>• Nocturia (associated with nocturnal falls)<br>• Loss of arm swing |
| ***Details regarding evidence base and suggested approach for each factor available in following paper:*** Van der Marck et al. Consensus-based clinical practice recommendations for the examination & management of falls in patients with Parkinson's Disease[5]. | |

# Flowchart for MDT Falls Assessment in PD




**Note: This algorithm is intended for use in the STABLE OUTPATIENT setting**. PD patients presenting acutely with falls will need to have additional consideration of acute medical issues precipitating the fall (eg delirium, sepsis, cardiac event, haemodynamic compromise or electrolyte disturbance).

# Algorithm for Bone Health in PD patients (1).

**All Outpatients (in primary and secondary care)** **SEE NOTES**
**with diagnosis of Parkinson's Disease or a related movement disorder.**
This guidance is not applicable in end stage disease when a patient is bedbound/hoist dependant or life expectancy under 6 months.

| | | | | |
|---|---|---|---|---|
| **Step 1** | **Calcium & Vitamin D** | Check dietary calcium. If insufficient prescribe supplement.<br>Measure baseline vit D level. Replace if deficient/insufficient. Start maintenance. | | |
| **Step 2** | **Record** | 1. Falls (no. in past year)<br>2. Prior fragility fracture<br>3. Back pain (consider X ray) | | |
| **Step 3** | **Q Fracture Score** | 10 year probability of major osteoporotic fracture (MOF) and Hip Fracture (#NOF) | | |
| **Step 4** | **10-year probability** | ≥5% #NOF<br>Or ≥ 20% MOF | | <5% #NOF and<br><20% MOF |
| **Step 5** | **Age** | Over 75 | 75 or younger | Calculate FRAX*<br>NOGG advice**<br>Amber / Green |
| **Step 6** | **DXA/Treat** | No DXA | Baseline DXA<br>Start treatment pending DXA | Request DXA & recalculate FRAX with BMD***<br>Red / Green |
| | | **TREATMENT & LIFESTYLE ADVICE** | | **LIFESTYLE ADVICE** |

**LIFESTYLE ADVICE:**
Smoking cessation, alcohol reduction, weight-bearing exercise, diet, calcium & vitamin D
Falls prevention strategies; consider hip protectors.

**TREATMENT (see notes):**
First line: oral bisphosphonate (weekly or monthly)
Second line: consider iv zolendronic acid/ subcut denosumab

Review fracture risk annually; or after 5y if on treatment. Assess **compliance** at each appointment.
Review sooner in the case of a new fracture, or deterioriation towards a more palliative disease phase.

Resources: www.shef.ac.uk/FRAX www.qfracture.org www.nos.org.uk

Abbreviations: DXA: dual X-ray absornbitometry; NOGG: National Osteoporosis Guidelines Group;
BMD: bone mineral density; NOS: National Osteoporosis Society.

Age Ageing 2015; 44(1):34-41. Dr Veronica Lyell Updated Feb 2016

# Algorithm for Bone Health in PD patients (2)

**NOTES:**

**Step 1:** **NOS 'Healthy Bones – facts about food' leaflet guides dietary requirements**
**Vitamin D replacement:** Cholecalciferol 40,000iu once weekly for 7 weeks if deficiency (<30nmol/l)
Cholecalciferol 20,000iu once weekly for 7 wks if insufficiency (<50nmol/l)
**Vitamin D maintenance:** Ca/Vit D preparation (eg Calceos † bd)
Or if high calcium diet Fultium † od

**Step 2:** Acute back pain should trigger X-ray investigation for vertebral fracture
If falls, consider contributing causes. *Move on to step 3 even if no falls/fractures.*

**Step 3:** **www.qfracture.org**
Q fracture calculates fracture risk for any period from one to ten years.

**Step 5:** Consider 'physiological' age when using the 75yrs treatment threshold.
***FRAX** **www.shef.ac.uk/FRAX**
****NOGG** connect to NOGG advice direct from FRAX website
If falls reported in the last year, inflate the FRAX calculated MOF risk by 30% per fall

**Step 6:** *****BMD** **I**f Q fracture score above threshold in under 75yrs, treat pending DXA result.
If BMD is known, calculate FRAX by including hip BMD value
If falls in the last year, inflate FRAX calculated MOF risk by 30% per fall (maximum 150%)

**Treatment options.** Calcium and vitamin D supplements should be co-prescribed with all anti-resorptives

**First line oral treatment**
Alendronate 70mg weekly *if no GI symptoms and eGFR >30ml/min*
Risedronate 35mg weekly *if mild, non-specific GI Sx and eGFR is >30ml/min*
**Second line oral treatment**
Ibandronate 150mg monthly *if once monthly dosing more practical*
*Licensed in postmenopausal women with vertebral fractures only*

**Second line parenteral treatment options (referral to rheumatology services)**
Annual iv zolendronic acid (for 3 years) *if first line agents contra-indicated/not tolerated and GFR>35ml/min*
*Not endorsed by NICE as a primary prevention agent; but may be particularly appropriate in PD*
6-monthly sc Denosumab (5+ years) *if first line agents contra-indiacted/not tolerated and eGFR>15ml/min*
*Can be used for primary prevention if T-score ≤3.5 with independent clinical risk factors*
Daily sc Teriparatide (2 years) named patient basis only
*Not endorsed by NICE as a primary preventative agent*

**Cautions**
Oral bisphosphonates contraindicated if eGFR<30; IV bisphosphonates if GFR<35
Denosumab can be given if eGFR>15, but once eGFR<30 increased risk of hypocalcaemia (monitor levels)
Strontium ranelate is no longer recommended for treatment of osteoporosis

**Review of treatment**
Royal National Hospital for Rheumatic Diseases length of treatment recommendations
www.rnhrd.nhs.uk/page/99

**Age Ageing. 2015; 44(1):34-41.** Dr Veronica Lyell. Updated February 2016.

# Links to useful resources and guidelines

| Resources and Guidelines for Falls in Parkinson's | |
|---|---|
| **Useful Papers** | |
| Consensus-based clinical practice recommendation for the examination and management of falls in patients with Parkinson's | www.movementdisorders.org/MDS-Files1/Education/PDFs/2nd-Annual-Allied-Health-Professionals-Summer-School-2014/BloemLecture3-1vanderMarck_PRD2014fallstaskforce.pdf Parkinsonism & Rel Disorders 20(2014):360-69. Van der Marck et al |
| Recurrent Falls in Parkinson's Disease: a systematic review | www.ncbi.nlm.nih.gov/pmc/articles/PMC3606768/ Parkinsons Dis. 2013; 2013: 906274. Allen, Schwarzel, Canning. |
| Freezing of Gait | Freezing of gait: a practical approach to management. Lancet Neurol 2015; 14: 768–78. Nonnekes, Snijders, Nutt, Deuschl, Giladi, Bloem. |
| **NICE Guidelines** | |
| Falls in older people: assessing risk and prevention (CG161) | www.nice.org.uk/guidance/cg161 |
| Parkinson's Disease (CG35) | www.nice.org.uk/guidance/cg35 *NB Currently being updated.* |
| **Physiotherapy** | |
| Parkinson's UK. Quick reference cards for Physiotherapists | www.parkinsons.org.uk/sites/default/files/publications/download/english/quickreferencecards_physio.pdf |
| Falls Prevention Exercise: following the evidence (Age UK) | www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/Falls_Prevention_Guide_2013.pdf?dtrk=true |
| Register (free) to receive European PT guidelines | www.parkinsonnet.info/euguideline |
| **Occupational Therapy** | |
| Occupational therapy for people with Parkinson's. Best Practice Guidelines. | www.parkinsons.org.uk/sites/default/files/publications/download/english/otparkinsons_guidelines.pdf College of Occupational Therapists/Parkinson's UK |
| Occupational Therapy in the Prevention and management of falls in adults. | www.cot.co.uk/sites/default/files/publications/public/Falls-guideline.pdf Practice guideline. College of Occupational Therapists. |
| **Patient Information** | |
| Parkinson's UK information leaflet for patients with falls | www.parkinsons.org.uk/sites/default/files/publications/download/english/fs39_fallsandparkinsons.pdf |
| Staying Steady (Age UK) | www.ageuk.org.uk/Documents/EN-GB/Information-guides/AgeUKIG14_staying_steady_inf.pdf?dtrk=true |
| **Pharmacy / Medicines & Falls** | |
| Guidance regarding medicines & falls | https://www.rcplondon.ac.uk/guidelines-polciy/fallsafe-resources-original then choose Guidance sheet medicines and falls in hospital |

## References

In addition to the resources cited and links provided within body of document:


1. Allen NE, Schwarzel AK, Canning CG. Recurrent falls in Parkinson's disease: a systematic review. *Park Dis* 2013; 2013: 906274.
2. Tornsey KM, Noyce AJ, Doherty KM et al. Bone health in Parkinson's Disease: a systematic review and meta-analysis. *J Neurol Neurosurg Psychiatry*. Published Online First [March 21, 2014] doi:10.1136/jnnp-2013-307307.
3. Pouwels S, Bazelier MT, Boer A et al. Risk of fracture in patients with Parkinson's disease. *Osteoporosis Int* 2013 Aug; 24(8):2283-90. doi: 10.1007/s00198-013-2300-2.
4. Henderson, Emily. Falls in Parkinson's Disease. Powerpoint presentation at Britmodis Conference, Birmingham 29th 2016. Contents of slide reproduced with permission.
5. Van der Marck MA, Klok MP, Okun MS et al. Consensus-based clinical recommendations for the examination and management of falls in patients with Parkinson's disease. *Parkinsonism and Related Disorders* 2014; 20:360-369.
6. Lyell V, Henderson E, Devine M, Gregson C. Assessment and management of fracture risk in patients with Parkinson's disease. *Age Ageing* 2015; 44(1):34-41.


## Acknowledgements

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